Chapter 22
Air Quality and Greenhouse Gases

22.1 Affected Environment/Environmental Setting

The Plan Area (the area covered by the BDCP) consists of the Sacramento–San Joaquin River Delta, the Suisun Marsh, the Yolo Bypass, and the Areas of Additional Analysis, as discussed in Chapter 3, *Description of Alternatives,* Section 3.3.1. Sensitive receptors associated with residential and recreational land uses are located in the Plan Area. The potential air quality and greenhouse gas (GHG) effects of the proposed water conveyance facility (Conservation Measure [CM] 1) on these receptors are evaluated quantitatively at the project level, and the effects of CM2–CM21 are evaluated qualitatively at the program level, consistent with the approach described in Chapter 4, *Approach to the Environmental Analysis*, Section 4.1.2.

More reliable water exports could facilitate new growth and development in the State Water Project (SWP) and Central Valley Project (CVP) Export Service Areas). Impacts on air quality associated with this growth are addressed in Chapter 30, *Growth Inducement and Other Indirect Effects,* Section 30.3.3.2.

This section describes existing conditions related to air quality and GHG in the air quality study area (the area in which impacts may occur). It then discusses federal, state, and local regulations related to air quality that would apply to the alternatives. The chapter assesses local and regional air quality impacts associated with criteria pollutants and toxic air contaminants (TAC) generated by construction and operation of the BDCP alternatives. With respect to GHGs, the chapter evaluates the impact of the BDCP alternatives on climate change (i.e., the project's contribution to elevated GHG concentrations in the atmosphere). Potential effects of climate change on specific resources (e.g., land use) are discussed qualitatively for applicable resource topics throughout this document. Resource chapters that rely on CALSIM II/DSM2 modeling results address potential climate change and sea-level rise for the No Action and BDCP alternatives. The ability for the BDCP alternatives to affect the resiliency and adaptability of the Plan Area to the effects of climate change is described in Chapter 29, *Climate Change*.

The study area (i.e., the area in which impacts may occur) for the analysis of air quality effects is the area immediately surrounding and within 1,000 feet of the construction and operational fenceline. The study area for GHGs is much broader due to the global nature of climate change. While the GHG analysis focuses on emissions generated at the project site as a result of construction and operation, the analysis considers potential regional and global GHG effects.

22.1.1 Regional Climate and Meteorology

The primary factors that determine air quality are the locations of air pollutant sources and the amount of pollutants emitted from those sources. Meteorological and topographical conditions are also important—atmospheric conditions, such as wind speed, wind direction, and air temperature gradients, interact with the physical features of the landscape to determine the movement and dispersal of air pollutants. Land use and land management also contribute to microclimates through the absorption and emission of GHG emissions (discussed further below).

California is divided into 15 air basins based on geographic features that create distinctive regional climates. The air quality study area encompasses the following three air basins: Sacramento Valley Air Basin (SVAB), San Joaquin Valley Air Basin (SJVAB), and the San Francisco Bay Area Air Basin (SFBAAB). The following section discusses climate and meteorological information associated with these three basins. Figure 22-1 highlights the three air basins in the study area.

22.1.1.1 Sacramento Valley Air Basin

The SVAB is bounded on the north by the Cascade Range, on the south by the SJVAB, on the east by the Sierra Nevada, and on the west by the Coast Ranges. The SVAB contains all of Tehama, Glenn, Butte, Colusa, Yolo, Sutter, Yuba, Sacramento, and Shasta Counties, as well as a portion of Solano and Placer Counties (CCR § 60106).

The SVAB has a Mediterranean climate characterized by hot, dry summers and cool, rainy winters. During winter, the north Pacific storm track intermittently dominates Sacramento Valley weather, and fair weather alternates with periods of extensive clouds and precipitation. Periods of dense and persistent low-level fog, which is most prevalent between storms, are also characteristic of winter weather in the valley. The frequency and persistence of heavy fog in the valley diminish with the approach of spring. The average yearly temperature range for the Sacramento Valley is 20°F to 115°F, with summer high temperatures often exceeding 90°F and winter low temperatures occasionally dropping below freezing.

In general, the prevailing winds are moderate in strength and vary from moist clean breezes from the south to dry land flows from the north. The mountains surrounding the SVAB create a barrier to airflow that can trap air pollutants under certain meteorological conditions. The highest frequency of air stagnation occurs in the autumn and early winter when large high-pressure cells collect over the Sacramento Valley. The lack of surface wind during these periods and the reduced vertical flow caused by less surface heating reduce the influx of outside air and allow air pollutants to become concentrated in a stable volume of air. The surface concentrations of pollutants are highest when these conditions are combined with temperature inversions (warm air over cool air), which trap pollutants near the ground.

The ozone season (May through October) in the Sacramento Valley is characterized by stagnant morning air or light winds with the Delta sea breeze arriving in the afternoon out of the southwest. Usually the evening breeze transports the airborne pollutants to the north out of the Sacramento Valley. During about half of the days from July to September, however, a phenomenon called the Schultz eddy prevents this from occurring. Instead of allowing the prevailing wind patterns to move north carrying the pollutants out, the Schultz eddy causes the wind pattern to circle back to the south. Essentially, this phenomenon causes the air pollutants to be blown south toward the Sacramento Valley and Yolo County. This phenomenon has the effect of exacerbating the pollution levels in the area and increases the likelihood of violating federal or state standards. The eddy normally dissipates around noon when the Delta sea breeze arrives (Yolo-Solano Air Quality Management District 2007).

22.1.1.2 San Joaquin Valley Air Basin

The SJVAB is bounded by the Sierra Nevada to the east, the Coast Ranges to the west, and the Tehachapi Mountains to the south. The SJVAB contains all of San Joaquin, Stanislaus, Merced, Madera, Fresno, Kings, and Tulare Counties, as well as a portion of Kern County (CCR § 60107).

The area has an inland Mediterranean climate that is characterized by warm, dry summers and cool winters. Summer high temperatures often exceed 100°F, averaging in the low 90s in the northern valley and high 90s in the southern portion.

Although marine air generally flows into the basin from the Delta, the surrounding mountain ranges restrict air movement through and out of the valley. Wind speed and direction influence the dispersion and transportation of pollutants—the more wind flow, the less accumulation.

The vertical dispersion of air pollutants in the SJVAB is limited by the presence of persistent temperature inversion. Due to differences in air density, the air above and below the inversion do not mix. Air pollutants tend to collect under an inversion, leading to higher concentrations of emitted pollutants.

Precipitation and fog tend to reduce pollutant concentrations. Ozone needs sunlight for its formation, and clouds and fog block the required radiation. Precipitation in the San Joaquin Valley decreases from north to south, with approximately 20 inches in the north, 10 inches in the middle, and less than 6 inches in the south (San Joaquin Valley Air Pollution Control District 2002).

22.1.1.3 San Francisco Bay Area Air Basin

The SFBAAB contains all of Napa, Contra Costa, Alameda, Santa Clara, San Mateo, San Francisco, and Marin Counties, as well as a portions of Sonoma and Solano Counties (CCR § 60101). Climate within the SFBAAB is characterized by moderately wet winters and dry summers. Winter rains, which occur in the months of December through March, account for about 75% of the average annual rainfall.

Climate is affected by marine air flow and the basin's proximity to the San Francisco Bay. Bay breezes push air onshore during the daytime and draw air offshore at night. During the summer months, the bay helps to cool the warm onshore flows, while it warms the air during the winter months. This mediating effect keeps temperatures relatively consistent throughout the year. In the westernmost portion of the SFBAAB which encompasses the study area, the bay wind patterns can concentrate and carry air pollutants from other cities to the region, adding to the mix of pollutants that are emitted locally (Bay Area Air Quality Management District 2011).

22.1.2 Background Information on Air Pollutants

22.1.2.1 Criteria Pollutants

The federal and state governments have established national ambient air quality standards (NAAQS) and California ambient air quality standards (CAAQS), respectively, for six criteria pollutants: ozone, carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and particulate matter (PM, which consists of PM10 microns in diameter or less (PM10) and PM 2.5 microns in diameter or less (PM2.5).

Ozone and NO_2 are considered regional pollutants because they (or their precursors) affect air quality on a regional scale; NO_2 reacts photochemically with reactive organic gases (ROG) to form ozone, and this reaction occurs at some distance downwind of the source of pollutants. Pollutants such as CO, SO_2, and Pb are considered to be local pollutants that tend to accumulate in the air locally. Particulate matter is considered to be a local and regional pollutant.

The principal characteristics surrounding the primary criteria pollutants of concern in the study area are discussed below.

Ozone

Ozone is a respiratory irritant that can cause severe ear, nose, and throat irritation and increases susceptibility to respiratory infections. It is also an oxidant that causes extensive damage to plants through leaf discoloration and cell damage. It can cause substantial damage to other materials as well, such as synthetic rubber and textiles.

Ozone is not emitted directly into the air but is formed by a photochemical reaction in the atmosphere. Ozone precursors—ROG and nitrogen oxides (NO_X)—react in the atmosphere in the presence of sunlight to form ozone. Because photochemical reaction rates depend on the intensity of ultraviolet light and air temperature, ozone is primarily a summer air pollution problem. The ozone precursors, ROG and NO_X, are mainly emitted by mobile sources and by stationary combustion equipment.

Hydrocarbons are organic gases that are made up of hydrogen and carbon atoms. There are several subsets of organic gases, including ROGs and volatile organic compounds (VOCs). ROGs are defined by state rules and regulations; VOCs are defined by federal rules and regulations. For the purposes of this assessment, hydrocarbons are classified and referred to as ROGs. Both ROGs and VOCs are emitted from the incomplete combustion of hydrocarbons or other carbon-based fuels, or as a product of chemical processes. The major sources of hydrocarbons are combustion engine exhaust, oil refineries, and oil-fueled power plants; other common sources are petroleum fuels, solvents, dry-cleaning solutions, and paint (through evaporation).

The health effects of hydrocarbons result from the formation of ozone. High levels of hydrocarbons in the atmosphere can interfere with oxygen intake by reducing the amount of available oxygen though displacement. Carcinogenic forms of hydrocarbons are considered TACs. There are no separate health standards for ROGs, although some are also toxic; an example is benzene, which is both an ROG and a carcinogen.

Nitrogen Oxides

Nitrogen oxides are a family of highly reactive gases that are a primary precursor to the formation of ground-level ozone, and react in the atmosphere to form acid rain. Atmospheric reactions with NO_X can also lead to the secondary formation of PM (see below). Nitrogen dioxide, often used interchangeably with NO_X, is a brownish, highly reactive gas that is present in all urban environments. The major human sources of NO_2 are combustion devices, such as boilers, gas turbines, and mobile and stationary reciprocating internal combustion engines. Combustion devices emit primarily nitric oxide (NO), which reacts through oxidation in the atmosphere to form NO_2 (U.S. Environmental Protection Agency 2010). The combined emissions of NO and NO_2 are referred to as NO_X and reported as equivalent NO_2. Because NO_2 is formed and depleted by reactions associated with ozone, the NO_2 concentration in a particular geographical area may not be representative of local NO_X emission sources.

Inhalation is the most common route of exposure to NO_2. Because NO_2 has relatively low solubility in water, the principal site of toxicity is in the lower respiratory tract. The severity of the adverse health effects primarily depends on the concentration inhaled rather than the duration of exposure. An individual may experience a variety of acute symptoms, such as coughing, difficulty breathing, vomiting, headache, and eye irritation during or shortly after exposure. After a period of approximately 4–12 hours, an exposed individual may experience chemical pneumonitis or pulmonary edema with breathing abnormalities, cough, cyanosis, chest pain, and rapid heartbeat. Severe symptomatic NO_2 intoxication after acute exposure has been linked to prolonged respiratory impairment, with such symptoms as chronic bronchitis and decreased lung function (U.S. Environmental Protection Agency 2010).

Carbon Monoxide

CO has little effect on plants and materials, but it can have significant effects on human health. CO is a public health concern because it combines readily with hemoglobin and thus reduces the amount of oxygen transported in the bloodstream. Effects range from slight headaches to nausea to death.

Motor vehicles are the primary source of CO emissions in most areas. In the study area, high CO levels are of greatest concern during the winter, when periods of light winds combine with the formation of ground-level temperature inversions from evening through early morning. These conditions trap pollutants near the ground, reducing the dispersion of vehicle emissions. Moreover, motor vehicles exhibit increased CO emission rates at low air temperatures. Dramatic reductions in CO levels across California, including a 50% decrease in statewide peak CO levels between 1980 and 2004, have been witnessed during the past several decades. These reductions are primarily a result of California Air Resources Board (ARB) requirements for cleaner vehicles, equipment, and fuels (California Air Resources Board 2004:1).

Particulate Matter

Particulate matter pollution consists of very small liquid and solid particles floating in the air, which can include smoke, soot, dust, salts, acids, and metals. Particulate matter less than 10 microns in diameter, about 1/7th the thickness of a human hair, is referred to as PM10. Particulate matter that is 2.5 microns or less in diameter, roughly 1/28th the diameter of a human hair, is referred to as PM2.5. Major sources of PM10 include motor vehicles; wood burning stoves and fireplaces; dust from construction, landfills, and agriculture; wildfires and brush/waste burning; industrial sources; windblown dust from open lands; and atmospheric chemical and photochemical reactions. PM2.5 results from fuel combustion (from motor vehicles, power generation, and industrial facilities), residential fireplaces, and wood stoves. Particulate matter also forms when gases emitted from industries and motor vehicles, such as SO_2, NO_X, and ROG, undergo chemical reactions in the atmosphere.

PM10 and PM2.5 pose a greater health threat than larger-size particles. When inhaled, these tiny particles can penetrate the human respiratory system's natural defenses and damage the respiratory tract. PM10 and PM2.5 can increase the number and severity of asthma attacks, cause or aggravate bronchitis and other lung diseases, and reduce the body's ability to fight infections. Very small particles of substances, such as lead, sulfates, and nitrates, can cause lung damage directly. These substances can be absorbed into the blood stream and cause damage elsewhere in the body; they can also transport absorbed gases such as chlorides or ammonium into the lungs and cause injury. Whereas particles 2.5 to 10 microns in diameter tend to collect in the upper portion of the respiratory system, particles 2.5 microns or less are so tiny that they can penetrate deeper into the lungs and damage lung tissues. Suspended particulates also damage and discolor surfaces on which they settle, and contribute to haze and reduce regional visibility.

Sulfur Oxides

Sulfur oxides are any of several compounds of sulfur and oxygen, of which the most relevant to air quality is SO_2. SO_2 is produced by coal and oil combustion and such stationary sources as steel mills, refineries, and pulp and paper mills. The major adverse health effects associated with SO_2 exposure pertain to the upper respiratory tract. SO_2 is a respiratory irritant that causes the bronchioles to constrict with inhalation at 5 parts per million (ppm) or more. On contact with the moist mucous membranes, SO_2 produces sulfurous acid, which is a direct irritant. Concentration rather than duration of the exposure is an important determinant of respiratory effects. Exposure to high SO_2 concentrations may result in edema of the lungs or glottis and respiratory paralysis.

22.1.2.2 Toxic Air Contaminants

Although NAAQS and CAAQS have been established for criteria pollutants, no ambient standards exist for TACs. Air toxics are generated by a number of sources, including: point sources, such as refineries and industrial plants; mobile sources, such as diesel trucks, ships, and trains; and area sources, such as dry cleaners, gas stations, and auto body shops. Adverse health effects of TACs can be carcinogenic (cancer-causing), short-term (acute) noncarcinogenic, and long-term (chronic) noncarcinogenic. Direct exposure to these pollutants has been shown to cause cancer, birth defects, damage to the brain and nervous system, and respiratory disorders. Toxicity of individual TACs is studied by the California Office of Environmental Health Hazard Assessment (OEHHA), which also issues guidance and methodologies for characterizing health risks from exposure to TACs.

In 1998, following a 10-year scientific assessment process, the ARB identified PM exhaust from diesel-fueled engines—commonly called diesel particulate matter (DPM)—as a TAC Compared to other air toxics ARB has identified, DPM emissions are estimated to be responsible for about 70% of the total ambient air toxics risk (California Air Resources Board 2000:1). DPM emissions from diesel equipment and trucks are the primary TAC of concern associated with the proposed project.

22.1.2.3 Valley Fever

Valley Fever is not an air pollutant, but is a disease caused by inhaling Coccidioides immitis (C. immitis) fungus spores. The spores are found in certain types of soil and become airborne when the soil is disturbed. After the fungal spores have settled in the lungs, they change into a multicellular structure called a spherule. Valley Fever symptoms generally occur within 2 to 3 weeks of exposure. Approximately 60 percent of Valley Fever cases are mild and display flu-like symptoms or no symptoms at all. Of those who are exposed and seek medical treatment, the most common symptoms are fatigue, cough, chest pain, fever, rash, headache, and joint aches. While C. immitis is not typically found in the Sacramento or Bay Area, the fungus is endemic to the Central Valley. (U.S. Geological Survey 2000.)

22.1.3 Background Information on Climate Change and Greenhouse Gas Emissions

22.1.3.1 Climate Change

The phenomenon known as the *greenhouse effect* keeps the atmosphere near the Earth's surface warm enough for the successful habitation of humans and other life forms. Present in the Earth's lower atmosphere, GHGs play a critical role in maintaining the Earth's temperature; GHGs trap some of the long-wave infrared radiation emitted from the Earth's surface that would otherwise escape to space (Figure 22-2). According to Assembly Bill 32 (AB 32), California's Global Warming Solutions Act, GHGs include the following gases: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), perfluorinated carbons (PFCs), sulfur hexafluoride (SF_6), and hydrofluorocarbons (HFCs). State California Environmental Quality Act guidelines (CEQA Guidelines) (§15364.5) also identify these six gases as GHGs.

Sunlight passes through the atmosphere including infrared, visible, and ultraviolet. Some of the sunlight striking the earth is absorbed and converted to heat, which warms the surface. The surface emits infrared radiation to the atmosphere, where some of it is absorbed by GHGs and re-emitted toward the surface; some of the heat is not trapped by GHGs and escapes into space. Human activities that emit additional GHGs to the atmosphere increase the amount of infrared radiation that gets absorbed before escaping into space, thus enhancing the greenhouse effect and amplifying the warming of the earth. (Center for Climate and Energy Solutions 2011.)

Increases in fossil fuel combustion and deforestation have exponentially increased concentrations of GHGs in the atmosphere since the Industrial Revolution. Rising atmospheric concentrations of GHGs in excess of natural levels enhance the greenhouse effect, which contributes to global warming of the earth's lower atmosphere induces large-scale changes in ocean circulation patterns, precipitation patterns, global ice cover, biological distributions, and other changes to the earth system that are collectively referred to as climate change.

The Intergovernmental Panel on Climate Change (IPCC) has been established by the World Meteorological Organization and United Nations Environment Programme to assess scientific, technical, and socioeconomic information relevant to the understanding of climate change, its potential impacts, and options for adaptation and mitigation. The IPCC estimates that the average global temperature rise between the years 2000 and 2100 could range from 1.1° Celsius, with no increase in GHG emissions above year 2000 levels, to 6.4° Celsius, with substantial increase in GHG emissions (Intergovernmental Panel on Climate Change 2007a:97-115). Large increases in global temperatures could have substantial adverse effects on the natural and human environments on the planet and in California.

This chapter addresses the potential GHG emissions of the proposed BDCP. A more extensive discussion of climate change and how the BDCP alternatives affect the study area's resiliency to expected changes in climate can be found in Chapter 29, *Climate Change* Section 29.6. Within the Delta Reform Act Water Code Section 85320 identifies the contents that the EIR portion of this Draft EIR/EIS must include for the BDCP to be considered for inclusion in the Delta Plan prepared by the Delta Stewardship Council. Section 85320(b)(2)(C) of the Water Code directs that the EIR address "[t]he potential effects of climate change*, possible sea level rise up to 55 inches* [140 centimeters], and possible changes in total precipitation and runoff patterns on the conveyance alternatives and habitat restoration activities considered in the [EIR]." (Italics added.). Each resource chapter evaluates how the BDCP alternatives would affect the specific resource in question. In each of these analyses, where the effects of the BDCP alternatives are analyzed at future time periods, climate change is integrated into the analysis. In these analyses, the BDCP alternatives are evaluated using a projection of future climate that includes changes in temperature, precipitation, humidity, hydrology, and sea level rise. These analyses fulfill the requirements for climate change analysis outlined in the Delta Reform Act of 2009 (Cal. Water Code, § 85000 *et seq*.).

22.1.3.2 Principal Greenhouse Gas Emissions Generated by the Alternatives

The primary GHGs generated by the alternatives would be CO_2, CH_4, N_2O, and SF_6. A small amount of HFCs may also be generated by leaking air conditioners in onroad vehicles. Each of these gases is discussed in detail below. Note that PFCs are not discussed as these gases are primarily generated by industrial and manufacturing processes, which are not anticipated as part of the project.

To simplify reporting and analysis, methods have been set forth to describe emissions of GHGs in terms of a single gas. The most commonly accepted method to compare GHG emissions is the global warming potential (GWP) methodology defined in the IPCC reference documents. The IPCC defines the GWP of various GHG emissions on a normalized scale that recasts all GHG emissions in terms of CO_2 equivalent (CO_2e), which compares the gas in question to that of the same mass of CO_2 (CO_2 has a global warming potential of 1 by definition).

Table 22-1 lists the global warming potential of CO_2, CH_4, N_2O, SF_6, and HFCs; their lifetimes; and abundances in the atmosphere.

Table 22-1. Lifetimes and Global Warming Potentials of Several Greenhouse Gases

Greenhouse Gases	Global Warming Potential (100 years)	Lifetime (years)	2014 Atmospheric Abundance
CO_2 (ppm)[a]	1	50–200	394
CH_4 (ppb)	28	9–15	1,893
N_2O (ppb)	265	121	326
SF_6 (ppt)[a]	23,500	3,200	7.8
HFC-23 (ppt)	12,400	222	18
HFC-134a (ppt)	1,300	13.4	75
HFC-152a (ppt)	138	1.5	3.9

Sources: Myhre et al. 2013; Blasing 2014; National Oceanic and Atmospheric Administration 2014.
ppm = parts per million by volume.
ppb = parts per billion by volume.
ppt = parts per trillion by volume.

Carbon Dioxide

CO_2 is the most important anthropogenic GHG and accounts for more than 75% of all GHG emissions caused by humans. Its atmospheric lifetime of 50–200 years ensures that atmospheric concentrations of CO_2 will remain elevated for decades even after mitigation efforts to reduce GHG concentrations are promulgated (Intergovernmental Panel on Climate Change 2007a). The primary sources of anthropogenic CO_2 in the atmosphere include the burning of fossil fuels (including motor vehicles), gas flaring, cement production, and land use changes (e.g., deforestation, oxidation of elemental carbon). CO_2 can also be removed from the atmosphere by photosynthetic organisms.

Atmospheric CO_2 has increased from a pre-industrial concentration of 280 ppm to 394 ppm in 2014 (Intergovernmental Panel on Climate Change 2007b; National Oceanic and Atmospheric Administration 2014).

Methane

CH_4, the main component of natural gas, is the second most abundant GHG and has a GWP of 28 (Myhre et al. 2013). Sources of anthropogenic emissions of CH_4 include growing rice, raising cattle, using natural gas, landfill outgassing, and mining coal. (National Oceanic and Atmospheric Administration 2005). Certain land uses also function as a both a source and sink for CH_4. For example, wetlands are a terrestrial source of CH_4, whereas undisturbed, aerobic soils act as a CH_4 sink (i.e., they remove CH_4 from the atmosphere).

Atmospheric CH_4 has increased from a pre-industrial concentration of 715 ppb to 1,893 ppb in 2014 (Intergovernmental Panel on Climate Change 2007b; Blasing 2014).

Nitrous Oxide

N_2O is a powerful GHG with a GWP of 265 (Myhre et al. 2013). Anthropogenic sources of N_2O include agricultural processes (e.g., fertilizer application), nylon production, fuel-fired power plants, nitric acid production, and vehicle emissions. N_2O also is used in rocket engines, racecars, and as an aerosol spray propellant. Natural processes, such as nitrification and denitrification, can also produce N_2O, which can be released to the atmosphere by diffusion. In the United States (U.S.) more than 70% of N_2O emissions are related to agricultural soil management practices, particularly fertilizer application.

N_2O concentrations in the atmosphere have increased 18% from pre-industrial levels of 270 ppb to 326 ppb in 2014 (Intergovernmental Panel on Climate Change 2007b; Blasing 2014).

Sulfur Hexafluoride

SF_6, a human-made chemical, is used as an electrical insulating fluid for power distribution equipment, in the magnesium industry, in semiconductor manufacturing, and also as a tracer chemical for the study of oceanic and atmospheric processes (U.S. Environmental Protection Agency 2006a). In 2014, atmospheric concentrations of SF_6 were 7.8 parts per trillion (ppt) and steadily increasing in the atmosphere (Blasing 2014). SF_6 is the most powerful of all GHGs listed in IPCC studies, with a GWP of 23,500 (Myhre et al. 2013).

Hydrofluorocarbons

HFCs are human-made chemicals used in commercial, industrial, and consumer products and have high GWPs. HFCs are generally used as substitutes for ozone-depleting substances in automobile air conditioners and refrigerants. Within the transportation sector, HFCs from leaking air conditioning units represent about 3% of total onroad emissions (United States Environmental Protection Agency 2007).

22.1.3.3 Greenhouse Gas Emissions Inventories

A GHG inventory is a quantification of all GHG emissions and sinks within a selected physical and/or economic boundary. GHG inventories can be performed on a large scale (i.e., for global and national entities) or on a small scale (i.e., for a particular building or person). Although many processes are difficult to evaluate, several agencies have developed tools to quantify emissions from certain sources.

Table 22-2 outlines the most recent global, national, statewide, and local GHG inventories to help contextualize the magnitude of potential project-related emissions.

Table 22-2. Global, National, State, and Local GHG Emissions Inventories

Emissions Inventory[a]	CO_2e (metric tons)
2004 IPCC Global GHG Emissions Inventory	49,000,000,000
2012 EPA National GHG Emissions Inventory	6,526,000,000
2012 ARB State GHG Emissions Inventory	458,680,000
2007 SFBAAB GHG Emissions Inventory	95,800,000
2005 Sacramento County GHG Emissions Inventory	12,422,425
2008 Yolo County Unincorporated GHG Emissions Inventory	651,470

Sources: Intergovernmental Panel on Climate Change 2007a; U.S. Environmental Protection Agency 2014a; California Air Resources Board 2014a; ICF International 2012; Bay Area Air Quality Management District 2010; Yolo County 2011.

[a] GHG emissions inventories for Yolo County and the SJVAB are currently unavailable.

22.1.4 Existing Air Quality Conditions

The existing air quality conditions in the study area can be characterized by monitoring data collected in the region. Table 22-3 summarizes data for criteria air pollutant levels from monitoring stations in the SVAB, SJVAB, and SFBAAB for the last 3 years for which complete data are available (2011–2013). Air quality concentrations are expressed in terms of ppm or micrograms per cubic meter ($\mu g/m^3$). As shown in Table 22-3, the monitoring stations have experienced exceedances of the NAAQS and CAAQS for all pollutants except CO and NO_2.

22.1.4.1 Attainment Status

Local monitoring data (Table 22-3) are used to designate areas as nonattainment, maintenance, attainment, or unclassified for the NAAQS and CAAQS. The four designations are further defined as:

- Nonattainment—assigned to areas where monitored pollutant concentrations consistently violate the standard in question.
- Maintenance—assigned to areas where monitored pollutant concentrations exceeded the standard in question in the past but are no longer in violation of that standard.
- Attainment—assigned to areas where pollutant concentrations meet the standard in question over a designated period of time.
- Unclassified—assigned to areas were data are insufficient to determine whether a pollutant is violating the standard in question.

Table 22-4 summarizes the attainment status of the portions of the study area within the SVAB SJVAB, and SFBAAB with regard to the NAAQS and CAAQS.

22.1.5 Sensitive Receptors

The NAAQS and CAAQS apply at publicly accessible areas, regardless of whether those areas are populated. For the purposes of air quality analysis, sensitive land uses are defined as locations where human populations, especially children, seniors, and sick persons, are located and where there is reasonable expectation of continuous human exposure according to the averaging period for the air quality standards (e.g., 24-hour, 8-hour, and 1-hour). Typical sensitive receptors include residences, hospitals, and schools. Please refer to Chapter 23, *Noise,* Section 23.2.3, for additional information on sensitive receptors in the study area.

Table 22-3. Ambient Air Quality Monitoring Data for the SVAB, SJVAB, SFBAAB (2011–2013)

Pollutant Standards	SVAB (T Street & El Camino)			SJVAB (Stockton)			SFBAAB (Bethel Island & Concord)		
	2011	2012	2013	2011	2012	2013	2011	2012	2013
Ozone (O_3)									
Maximum 1-hour concentration (ppm)	0.100	0.104	0.091	0.089	0.097	0.080	0.091	0.098	0.082
Maximum 8-hour concentration (ppm)	0.087	0.092	0.068	0.068	0.083	0.067	0.078	0.087	0.075
Number of days standard exceeded[a]									
CAAQS 1-hour (>0.09 ppm)	1	1	0	0	1	0	0	1	0
CAAQS 8-hour (>0.070 ppm)	5	9	0	0	2	0	4	4	1
NAAQS 8-hour (>0.075 ppm)	1	4	0	0	6	0	2	2	0
Carbon Monoxide (CO)									
Maximum 8-hour concentration (ppm)	2.83	2.14	-	2.13	1.78	-	0.95	0.89	-
Maximum 1-hour concentration (ppm)	3.0	2.7	3.0	3.2	3.0	2.7	1.4	1.5	1.0
Number of days standard exceeded[a]									
NAAQS 8-hour (≥9 ppm)	0	0	0	0	0	0	0	0	0
CAAQS 8-hour (≥9.0 ppm)	0	0	0	0	0	0	0	0	0
NAAQS 1-hour (≥35 ppm)	0	0	0	0	0	0	0	0	0
CAAQS 1-hour (≥20 ppm)	0	0	0	0	0	0	0	0	0
Nitrogen Dioxide (NO_2)									
State maximum 1-hour concentration (ppm)	57	62	59	62	78	62	35	32	33
State second-highest 1-hour concentration (ppm)	53	56	56	59	58	61	34	30	32
Annual average concentration (ppm)	13	12	12	16	14	15	6	6	-
Number of days standard exceeded									
CAAQS 1-hour (0.18 ppm)	0	0	0	0	0	0	0	0	0
Particulate Matter (PM10)[b]									
National[c] maximum 24-hour concentration (µg/m^3)	38.8	36.2	53.1	66.1	69.4	90.1	46.8	51.4	47.4
National[c] second-highest 24-hour concentration (µg/m^3)	38.1	33.6	45.4	53.0	58.2	69.4	44.3	29.5	45.5
State[d] maximum 24-hour concentration (µg/m^3)	42.2	36.7	92.3	70.1	70.0	95.5	49.5	52.3	50.7
State[d] second-highest 24-hour concentration (µg/m^3)	39.3	35.6	66.8	57.8	61.7	74.0	45.8	31.4	48.5
National annual average concentration (µg/m^3)	18.4	17.2	14.4	23.3	22.4	31.3	17.3	13.8	8.5
State annual average concentration (µg/m^3)[e]	19.2	17.8	-	24.1	22.8	32.0	17.9	14.1	-
Number of days standard exceeded[a]									
NAAQS 24-hour (>150 µg/m^3)[f]	0	0	-	0	0	0	0	0	0
CAAQS 24-hour (>50 µg/m^3)[f]	0	0	21	24	18	58	0	6	1

Table 22-3. Continued

	SVAB (T Street & El Camino)			SJVAB (Stockton)			SFBAAB (Bethel Island & Concord)		
Pollutant Standards	2011	2012	2013	2011	2012	2013	2011	2012	2013
Particulate Matter (PM2.5)									
National[c] maximum 24-hour concentration (μg/m^3)	50.5	27.1	39.2	60.0	60.4	65.5	47.5	32.2	36.2
National[c] second-highest 24-hour concentration (μg/m^3)	47.8	26.7	35.9	53.1	45.0	64.4	39.7	30.0	29.5
State[d] maximum 24-hour concentration (μg/m^3)	50.5	40.8	40.2	65.5	60.4	66.5	47.5	32.2	36.2
State[d] second-highest 24-hour concentration (μg/m^3)	47.8	31.1	39.4	59.5	45.0	64.4	39.7	30.0	29.5
National annual average concentration (μg/m^3)	10.1	8.3	10.0	11.3	12.3	17.6	7.8	6.6	7.6
State annual average concentration (μg/m^3)[e]	10.1	-	10.1	14.0	12.4	-	7.9	6.6	7.6
Number of days standard exceeded[a]									
NAAQS 24-hour (>35 μg/m^3)	18	0	6	11	6	28	2	0	1
Sulfur Dioxide (SO_2)									
No data available									

Source: California Air Resources Board 2014b; United States Environmental Protection Agency 2014b.

ppm = parts per million.
NAAQS = National Ambient Air Quality Standards.
CAAQS = California Ambient Air Quality Standards.
μg/m^3 = micrograms per cubic meter.
mg/m^3 = milligrams per cubic meter.
\> = greater than.
NA = not applicable.

[a] An exceedance is not necessarily a violation.
[b] National statistics are based on standard conditions data. In addition, national statistics are based on samplers using federal reference or equivalent methods.
[c] State statistics are based on local conditions data, except in the South Coast Air Basin, for which statistics are based on standard conditions data. In addition, State statistics are based on California approved samplers.
[d] Measurements usually are collected every 6 days.
[e] State criteria for ensuring that data are sufficiently complete for calculating valid annual averages are more stringent than the national criteria.
[f] Mathematical estimate of how many days concentrations would have been measured as higher than the level of the standard had each day been monitored. Values have been rounded.

Table 22-4. Federal and State Attainment Status of the Study Area within the SVAB, SJVAB, and SFBAAB

	SVAB		SJVAB		SFBAAB	
Pollutant	Federal	State	Federal	State	Federal	State
Ozone (8 hr)	N (severe-15)	N[a]	N (extreme)	N	N (marginal)	N
CO	M[a] (moderate)	A/U	M[a] (moderate)	A/U	M[a] (moderate)	A/U
PM10	M[a] (moderate)	N	M (serious)	N	A/U	N
PM2.5	N	N[a]	N	N	N	N

Sources: U.S. Environmental Protection Agency 2014c; California Air Resources Board 2014c.
A/U = Attainment/Unclassified.
CO = Carbon Monoxide
M = Maintenance.
N = Nonattainment.
PM10 = particulate matter 10 microns in diameter or less
PM2.5 = particulate matter 2.5 microns in diameter or less
[a] Applies only to a portion of the air basin that the study area crosses.

22.2 Regulatory Setting

The study area is subject to air quality regulations developed and implemented at the federal, state, and local levels. At the federal level, the U.S. Environmental Protection Agency (EPA) is responsible for implementation of the Clean Air Act (CAA). Some portions of the CAA (e.g., certain mobile-source and other requirements) are implemented directly by EPA. Other portions of the CAA (e.g., stationary-source requirements) are implemented by state and local agencies.

Responsibility for attaining and maintaining air quality in California is divided between ARB and regional air quality districts. Areas of control for the regional districts are set by ARB, which divides the state into air basins. Plans, policies, and regulations relevant to the alternatives are discussed below.

22.2.1 Federal Plans, Policies, and Regulations

The following federal regulations related to air quality may apply to implementation of some aspects of the BDCP water conveyance facility and the conservation measures. The regulations act as performance standards for engineers and construction contractors; their implementation is considered an environmental commitment of the agencies implementing the BDCP. This commitment is discussed further in Appendix 3B, *Environmental Commitments.*

22.2.1.1 Criteria Pollutants

Clean Air Act and National Ambient Air Quality Standards

The federal CAA, promulgated in 1963 and amended several times thereafter, including the 1990 Clean Air Act amendments (CAAA), establishes the framework for modern air pollution control. The act directs the EPA to establish NAAQS for the six criteria pollutants (discussed in Section 22.1.2). The NAAQS are divided into primary and secondary standards; the former are set to protect human health within an adequate margin of safety, and the latter to protect environmental values, such as plant and animal life. Table 22-5 summarizes the NAAQS.[1]

The CAA requires states to submit a state implementation plan (SIP) for areas in nonattainment for federal standards. The SIP, which is reviewed and approved by EPA, must demonstrate how the federal standards would be achieved. Failing to submit a plan or secure approval can lead to denial of federal funding and permits. In cases where the SIP is submitted by the state but fails to demonstrate achievement of the standards, EPA is directed to prepare a federal implementation plan.

[1] Table 22-5 presents all adopted NAAQS and CAAQS for reference and context. As discussed in Section 22.1.2.1, the pollutants of concern in the air quality study area and generated by the project are ozone precursors (ROG and NO_X), CO, PM2.5, PM10, and SO_X. Accordingly, this EIR/EIS focuses on these pollutants.

Table 22-5. National and California Ambient Air Quality Standards

Pollutant	Symbol	Average Time	Standard (ppm) California	Standard (ppm) National	Standard (μg/m³) California	Standard (μg/m³) National	Violation Criteria California	Violation Criteria National
Ozone*	O_3	1 hour	0.09	–	180	–	If exceeded	–
		8 hours	0.070	0.075	137	147	If exceeded	If fourth-highest 8-hour concentration in a year, averaged over 3 years, is exceeded at each monitor in an area
Carbon monoxide	CO	8 hours	9.0	9	10,000	10,000	If exceeded	If exceeded on more than 1 day per year
		1 hour	20	35	23,000	40,000	If exceeded	If exceeded on more than 1 day per year
(Lake Tahoe only)		8 hours	6	–	7,000	–	If equaled or exceeded	–
Nitrogen dioxide	NO_2	Annual arithmetic mean	0.030	0.053	57	100	If exceeded	If exceeded on more than 1 day per year
		1 hour	0.18	0.100	339	188	If exceeded	–
Sulfur dioxide	SO_2	24 hours	0.04	0.14	105	365	If exceeded	–
		1 hour	0.25	0.075	655	196	If exceeded	If exceeded on more than 1 day per year
		3 hours	–	0.50*	–	1,300*	–	–
		Annual arithmetic mean	–	0.030	–	80	–	If exceeded on more than 1 day per year
Hydrogen sulfide	H_2S	1 hour	0.03	–	42	–	If equaled or exceeded	–
Vinyl chloride	C_2H_3Cl	24 hours	0.01	–	26	–	If equaled or exceeded	–
Inhalable particulate matter	PM10	Annual arithmetic mean	–	–	20	–	–	–
		24 hours	–	–	50	150	If exceeded	If exceeded on more than 1 day per year
	PM2.5	Annual arithmetic mean	–		12	12.0	–	If 3-year average from single or multiple community-oriented monitors is exceeded
		24 hours	–	–	–	35	–	If 3-year average of 98th percentile at each population-oriented monitor in an area is exceeded
Sulfate particles	SO_4	24 hours	–	–	25	–	If equaled or exceeded	–
Lead particles	Pb	Calendar quarter	–	–	–	1.5	–	If exceeded no more than 1 day per year
		30-day average	–	–	1.5	–	If equaled or exceeded	–
		Rolling 3-month average	–	–	–	0.15	If equaled or exceeded	Averaged over a rolling 3-month period

Source: California Air Resources Board 2013.
* = secondary standard.
ppm = parts per million.
μg/m³ = micrograms per cubic meter.

General Conformity Regulation

EPA enacted the federal General Conformity regulation (40 CFR Parts 5, 51, and 93) in 1993. The purpose of the General Conformity rule is to ensure that federal actions do not generate emissions that interfere with state and local agencies' SIPs and emission-reduction strategies to ensure attainment of the NAAQS.

The General Conformity rule applies to all federal actions located in nonattainment and maintenance areas that are not exempt from General Conformity (are either covered by Transportation Conformity or listed in the rule), are not covered by a Presumed-to-Conform approved list[2], or do not have clearly *de minimis* emissions. In addition, the General Conformity rule applies only to direct and indirect emissions associated with the portions of any federal action that are subject to New Source Review (i.e., do not include stationary industrial sources requiring air quality permits from local air pollution control agencies) for which a federal permitting agency has directly caused or initiated, has continued program responsibility for, or can practically control. Because of the involvement of the Bureau of Reclamation (Reclamation), U.S. Fish and Wildlife Service (USFWS), and National Marine Fisheries Service (NMFS), all direct and indirect emissions generated by the construction and operation are subject to General Conformity.

The alternatives would generate air pollutant emissions from activities located within the SVAB, SJVAB, and SFBAAB. As shown in Table 22-4, one or more of these basins is classified as a federal nonattainment and/or maintenance area with respect to ozone, CO, PM10, and PM2.5. Consequently, a conformity evaluation must be undertaken to determine whether all emission sources (e.g., haul trucks, off-road equipment) that operate on BDCP components are subject to the General Conformity rule. Because the alternatives are neither exempt nor presumed to conform and are not subject to transportation conformity, the evaluation of whether the alternatives are subject to the General Conformity rule is made by comparing all annual emissions to the applicable General Conformity *de minimis* thresholds (Tables 22-6 and 22-7). If the conformity evaluation indicates that emissions are in excess of any of the General Conformity *de minimis* thresholds, the applicant must perform a conformity determination. A conformity determination is made by satisfying any of the following requirements.

- Showing that the emission increases caused by the federal action are included in the SIP.
- Demonstrating that the State agrees to include the emission increases in the SIP.
- Offsetting the action's emissions in the same or nearby area.
- Mitigating to reduce the emission increase.
- Utilizing a combination of the above strategies.

[2] Category of activities designated by a Federal agency as having emissions below *de minimis* levels or otherwise do not interfere with the applicable SIP or the attainment and maintenance of the national ambient air quality standard.

Table 22-6. Federal *de minimis* Threshold Levels for Criteria Pollutants in Nonattainment Areas (tons per year)

Pollutant	Emission Rate (tons per year)
Ozone (ROG/VOC or NO_X)	
Serious nonattainment areas	50
Severe nonattainment areas	25
Extreme nonattainment areas	10
Other ozone nonattainment areas outside an ozone transport region[1]	100
Other ozone nonattainment areas inside an ozone transport region[1]	
ROG/VOC	50
NO_X	100
CO: All nonattainment areas	100
SO_2 or NO_2: All nonattainment areas	100
PM10	
Moderate nonattainment areas	100
Serious nonattainment areas	70
PM2.5	
Direct emissions	100
SO_2	100
NO_X (unless determined not to be a significant precursor)	100
ROG/VOC or ammonia (if determined to be significant precursors)	100
Pb: All nonattainment areas	25

Source: 40 CFR 93.153.

Notes: *de minimis* threshold levels for conformity applicability analysis.

Ozone Transport Region consists of the states of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, the Consolidated Metropolitan Statistical Area that includes the District of Columbia and northern Virginia (Section 184 of the Clean Air Act).

Underlined text indicates pollutants for which the region is in non-attainment, and a conformity evaluation must be made.

Table 22-7. Federal *de minimis* Threshold Levels for Criteria Pollutants in Maintenance Areas (tons per year)

Pollutant	Emission Rate (tons per year)
Ozone (NO_X, SO_2, or NO_2)	
All maintenance areas	100
Ozone (ROG/VOC)	
Maintenance areas inside an ozone transport region[1]	50
Maintenance areas outside an ozone transport region[1]	100
CO: All maintenance areas	100
PM10: All maintenance areas	100
PM2.5	
Direct emissions	100
SO_2	100
NO_X (unless determined not to be a significant precursor)	100
ROG/VOC or ammonia (if determined to be significant precursors)	100
Pb: All maintenance areas	25

Source: 40 CFR 93.153.

Notes: *de minimis* threshold levels for conformity applicability analysis.

Ozone Transport Region consists of the states of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, the Consolidated Metropolitan Statistical Area that includes the District of Columbia and northern Virginia (Section 184 of the Clean Air Act).

Underlined text indicates pollutants for which the region is in maintenance, and a conformity determination must be made.

In the event that emissions associated with the alternatives exceed the General Conformity *de minimis* thresholds, the BDCP proponents will consult with the local applicable air quality management or pollution control district to ensure conformity determination is made.

Federal Tailpipe Emission Standards

To reduce emissions from off-road diesel equipment, onroad diesel trucks, and harbor craft, EPA established a series of increasingly strict emission standards for new engines. New construction equipment used for the project, including heavy-duty trucks, off-road construction equipment, tugboats, and barges, will be required to comply with the emission standards.

22.2.1.2 Greenhouse Gases

Mandatory Greenhouse Gas Reporting Rule (2009)

On September 22, 2009, EPA released its final Greenhouse Gas Reporting Rule (Reporting Rule). The Reporting Rule is a response to the fiscal year (FY) 2008 Consolidated Appropriations Act (H.R. 2764; Public Law 110-161), which required EPA to develop “mandatory reporting of greenhouse gasses above appropriate thresholds in all sectors of the economy…” The Reporting Rule would apply to most entities that emit 25,000 metric tons of CO_2e or more per year. Starting in 2010, facility owners are required to submit an annual GHG emissions report with detailed calculations of facility GHG emissions. The Reporting Rule also would mandate recordkeeping and administrative requirements in order for EPA to verify annual GHG emissions reports.

Environmental Protection Agency Endangerment and Cause or Contribute Findings (2009)

On December 7, 2009, EPA signed the Endangerment and Cause or Contribute Findings for Greenhouse Gases under Section 202(a) of the CAA. Under the Endangerment Finding, EPA finds that the current and projected concentrations of the six key well-mixed GHGs—CO_2, CH_4, N_2O, PFCs, SF_6, and HFCs—in the atmosphere threaten the public health and welfare of current and future generations. Under the Cause or Contribute Finding, EPA finds that the combined emissions of these well-mixed GHGs from new motor vehicles and new motor vehicle engines contribute to the GHG pollution that threatens public health and welfare. However, unlike some criteria pollutants and TAC, GHG emissions do not directly impact human health. Rather, as stated in Section 22.1.3.1, elevated GHG concentrations in excess of natural levels induce large-scale climate shifts, which can expose individuals to increased public health risks. For example, increases in ambient temperature can lead to heat-related illnesses and death, whereas changes in disease vectors may lead to increased risk of infectious diseases. Climate change and air pollution are also closely coupled. Ozone and particulate pollution, both of which can negatively impact human health, are strongly influenced by weather and can be concentrated near Earth's surface during extreme heat events.

These findings do not themselves impose any requirements on industry or other entities. However, this action is a prerequisite to finalizing EPA's proposed new corporate average fuel economy standards for light-duty vehicles, which EPA proposed in a joint proposal including the Department of Transportations proposed corporate average fuel-economy standards.

Climate Change Considerations in Project-Level NEPA Analysis (2009)

This document provides initial Forest Service guidance on how to consider climate change and GHG emissions in project-level NEPA documents. While the guidance focuses on how Forest Service management may influence climate change, the document describes scoping issues related to GHG analyses and identifies models that can be used to quantify GHG emissions from Forest Service projects. The guidance will be revised as more scientific literature is published, climate change management experience is gained, and government policies are established.

CEQs Draft NEPA Guidance on Consideration of the Effects of Climate Change and Greenhouse Gas Emissions (2010 and 2014)

On February 19, 2010, the Council on Environmental Quality (CEQ) issued draft National Environmental Policy Act (NEPA) guidance on the consideration of the effects of climate change and GHG emissions. This guidance advises federal agencies that they should consider opportunities to reduce GHG emissions caused by federal actions, adapt their actions to climate change effects throughout the NEPA process, and address these issues in their agency NEPA procedures. Where applicable, the scope of the NEPA analysis should cover the GHG emissions effects of a proposed action and alternative actions, as well as the relationship of climate change effects on a proposed action or alternatives. The guidance identified a reference point of 25,000 metric tons per year of direct CO_2e as an indicator that further NEPA review may be warranted. This reference point, however, is not intended to be used as a threshold for determining a significant impact or effect on the environment due to GHG emissions. (Council on Environmental Quality 2010).

The draft guidance was updated in 2014 to further refine the scope of NEPA analyses. The 2014 guidance recommends that analyses should include the potential effects of a proposed action on climate change as indicated by its GHG emissions, as well as the implication of climate change for the environmental effects of the proposed action (Council on Environmental Quality 2014). The 2014 CEQ guidance is still considered draft as of the writing of this document and is not an official CEQ policy document.

Executive Order B-30-15, Brown (2015)

EO B-30-15 established a medium-term goal for 2030 of reducing GHG emissions by 40 percent below 1990 levels and requires ARB to update its current AB32 Scoping Plan to identify the measures to meet the 2030 target. The executive order supports EO S-3-05, described above, but is only currently binding on state agencies. However, there are current (2015) proposals at the state legislature to adopt a legislative target for 2050 and to give the ARB the authority to adopt interim and long-term binding GHG targets.

22.2.2 State Plans, Policies, and Regulations

The following state regulations related to air quality may apply to implementation of some aspects of the BDCP water conveyance facility and the conservation measures. The regulations act as performance standards for engineers and construction contractors; their implementation is considered an environmental commitment of the agencies implementing the BDCP. This commitment is discussed further in Appendix 3B, *Environmental Commitments.*

22.2.2.1 Criteria Pollutants

California Clean Air Act and California Ambient Air Quality Standards

In 1988, the state legislature adopted the California Clean Air Act (CCAA), which established a statewide air pollution control program. CCAA requires all air districts in the state to endeavor to meet the CAAQS by the earliest practical date. Unlike the federal CAA, the CCAA does not set precise attainment deadlines. Instead, the CCAA establishes increasingly stringent requirements for areas that will require more time to achieve the standards. CAAQS are generally more stringent than the NAAQS and incorporate additional standards for SO_4, H_2S, and C_2H_3Cl, and visibility-reducing particles. The CAAQS and NAAQS are listed together in Table 22-5.

ARB and local air districts bear responsibility for achieving California's air quality standards, which are to be achieved through district-level air quality management plans that would be incorporated into the SIP. In California, EPA has delegated authority to prepare SIPs to ARB, which, in turn, has delegated that authority to individual air districts. ARB traditionally has established state air quality standards, maintaining oversight authority in air quality planning, developing programs for reducing emissions from motor vehicles, developing air emission inventories, collecting air quality and meteorological data, and approving SIPs.

The CCAA substantially adds to the authority and responsibilities of air districts. The CCAA designates air districts as lead air quality planning agencies, requires air districts to prepare air quality plans, and grants air districts authority to implement transportation control measures. The CCAA also emphasizes the control of "indirect and area-wide sources" of air pollutant emissions. The

CCAA gives local air pollution control districts explicit authority to regulate indirect sources of air pollution and to establish traffic control measures (TCMs).

Statewide Truck and Bus Regulation

Originally adopted in 2005, the onroad truck and bus regulation requires heavy trucks to be retrofitted with PM filters. The regulation applies to privately and federally owned diesel fueled trucks with a gross vehicle weight rating (GWR) greater than 14,000 pounds. Compliance with the regulation can be reached through one of two paths: 1) vehicle retrofits according to engine year or 2) phase-in schedule. Both compliance paths ensure that by January 2023, nearly all trucks and buses will have 2010 model year engines or newer.

State Tailpipe Emission Standards

To reduce emissions from off-road diesel equipment, onroad diesel trucks, and harbor craft, ARB established a series of increasingly strict emission standards for new engines. New construction equipment used for the project, including heavy duty trucks, off-road construction equipment, tugboats, and barges, will be required to comply with the standards.

State Nitrogen Oxide Reduction Program

The Carl Moyer Memorial Air Quality Standards Attainment Program (Carl Moyer Program) is a voluntary program that offers grants to owners of heavy-duty vehicles and equipment. The program is a partnership between ARB and the local air districts throughout the state to reduce air pollution emissions from heavy-duty engines. Locally, the air districts administer the Carl Moyer Program.

22.2.2.2 Toxic Air Containments

California regulates TACs primarily through the Tanner Air Toxics Act (AB 1807) and the Air Toxics Hot Spots Information and Assessment Act of 1987 (AB 2588). In the early 1980s, the ARB established a statewide comprehensive air toxics program to reduce exposure to air toxics. The Toxic Air Contaminant Identification and Control Act (AB 1807) created California's program to reduce exposure to air toxics. The Air Toxics "Hot Spots" Information and Assessment Act (AB 2588) supplements the AB 1807 program by requiring a statewide air toxics inventory, notification of people exposed to a significant health threat, and facility plans to reduce these hazards.

In September 2000, the ARB approved a comprehensive diesel risk reduction plan to reduce emissions from both new and existing diesel-fueled engines and vehicles (California Air Resources Board 2000). The goal of the plan was to reduce diesel PM10 (respirable particulate matter) emissions and the associated health threat by 75% in 2010 and by 85% by 2020. The plan identifies 14 measures that target new and existing onroad vehicles (e.g., heavy-duty trucks and buses), off-road equipment (e.g., graders, tractors, forklifts, sweepers, and boats), portable equipment (e.g., pumps), and stationary engines (e.g., stand-by power generators). ARB will implement the plan over the next several years. The Tanner Act sets forth a formal procedure for the ARB to designate substances as TACs. This includes research, public participation, and scientific peer review before the ARB designates a substance as a TAC. To date, the ARB has identified 21 TACs, and has also adopted the EPA's list of HAPs as TACs. In August 1998, DPM was added to the ARB list of TACs (California Air Resources Board 1998).

The Hot Spots Act requires that existing facilities that emit toxic substances above specified levels complete the following.

- Prepare a toxic emission inventory.
- Prepare a risk assessment if emissions are significant (i.e., 10 tons per year or on District's Health Risk Assessment [HRA] list).
- Notify the public of significant risk levels.
- Prepare and implement risk reduction measures.

The ARB has adopted several regulations that will reduce diesel emissions from in-use vehicles and engines throughout California. For example, ARB adopted an idling regulation for onroad diesel-fueled commercial vehicles in July 2004 and updated in October 2005. The regulation applies to public and privately owned trucks with a GWR greater than 10,000 pounds. Vehicles subject to the regulation are prohibited from idling for more than 5 minutes in any one location. ARB also adopted a regulation for diesel-powered construction and mining vehicles operating. Fleet owners are subject to retrofit or accelerated replacement/repower requirements for which ARB must obtain authorization from EPA prior to enforcement. The regulation also imposes a five minute idling limitation on owners, operators, and renters or lessees of off-road diesel vehicles. In some cases, the particulate matter reduction strategies also reduce smog-forming emissions such as NO_X. As an ongoing process, the ARB reviews air contaminants and identifies those that are classified as TACs. The ARB also continues to establish new programs and regulations for the control of TACs, including DPMs, as appropriate.

22.2.2.3 Greenhouse Gases

Executive Order S-3-05 (2005)

Signed by Governor Arnold Schwarzenegger on June 1, 2005, Executive Order S-3-05 asserts that California is vulnerable to the effects of climate change. To combat this concern, Executive Order S-3-05 established the following GHG emissions reduction targets for state agencies.

- By 2010, reduce GHG emissions to 2000 levels.
- By 2020, reduce GHG emissions to 1990 levels.
- By 2050, reduce GHG emissions to 80% below 1990 levels.

Executive orders are binding only on state agencies. Accordingly, EO S-03-05 will guide state agencies' efforts to control and regulate GHG emissions but will have no direct binding effect on local government or private actions. The Secretary of the California Environmental Protection Agency (CalEPA) is required to report to the Governor and state legislature biannually on the impacts of global warming on California, mitigation and adaptation plans, and progress made toward reducing GHG emissions to meet the targets established in this executive order.

Senate Bills 1078/107/2 and Executive Order S-14-08—Renewables Portfolio Standard (2002, 2006,2011)

Senate Bills (SB) 1078 and 107, California's Renewables Portfolio Standard (RPS), obligates investor-owned utilities (IOUs), energy service providers (ESPs), and Community Choice Aggregations (CCAs) to procure an additional 1% of retail sales per year from eligible renewable sources until 20% is reached, no later than 2010. The California Public Utilities Commission (CPUC) and California Energy Commission (CEC) are jointly responsible for implementing the program. EO S-14-08 set forth a longer range target of procuring 33% of retail sales by 2020. SB 2 (2011) requires a RPS of 33% by 2020.

Assembly Bill 1493—Pavley Rules (2002, Amendments 2009)

Known as "Pavley I," AB 1493 standards are the nation's first GHG standards for automobiles. AB 1493 requires the ARB to adopt vehicle standards that will lower GHG emissions from new light duty autos to the maximum extent feasible beginning in 2009. Additional strengthening of the Pavley standards (referred to previously as "Pavley II", now referred to as the "Advanced Clean Cars" measure) has been proposed for vehicle model years 2017–2020. Together, the two standards are expected to increase average fuel economy to roughly 43 miles per gallon by 2020 and reduce GHG emissions from the transportation sector in California by approximately 14%. In June 2009, the EPA granted California's waiver request enabling the state to enforce its GHG emissions standards for new motor vehicles beginning with the current model year.

The EPA and ARB are currently working together to on a joint rulemaking to establish GHG emissions standards for 2017 to 2025 model-year passenger vehicles. The Interim Joint Technical Assessment Report for the standards evaluated four potential future standards ranging from 47 and 62 miles per gallon in 2025. The EPA and ARB were still working on this proposal as of February 2012.

Assembly Bill 32, California Global Warming Solutions Act (2006)

In September 2006, the California State Legislature adopted Assembly Bill 32, the California Global Warming Solutions Act of 2006 (AB 32). AB 32 establishes a cap on statewide GHG emissions and sets forth the regulatory framework to achieve the corresponding reduction in statewide emission levels. Under AB 32, ARB is required to take the following actions.

- Adopt early action measures to reduce GHGs.
- Establish a statewide GHG emissions cap for 2020 based on 1990 emissions.
- Adopt mandatory reporting rules for significant GHG sources.
- Adopt a scoping plan indicating how emission reductions would be achieved through regulations, market mechanisms, and other actions.
- Adopt regulations needed to achieve the maximum technologically feasible and cost-effective reductions in GHGs.

Executive Order S-01-07, Low Carbon Fuel Standard (2007)

Executive Order S-01-07 mandates: (1) that a statewide goal be established to reduce the carbon intensity of California's transportation fuels by at least 10% by 2020, and (2) that a low carbon fuel standard (LCFS) for transportation fuels be established in California. The executive order initiates a research and regulatory process at ARB. Based on an implementation plan developed by CEC, ARB will be responsible for implementing the LCFS. On December 29, 2011, a federal judge issued a preliminary injunction blocking enforcement of the LCFS, ruling that the LCFS violates the interstate commerce clause (Georgetown Climate Center 2012). CARB has appealed this ruling.

Executive Order S-13-08, Adaptation to Climate Change (2008)

Executive Order S-13-08, issued November 14, 2008 directs the California Natural Resources Agency, Department of Water Resources, Office of Planning and Research, Energy Commission, State Water Resources Control Board, State Parks Department, and California's coastal management agencies to participate in a number of planning and research activities to advance California's ability to adapt to the impacts of climate change. The order specifically directs agencies to work with the National Academy of Sciences to initiate the first California Sea Level Rise Assessment and to review and update the assessment every two years after completion; immediately assess the vulnerability of the California transportation system to sea level rise; and to develop a California Climate Change Adaptation Strategy.

Climate Change Scoping Plan (2008)

On December 11, 2008, pursuant to AB 32, ARB adopted the Climate Change Scoping Plan. This plan outlines how emissions reductions from significant sources of GHGs will be achieved via regulations, market mechanisms, and other actions. Six key elements are identified to achieve emissions reduction targets.

- Expanding and strengthening existing energy efficiency programs as well as building and appliance standards.
- Achieving a statewide renewable energy mix of 33%.
- Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system.
- Establishing targets for transportation-related GHG emissions for regions throughout California, and pursuing policies and incentives to achieve those targets.
- Adopting and implementing measures pursuant to existing state laws and policies, including California's clean car standards, goods movement measures, and the Low Carbon Fuel Standard.
- Creating targeted fees, including a public goods charge on water use, fees on high global warming potential gases, and a fee to fund the administrative costs of the state's long-term commitment to AB 32 implementation.

The Climate Change Scoping Plan also describes recommended measures that were developed to reduce GHG emissions from key sources and activities while improving public health, promoting a cleaner environment, preserving our natural resources, and ensuring that the impacts of the reductions are equitable and do not disproportionately affect low-income and minority communities. These measures put the state on a path to meet the long-term 2050 goal of reducing California's GHG emissions to 80% below 1990 levels.

In March 2011, a San Francisco Superior Court enjoined the implementation of ARB's Scoping Plan, finding the alternatives analysis and public review process violated both CEQA and ARB's certified regulatory program (*Association of Irritated Residents, et al v. California Air Resources Board*). In response to this litigation, the ARB adopted a *Final Supplement to the AB 32 Scoping Plan Functional Equivalent Document* on August 24, 2011. ARB staff re-evaluated the statewide GHG baseline in light of the economic downturn and updated the projected 2020 emissions to 507 million metric tons CO_2e. Two reduction measures (Pavley I and the Renewable Portfolio Standard) not previously included in the 2008 Scoping Plan baseline were incorporated into the updated baseline. According to the *Final Supplement*, the majority of additional measures in the Climate Change Scoping Plan have been adopted (as of 2012) and are currently in place (California Air Resources Board 2011a).

California Climate Change Adaptation Strategy (2009)

In cooperation and partnership with multiple state agencies, the 2009 California Climate Adaptation Strategy summarizes the best known science on climate change impacts in seven specific sectors (public health, biodiversity and habitat, ocean and coastal resources, water management, agriculture, forestry, and transportation and energy infrastructure) and provides recommendations on how to manage against those hazards. The California Natural Resources Agency is currently in the process of updating the 2009 strategy for 2012.

State CEQA Guidelines

As revised pursuant to Senate Bill 97 adopted in 2007 (Cal PRC § 21083.05), the State CEQA Guidelines, effective in mid-2010, require lead agencies to describe, calculate, or estimate the amount of GHG emissions that would result from a project. Moreover, the State CEQA Guidelines emphasize the necessity to determine potential climate change effects of the project and propose mitigation as necessary. The State CEQA Guidelines confirm the discretion of lead agencies to determine appropriate significance thresholds, but require the preparation of an S) if "there is substantial evidence that the possible effects of a particular project are still cumulatively considerable notwithstanding compliance with adopted regulations or requirements" (Section 15064.4).

State CEQA Guidelines section 15126.4 includes considerations for lead agencies related to feasible mitigation measures to reduce GHG emissions, which may include, among others, measures in an existing plan or mitigation program for the reduction of emissions that are required as part of the lead agency's decision; implementation of project features, project design, or other measures which are incorporated into the project to substantially reduce energy consumption or GHG emissions; offsite measures, including offsets that are not otherwise required, to mitigate a project's emissions; and, measures that sequester carbon or carbon-equivalent emissions.

Greenhouse Gas Cap-and-Trade Program

On October 20, 2011, ARB adopted the final cap-and-trade program for California. The California cap-and-trade program will create a market-based system with an overall emissions limit for affected sectors. Examples of affected entities include carbon dioxide suppliers, electricity- in-state generators, hydrogen production, petroleum refining, and other large-scale manufacturers and/or fuel suppliers. Neither DWR nor the BDCP are considered covered entities (pursuant to the cap-and-trade regulation) and are therefore not subject to the GHG compliance obligations. However, the program would contribute to emissions reductions in other sectors that could indirectly affect the GHG emission intensity associated with the project (e.g., electricity). The cap-and-trade program is currently proposed to regulate more than 85% of California's emissions and will stagger compliance requirements according to the following schedule: (1) electricity generation and large industrial sources (2012); (2) fuel combustion and transportation (2015).

Technical Advisory Information

This section summarizes two technical advisories on CEQA and climate change. The documents are provided for informational purposes only; certain sections of the below guidance may be superseded by more recent regulations (e.g., SB 97).

Office of Planning and Research Advisory on CEQA and Climate Change

In June 2008, the Office of Planning and Research (OPR) Advisory published a technical advisory entitled “CEQA and Climate Change: Addressing Climate Change through CEQA” (OPR Advisory). This guidance, which is purely advisory, proposes a three-step analysis of GHG emissions. The advice, moreover, is not the most recent expression of state policy on the subject, as it preceded in time the enactment in 2010 of modifications to the CEQA Guidelines addressing how to deal with greenhouse gas emissions in CEQA documents.

1. Mandatory Quantification of GHG Project Emissions. The environmental impact analysis must include quantitative estimates of a project’s GHG emissions from different types of air emission sources. These estimates should include both construction-phase emissions, as well as completed operational emissions, using one of a variety of available modeling tools.[3]
2. Continued Uncertainty Regarding “Significance” of Project-Specific GHG Emissions. Each EIR document should assess the significance of the project’s impacts on climate change. The OPR Advisory recognizes uncertainty regarding what GHG impacts should be determined to be significant and encourages agencies to rely on the evolving guidance being developed in this area. According to the OPR Advisory, the environmental analysis should describe a “baseline” of existing (pre-project) environmental conditions and then add project GHG emissions on to this baseline to evaluate if impacts are significant.
3. Mitigation Measures. According to the OPR Advisory, “all feasible” mitigation measures or project alternatives should be adopted if an impact is significant (feasibility is defined in relation to scientific, technical, and economic factors). If mitigation measures cannot sufficiently reduce project impacts, the agency should adopt those measures that are feasible and include a fact-based explanation in the EIR of why additional mitigation is not feasible. OPR also identifies a menu of GHG emission mitigation measures, ranging from balanced “mixed use” master-planned project designs to construction equipment and material selection criteria and practices. Not all of those mitigation measures apply in every situation.

22.2.2.4 Environmental Justice Compliance and Enforcement Working Group

The California Environmental Protection Agency created the Environmental Justice Compliance and Enforcement Working Group in 2013. The working group coordinates compliance and enforcement of state environmental laws in California communities that are most affected by pollution. Members include the enforcement chiefs from CalEPA, the Department of Toxics Substances Control, the

[3] Note that CEQA Guidelines section 15064.4 supersedes OPR’s 2008 advice on the issue of quantification. Section 15064.4 provides that a lead agency has the discretion to determine, in the context of a particular project, whether to use a model or methodology to quantify greenhouse gas emissions or to rely on a qualitative analysis or performance based standards.

Department of Pesticide Regulation, CalRecycle, the Air Resources Board and the State Water Resources Control Board, as well as a representative from the Office of Environmental Health Hazard Assessment.

22.2.3 Regional and Local Plans, Policies, and Regulations

At the local level, responsibilities of air quality districts include overseeing stationary-source emissions, approving permits, maintaining emissions inventories, maintaining air quality stations, overseeing agricultural burning permits, and reviewing air quality-related sections of environmental documents required by CEQA. The air quality districts are also responsible for establishing and enforcing local air quality rules and regulations that address the requirements of federal and state air quality laws and for ensuring that NAAQS and CAAQS are met.

ARB's Climate Change Scoping Plan states that local governments are "essential partners" in the effort to reduce GHG emissions. The Climate Change Scoping Plan also acknowledges that local governments have "broad influence and, in some cases, exclusive jurisdiction" over activities that contribute to significant direct and indirect GHG emissions through their planning and permitting processes, local ordinances, outreach and education efforts, and municipal operations. Many of the proposed measures to reduce GHG emissions rely on local government actions. The Climate Change Scoping Plan encourages local governments to reduce GHG emissions by approximately 15% from current levels by 2020.

The air quality study area falls under the jurisdiction of four air districts: Yolo-Solano Air Quality Management District (YSAQMD), Sacramento Metropolitan Air Quality Management District (SMAQMD), Bay Area Air Quality Management District (BAAQMD), and San Joaquin Valley Air Pollution Control District (SJVAPCD). The following local policies related to air quality may apply to implementation of some aspects of the BDCP water conveyance facility and the conservation measures. The regulations act as performance standards for engineers and construction contractors; their implementation is considered an environmental commitment of the agencies implementing the BDCP. This commitment is discussed further in Appendix 3B, *Environmental Commitments.*

22.2.3.1 Criteria Pollutants

Yolo-Solano Air Quality Management District

YSAQMD has local air quality jurisdiction over the action components located in Yolo County. YSAQMD has adopted CEQA emission thresholds in the *Handbook for Assessing and Mitigating Air Quality Impacts* (Yolo-Solano Air Quality Management District 2007) to assist lead agencies in determining the level of significance of project-related emissions. According to the YSAQMD handbook, emissions that exceed the recommended threshold levels are considered potentially significant and should be mitigated where feasible.

Under the CCAA, YSAQMD is required to develop an air quality plan for nonattainment criteria pollutants in the air district. The 1994 Sacramento Area Regional Ozone Attainment Plan was prepared to address VOC and NO_X emissions following the region's serious nonattainment designation for the 1-hour ozone NAAQS in November 1991. The Sacramento Regional 8-Hour Attainment and Reasonable Further Progress Plan has also been adopted to address the region's nonattainment status for the 8-hour ozone NAAQS. Air districts within the Sacramento Federal Nonattainment Area (SFNA) have submitted the ozone plan to the EPA and are currently waiting for the agency to approve the document. Counties in the SFNA (Sacramento, Yolo, Placer, El Dorado, Solano, Sutter, and Butte) have also adopted the Northern Sacramento Valley Planning Area 2009 Triennial Air Quality Attainment Plan (2009 Plan) (Sacramento Valley Air Quality Engineering and Enforcement Professionals 2010). This plan outlines strategies to achieve the health-based ozone standard. The Sacramento region is also in the process of developing a plan to address PM.

All activities located in Yolo County are subject to the YSAQMD regulations in effect at the time of construction. Specific regulations applicable to the alternatives may involve diesel construction equipment emissions, fugitive dust, onroad haul truck emissions, and general permit requirements. Below are descriptions of YSAQMD rules that may apply to the project. This list of rules may not be all encompassing as additional YSAQMD rules may apply to the alternatives as specific components are identified.

- Rule 2.5 (Nuisance). This rule prevents dust emissions from creating a nuisance to surrounding properties.
- Rule 2.11 (Particulate Matter Concentration). This rule restricts emissions of PM greater than 0.1 grain per cubic foot of gas at dry standard conditions.
- Rule 2.28 (Cutback and Emulsified Asphalts). This rule limits the application of cutback and emulsified asphalt.
- Rule 2.32 (Stationary Internal Combustion Engines). This rule requires portable equipment greater than 50 horsepower, other than vehicles, to be registered with either ARB Portable Equipment Registration Program (PERP) or with YSAQMD.

Sacramento Metropolitan Air Quality Management District

SMAQMD has local air quality jurisdiction over the action components located in Sacramento County. Similar to YSAQMD, SMAQMD has adopted the 1994 Sacramento Area Regional Ozone Attainment Plan, Sacramento Regional 8-Hour Attainment and Reasonable Further Progress Plan (currently under revision), the 2009 Plan, and advisory CEQA emission thresholds to assist CEQA lead agencies in determining the level of significance of project-related emissions (Sacramento Metropolitan Air Quality Management District 2014). SMAQMD's recommended CEQA thresholds are outlined in its *Guide to Air Quality Assessment in Sacramento County.* The air district also has established rules and regulations, of which the following may apply to the alternatives. This list of rules may not be all encompassing as additional SMAQMD rules may apply to the alternatives as specific components are identified.

- Rule 2020 (Nuisance). This rule prevents criteria pollutants from creating a nuisance to surrounding properties.
- Rule 403 (Fugitive Dust). This rule controls fugitive dust emissions through implementation of BMPs.
- Rule 404 (Particulate Matter). This rule restricts emissions of PM greater than 0.23 grams per cubic meter.
- Rule 412 (Stationary Internal Combustion Engines). This rule controls emissions of NO_X, CO, and non-methane hydrocarbons from stationary internal combustion engines greater than 50 brake horsepower.

- Rule 453 (Cutback and Emulsified Asphalt Paving). This rule limits the application of cutback and emulsified asphalt.

SMAQMD requires development projects implement all feasible mitigation measures to reduce potential impacts to air quality. If traditional, onsite mitigation (e.g., engine retrofits) are not sufficient to reduce adverse impacts, DWR may contribute to SMAQMD's Heavy-Duty Low-Emission Vehicle Incentive Programs (HDLEVIP), which include the Carl Moyer and Sacramento Emergency Clean Air Transportation (SECAT) Programs. The HDLEVIP and associated incentive programs are managed and implemented by the SMAQMD on behalf of all air districts within the SFNA (e.g., YSAQMD, Feather River Air Quality Management District, Placer County Air Pollution Control District). More than $7 million are awarded annually to emissions reduction projects through the HDLEVIP.

The HDLEVIP and associated incentive programs are a means of generating revenue to fund projects and programs capable of achieving emissions reductions. The Carl Moyer program is designed to reduce ROG, NO_X, and PM from on- and offroad sources, whereas the SECAT program primarily targets NO_X from heavy-duty onroad trucks. The payment fee for the Carl Moyer Program is currently $17,720 per ton, in addition to a 5% administration fee. Project applicants relying on the Carl Moyer Program to reduce adverse air quality impacts must 1) calculate the offsite mitigation fee required to reduce project-level emissions to below applicable thresholds, and 2) include the mitigation fee in the environmental document, project approval conditions, and in the MMRP. Fees collected by the SMAQMD are used to fund reduction projects within the SFNA. Example projects funded through the Carl Moyer Program include the following.

- Independent Construction Caterpillar 633D Scraper Tier 2 Engine Repower
- Kiewit Pacific Construction Caterpillar 16G Grader Diesel Catalyst Retrofit
- Commercial Low-Emission Propane Generator
- American Engineering & Asphalt Caterpillar 825C Compactor Tier 2 Engine Repower
- B&D Geerts Construction Caterpillar 826C Compactor Tier 1 Engine Repower

The SECAT program differs from the Carl Moyer Program in that it can only fund projects for on-road vehicles. However, the SECAT program can also finance operational emissions reductions, including facility modifications and out-of-cycle replacements; the Carl Moyer Program is only available to fund the incremental capital costs of control measures.

Bay Area Air Quality Management District

BAAQMD has local air quality jurisdiction over the action components located in Contra Costa and Alameda Counties. Like YSAPCD and SMAQMD, the BAAQMD (2011) has adopted advisory emission thresholds to assist CEQA lead agencies in determining the level of significance of a project's emissions, which are outlined in its *California Environmental Quality Act Air Quality Guidelines*. BAAQMD has also adopted air quality plans to improve air quality, protect public health, and protect the climate The Bay Area 2001 Ozone Attainment Plan was adopted to reduce ozone and achieve the NAAQS ozone standard. BAAQMD also adopted a resignation plan for CO in 1994. The resignation plan includes strategies to ensure the continuing attainment of the NAAQS for CO in the SFBAAB.

The BAAQMD also supports incentive programs to reduce criteria pollutant emissions within the district. Similar to SMAQMD, the BAAQMD's Carl Moyer Program funds control projects for offroad and onroad emission sources. The Transportation Fund for Clean Air (TFCA) Program likewise provides financial incentives for onroad vehicle retrofits.

The alternatives may be subject to the following district rules. This list of rules may not be all encompassing as additional BAAQMD rules may apply to the alternatives as specific components are identified.

- Regulation 2, Rule 5 (New Source Review of Toxic Air Contaminates). This regulation outlines guidance for evaluating TAC emissions and their potential health hazards.
- Regulation 6, Rule 1 (Particulate Matter). This regulation restricts emissions of PM darker than No. 1 on the Ringlemann Chart to less than 3 minutes in any 1 hour.
- Regulation 8, Rule 15 (Emulsified and Liquid Asphalts). This regulation limits emissions of VOCs caused by paving materials.
- Regulation 9, Rule 8 (Stationary Internal Combustion Engines). This regulation limits emissions of NO_X and CO from stationary internal combustion engines of more than 50 horsepower.

San Joaquin Valley Air Pollution Control District

SJVAPCD has local air quality jurisdiction over the action components located in San Joaquin, Stanislaus, and Merced Counties. SJVAPCD's recommended CEQA thresholds are outlined in its *Guide for Assessing and Mitigating Air Quality Impacts.*[4] Pursuant to the CCAA, SJVAPCD has adopted attainment plans to address ozone, PM, and CO. The 2007 Ozone Plan contains a comprehensive list of regulatory and incentive-based measures to reduce VOC and NO_X emissions within the SJVAB. In particular, plan purposes a 75% reduction in NO_X and 25% reduction in VOC by 2023. SJVAPCD's 2007 PM10 Maintenance Plan and 2008 PM2.5 Plan likewise include strategies to reduce PM emissions throughout the air basin. Finally, the 2004 California State Implementation Plan for Carbon Monoxide addresses CO emissions throughout the state.

The alternatives may be subject to the following district rules. This list of rules may not be all encompassing, as additional SJVAPCD rules may apply to the alternatives as specific components are identified. These are rules that have been adopted by SJVAPCD to reduce emissions throughout the San Joaquin Valley.

- Rule 2201 (New and Modified Stationary-Source Review Rule). This rule applies to all new stationary sources and all modifications to existing stationary sources subject to SJVAPCD permit requirements that, after construction, emit or may emit one or more pollutants regulated by the rule.
- Rule 3135 (Dust Control Plan Fees). This rule requires the applicant to submit a fee in addition to a dust control plan. The purpose of this rule is to recover SJVAPCD's cost for reviewing these plans and conducting compliance inspections.

---

[4] SJVAPCD adopted their 2015 GAMAQI on March 19, 2015. Conversation with SJVAPCD staff indicates the SJVAPCD is not requiring the use of their updated 2015 GAMAQI for projects initiated prior to the adoption of the 2015 GAMAQI (Siong Pers. Comm. 2015). Accordingly, this EIR/EIS relies on guidance outlined in the 2002 GAMAQI.

- Rule 4101 (Visible Emissions). This rule prohibits emissions of visible air contaminants to the atmosphere and applies to any source operation that emits or may emit air contaminants.
- Rule 4102 (Nuisance). This rule applies to any source operation that emits or may emit air contaminants or other materials. In the event that the project or construction of the project creates a public nuisance, it could be in violation and subject to SJVAPCD enforcement action.
- Rule 4641 (Cutback, Slow-Cure, and Emulsified Asphalt, Paving, and Maintenance Operations). This rule applies to the manufacture and use of cutback asphalt, slow-cure asphalt, and emulsified asphalt for paving and maintenance operations.
- Rule 4701 (Internal Combustion Engines—Phase 1). This rule limits the emissions of NO_X, CO, and VOC from internal combustion engines. These limits are not applicable to standby engines as long as they are used fewer than 200 hours per year (e.g., for testing during non-emergencies).
- Rule 4702 (Internal Combustion Engines—Phase 2). This rule limits the emissions of NO_X, CO, and VOC from spark-ignited internal combustion engines.
- Regulation VIII (Fugitive PM10 Prohibitions). This is a series of rules (Rules 8011–8081) designed to reduce PM10 emissions (predominantly dust/dirt) generated by human activity, including construction, road construction, bulk materials storage, landfill operations, and other activities.

Similar to SMAQMD, SJVAPCD has developed an offsite mitigation program to reduce ROG and NO_X emissions in the SJVAB. SJVAPCD's Voluntary Emission Reduction Agreement (VERA) is implemented through District Incentive Programs and is a measure to reduce project impacts under CEQA. The District Incentive Programs fund grants and projects to achieve emissions reductions in the SJVAB. The SJVAPCD has operated the program since 1992, resulting in considerable criteria pollutant reductions throughout the region. Project applicants relying on the VERA to reduce adverse air quality impacts must 1) calculate the offsite mitigation fee required to reduce project-level emissions to below applicable thresholds, and 2) include the mitigation fee in the environmental document, project approval conditions, and in the MMRP. Example programs funded through the VERA include the following.

- On-Road Truck Voucher Program
- Burn Clean Program
- Heavy Duty Engine Program
- Cordless Zero-Emission Commercial Lawn & Garden Equipment Demonstration Program
- Statewide School Bus Retrofit Program

22.2.3.2 Greenhouse Gases

Yolo-Solano Air Quality Management District and Sacramento Metropolitan Air Quality Management District

YSAQMD and SMAQMD, along with and a committee of air districts in the Sacramento Region,[5] are developing regional thresholds for evaluating GHG emissions from new stationary source and land development projects. Once fully constructed, the project will not be a land use development or stationary source project. As such, the Sacramento Regional GHG guidance does not directly apply to the proposed project; however, it is described below for context and reference.

While SMAQMD formally adopted the GHG thresholds in November 2014, they are still considered draft in YSAQMD.[6] The GHG thresholds include project categories and emission levels. Construction activities would result in a significant and unavoidable cumulative impact if emissions exceed 1,100 metric tons CO_2e per year. Projects with emissions exceeding the operational threshold must mitigate to 1,100 metric tons CO_2e or demonstrate a 21.7% reduction from a projected no action taken (NAT) scenario to show consistency with AB 32 reduction goals.

Bay Area Air Quality Management District

BAAQMD has adopted recommended significance thresholds for operational GHG emissions from land-use development and stationary source projects. These thresholds are intended to reduce GHG emissions from major contributors within the air district. BAAQMD currently does not recommend a GHG emissions threshold for construction, but encourages the implementation of BMPs (Bay Area Air Quality Management District 2011).

San Joaquin Valley Air Pollution Control District

SVJAPCD's GHG guidance is intended to streamline CEQA review by pre-quantifying emissions reductions that would be achieved through the implementation of best performance standards (BPS). Projects are considered to have a less-than-significant cumulative impact on climate change if any of the following conditions are met.

1. Comply with an approved GHG reduction plan.
4. Achieve a score of at least 29[7] using any combination of approved operational BPS.
5. Reduce operational GHG emissions by at least 29% over business-as usual conditions (demonstrated quantitatively).

---

[5] Air districts in the region include SMAQMD, YSAQMD, El Dorado County Air Quality Management District, Feather River Air Quality Management District, and the Placer County Air Pollution Control District.

[6] The YSAQMD current CEQA Guidelines recommend that lead agencies include at least a qualitative discussion of potential climate change impacts in the air quality analyses of sizable projects. YSAQMD further advises that the lead agency can require mitigation measures such as building code restrictions, increased public transportation, alternative fuels, or other actions that reduce CO_2 (Yolo Solano Air Quality Management District 2007).

[7] A score of 29 represents a 29% reduction in GHG emissions relative to unmitigated conditions (1 point = 1%). This goal is consistent with the reduction targets established by AB 32.

SJVAPCD guidance recommends quantification of GHG emissions for all projects in which an EIR is required, regardless of whether BPS achieve a score of 29 (San Joaquin Valley Air Pollution Control District 2009).

22.3 Environmental Consequences

22.3.1 Methods for Analysis

The effects of the alternatives on air quality, criteria pollutants, and GHG emissions from construction and operations were assessed and quantified using standard and accepted software tools, techniques, and emission factors. A full list of assumptions used to quantify criteria pollutant and GHG emissions can be found in Appendices 22A, *Air Quality Analysis Methodology,* and 22B, *Air Quality Assumptions*.

22.3.1.1 Construction of the Water Conveyance Facility

Mass Emissions Modeling

Construction of the water conveyance facility (CM1) would generate emissions of criteria pollutants (ROG, NO_X, CO, PM10, PM2.5), and GHGs (CO_2, CH_4, N_2O, SF_6, and HFCs) that would result in short-term effects on ambient air quality in the air quality study area. Emissions would originate from off-road equipment exhaust, marine vessel exhaust, tunneling locomotive exhaust, employee and haul truck vehicle exhaust, helicopter exhaust, site grading and earth movement, paving, electrical transmission, and concrete batching. These emissions would be temporary (i.e., limited to the construction period) and would cease when construction activities are completed.

Emissions estimates were based on a combination of project sponsor input and model defaults, as described below. Modeling includes implementation of environmental commitments described in Appendix 3B, *Environmental Commitments*, Sections 3B.5.3 and 3B.5.12.

- **Off-Road Equipment**: Emission factors for diesel-powered off-road construction equipment (e.g., loaders, graders, bulldozers) were obtained from the CalEEMod (version 2013.2.2) User's Guide appendix, which provides values per unit of activity (in grams per horsepower-hour) by calendar year (ENVIRON 2013). Default equipment emission factors for gasoline-powered equipment were obtained from the ARB's OFFROAD2011 model. Criteria pollutant and GHG emissions from off-road equipment were estimated by multiplying the CalEEMod and OFFROAD emission factors by the equipment inventory provided by DWR. Please refer to Appendix 22A, *Air Quality Analysis* and Appendix 22B, *Air Quality Assumptions*, for additional detail and assumptions.
- **Marine Vessels**: Criteria pollutant emissions for marine vessels were quantified based on the ARB's (2012a) *Emissions Estimation Methodology for Commercial Harbor Craft Operating in California* and activity data provided by DWR. GHG emissions were estimated using the DWR activity data and emission factors obtained from the EPA (2009). Please refer to Appendices 22A, *Air Quality Analysis Methodology,* and 22B, *Air Quality Assumptions,* for a catalog of marine vessels.
- **Tunneling Locomotives**: Emissions from diesel-powered locomotives were quantified using the ARB's (2010) off-road diesel engine emission standards. All locomotives were assumed to

utilize a 150 horsepower engine. Please refer to Appendices 22A, *Air Quality Analysis Methodology,* and 22B, *Air Quality Assumptions,* for locomotive operating hours.

- **Helicopters**: Helicopters would be used during line stringing activities for the 115/230 kV transmission lines. Two light-duty helicopters were assumed to operate four hours a day to install new poles and lines. Helicopter emissions were estimated using emission factors from the Federal Aviation Administration's (FAA) Emissions and Dispersion Modeling System (EDMS), version 5.1.4. Please refer to Appendix 22A, *Air Quality Methodology,* for additional modeling information and assumptions.

- **Onroad Vehicles**: Onroad vehicles (e.g., pick-up trucks, flatbed trucks) would be required for material and equipment hauling, tunnel segment hauling, onsite crew and material movement, employee commuting, and as-needed supply and equipment pick-up. Exhaust emissions from onroad vehicles were estimated using the EMFAC2014 emissions model and activity data provided by DWR. Fugitive re-entrained road dust emissions associated with the vehicle trips were estimated using EPA's (2006b; 2011) *Compilation of Air Pollutant Emission Factors* (AP-42), Sections 13.2.1 and 13.2.2. Additional vehicle information can be found in Appendices 22A, *Air Quality Analysis Methodology,* and 22B, *Air Quality Assumptions*.

- **Site Disturbance and Paving**: Fugitive emissions from earth movement (i.e., site grading, bulldozing, and truck loading) and paving were quantified using emission factors from CalEEMod and EPA's (1998) AP-42, Section 11.9. Data on the total graded and paved acreage and quantity of borrow, excavated, and dredged material for each construction phase, as well as the estimated maximum acreage and material that would be disturbed and paved in any one day, were provided by DWR. Please refer to Appendices 22A, *Air Quality Analysis Methodology*, and 22B, *Air Quality Assumptions*, for additional modeling information.

- **Concrete Batching**: Fugitive dust emissions from concrete batching were estimated using concrete data from DWR and emission factors from EPA's AP-42 (2006c) Section 11.12, and SMAQMD's Concrete Batching Operations Policy Manual (2011). CO_2 emissions were calculated based on the compression strength required for specific features and emission factors obtained from Nisbet, Marceau, and VanGeem (2002) and the Slag Cement Association (2013). Additional information on methodology used to quantify PM and CO_2 emissions from concrete batching can be found in Appendix 22A, *Air Quality Analysis Methodology*.

- **Electricity Consumption**: Construction of the water conveyance facility would require the use of electricity for lighting, tunnel ventilation, boring, and certain types of equipment. Annual electric demand for all alternatives was provided by DWR and is summarized Appendix 22B, *Air Quality Assumptions*. Emissions associated with the generation, transmission, and distribution of this electricity were estimated by multiplying the expected annual electricity usage by regional emission factors developed by EPA (2014d)[8] and University of California, Davis (Delucchi 2006:110).

[8] Power will be supplied to BDCP by multiple utilities. The quantity of power supplied by each utility is currently unknown. Consequently, average statewide emission factors, as opposed to utility-specific factors, were used to quantify emissions associated with electricity consumption.

Schedule and Phasing

Construction would occur in multiple phases (e.g., mobilization, land clearing). A detailed construction schedule for the modified pipeline/tunnel alignment was developed based on an economic analysis ("cost estimate") (5RMK, Inc. 2014) provided by DWR. Construction schedules for all other alignments were developed by DWR, based on data developed for the modified pipeline/tunnel alignment. Geotechnical work (modified pipeline/tunnel alignment only) would begin in 2016, following by temporary utilities (all alternatives) in 2017. Construction of CM1 components (e.g., intakes) would begin in 2018. Please refer to Appendix 22B, *Air Quality Assumptions*, for detailed phasing assumptions.

Emissions Scaling

Detailed equipment and vehicle activity assumptions were developed for the modified pipeline tunnel alignment as part of an economic analysis ("cost estimate") (5RMK, Inc. 2014) provided by DWR. A different cost estimate was developed by DWR in 2010 for the pipeline tunnel option and east canal. The assumptions and methodology used in the 2010 cost estimate have since been superseded by the approach utilized to develop the 2014 cost estimate. Accordingly, emissions associated with the pipeline tunnel option and east canal were analyzed using a combination of the 2010 and 2014 cost estimate assumptions, where appropriate, as well as activity scaling factors, as described further in Appendix, 22A, *Air Quality Analysis Methodology.* Emissions generated by the west canal and separate corridors option were analyzed using a similar approach, since cost estimates unique to these alignments were not available at the time of analysis.

Emissions by Air District and Air Basin

The alternatives cross three air basins—SFBAAB, SVAB, and SJVAB—and fall under the jurisdiction of four air districts—YSAQMD, SMAQMD, BAAQMD, and SJVAPCD; each of these have adopted their own distinct local thresholds of significance. To compare project generated emissions to the federal and state thresholds (see below), activities occurring within each air district and air basin were quantified and analyzed separately.[9]

Criteria pollutant and GHG emissions occurring within each air district and air basin were identified based on the location and schedule of construction activities. Construction locations were identified using GIS data provided by DWR and are summarized in Appendix 22A, *Air Quality Analysis Methodology*. Annual emissions estimates were developed by summing emissions that would occur within each year of construction. These emissions were apportioned to each air district based on the location of construction activity. For example, construction of the tunnel in Reach 4 under Alternative 4 would occur in both SMAQMD and SJVAPCD. Emissions generated in each year of construction were calculated using the methods described above. The annual emissions estimates

[9] The ARB acknowledges that air basins in the Plan area, in particular the SJVAB and SVAB, are both contributors and receptors of pollutant transport throughout the state (California Air Resources Board 2009). While technical documents have been published analyzing the transport relationship amongst California air basins, quantifying the effects of pollutant transport as a result of project implementation would require detailed projections of future climatic and meteorological conditions. Air districts in the Plan area have adopted thresholds and mitigation requirements that commensurate with expected criteria air pollutant contributions from downwind air basins (California Air Resources Board 2011b).

were apportioned to SMAQMD and SJVAPCD based on the number of tunnel miles constructed within each air district (see Appendix 22A, *Air Quality Analysis Methodology*).

Emissions from each of the above sources are presented at the daily and annual time scales and compared with the air district construction thresholds and federal *de minimis* thresholds discussed below. Peak daily construction emissions were estimated by calculating emissions for the individual construction phases and then summing emissions from overlapping activities as indicated in the proposed construction schedule (see Appendix 22A). The combination of phases across all locations within a specific air district that produce the highest daily emissions in each construction year was selected as the peak day for impact analysis purposes. This approach is meant to convey a reasonable worst-case scenario, and is therefore not necessarily representative of actual emissions that would be incurred on a daily basis throughout the construction period.

Particulate Matter Dispersion Modeling

A HRA was conducted to assess the potential impacts associated with pollutants of material human health concern. The HRA analyzed the potential human health hazard impacts associated with construction of each of the five BDCP alignments. Construction emissions include DPM generated by diesel fuel combustion from construction equipment engine operation. In addition to analyzing DPM emissions, the HRA also evaluated PM2.5 and PM10 concentrations resulting from both diesel and gasoline combustion, as well as from fugitive dust generation during earthwork activities (referred to as “localized particulate matter”).

The HRA used a four-step approach to evaluate inhalation cancer risks and non-cancer hazards for BDCP construction activities.

- The first step–*hazard identification*–involved identifying the pollutants of most concern. For the HRA, these pollutants were identified as DPM and localized particulate matter (PM2.5 and PM10) (Huss and Dubose pers. comm.; Jones pers. comm. A; Martien pers. comm.; Martien and Lau pers. comm.; Villalvazo, Siong, and Barber pers. comm.).
- The second step–*exposure assessment*–involved estimating the degree of public exposure to DPM and localized particulate emissions associated with construction of the BDCP water conveyance features. In this step, air quality dispersion modeling was performed to estimate DPM, PM2.5, and PM10 concentrations at sensitive receptor locations, which include residences, educational facilities, medical facilities, and parks near each alternative. The air modeling used emission estimates associated with each alternative’s construction activities and hourly meteorological data to estimate the construction-related pollutant concentrations at the receptors within the impact zone.
- The third step–*dose-response evaluation*–involved estimating chronic non-cancer health hazards and cancer risks, based on the concentrations estimated for the sensitive receptor locations in the exposure assessment. This step involved comparing the highest estimated concentrations of DPM in each air district to the non-cancer exposure threshold (the chronic REL) and also using those highest concentrations to estimate the cancer risks for people potentially exposed at those locations. Also in this step, the highest estimated concentrations of PM2.5 and PM10 in each air district were compared to localized PM concentration thresholds, as available.
- The fourth step–*risk characterization*–used the results of the dose-response evaluation to characterize the significance of the health risks posed by each alternative’s DPM and localized particulate matter.

The HRA methodology is consistent with state and local guidance (BAAQMD 2011; OEHHA 2003; 2009; 2012) for HRAs. Moreover, the analysis utilizes conservative exposure-response assumptions to ensure health risks are not understated. Values reported in this document therefore represent evaluation of a worst-case scenario for potential health risks associated with construction of the BDCP water conveyance facilities. Key assumptions and analysis methods for the localized particulate matter and DPM analysis are summarized below. A full list of assumptions can be found in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*.

Localized Particulate Matter Dispersion Modeling

The degree of public exposure to localized particulate matter emissions from project construction was estimated under the exposure assessment portion of the HRA. This portion of the analysis estimated the PM2.5 and PM10 concentrations for sensitive receptors located near the BDCP construction areas. Predicted concentrations were compared to local air district thresholds, as available.

Diesel Particulate Matter Dispersion Modeling

The analysis of DPM health risks is based on guidance and methodologies recommended by the OEHHA (2003; 2009; 2012) and significance thresholds established by the affected air districts. This assessment uses the OEHHA methodology to characterize cancer risks and non-cancer hazards from inhaled DPM.

The degree of public exposure to DPM was estimated under the exposure assessment portion of the HRA. Based on the OEHHA guidance, exhaust emission of PM10 was used as surrogate for DPM as TAC. The analysis was conducted by first estimating the DPM emissions that would be generated by each alternative's construction areas. Then, air quality dispersion modeling was used to estimate DPM concentrations at nearby sensitive locations. Two types of health impacts were evaluated:

- Chronic non-cancer hazard (averaging period equivalent to the exposure duration)
- Cancer risk (70-year ["lifetime"] averaging period)

There is limited information that characterizes non-cancer toxicity from acute exposure to DPM. The estimation of non-cancer health hazards is evaluated using model predicted pollutant concentrations and normalizing those by the corresponding reference exposure levels (RELs) that are established by the OEHHA to determine a hazard quotient. RELs are designed to protect sensitive individuals within the population. Unlike cancer health effects, non-cancer health effects are generally assumed to have thresholds for adverse effects. In other words, injury from a pollutant will not occur until exposure to that pollutant has reached or exceeded a certain concentration threshold. However, no REL currently exists to evaluate acute health hazards associated with DPM. While acute exposure to DPM can lead to respiratory symptoms, neurophysiological symptoms, and acute irritation, there is insufficient exposure-response information from available acute health-effect studies to allow for the development of RELs to evaluate health hazards associated with acute DPM exposure (U.S. Environmental Protection Agency 2002). The lack of available exposure-response studies precludes the development of a threshold that would be presumed safe for acute exposure to DPM. Consequently, DPM acute health hazards were not evaluated in this HRA. Rather, potential chronic health hazards from DPM, which occur only from exposures via inhalation and the resulting effects on the respiratory system, were evaluated in this document.

The potential for chronic non-cancer hazards is evaluated by comparing the long-term exposure level (DPM concentration) calculated by air pollutant dispersion modeling to a chronic REL. A chronic REL is an established concentration at or below which no adverse health effects are anticipated to occur under continuous exposure for up to a lifetime.

Chronic non-cancer hazard quotients (HQ) are calculated by dividing the exposure period's average concentration (as estimated using air dispersion modeling) by the REL for that substance. When the HQ exceeds 1.0, there is increased concern that exposed individuals may experience respiratory system irritation or injury, particularly among sensitive individuals.

Cancer risk assessment involves estimating exposure to carcinogenic chemicals and multiplying the exposure dose by the cancer potency factor. As agreed per consultation with the air districts in the Study Area and described in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, a significant cancer risk is defined as a risk that exceeds 10 in one million.

Carbon Monoxide Hot-Spots

Increased traffic congestion during construction can contribute to high levels of CO. The Plan Area air districts have adopted screening criteria that provide a conservative indication of whether a project will cause a CO hot-spot and would require additional site-specific dispersion modeling to determine whether CO CAAQS would be exceeded (see Section 22.3.3.1). These screening criteria were used evaluate potential CO hot-spots created by increased traffic during construction. Vehicle data was provided by DWR and Fehr & Peers (see Appendix 19A).

22.3.1.2 Operation and Maintenance of the Water Conveyance Facility

Operation of the water conveyance facility would generate long-term (permanent) emissions of criteria pollutants (ROG, NO_X, CO, PM10, PM2.5), and GHGs (CO_2, CH_4, N_2O, SF_6, and HFCs) that would result in long-term effects on ambient air quality in the air quality study area. Emissions would originate from onroad vehicle exhaust, maintenance equipment exhaust, and electrical generation.

Operations and maintenance include both routine activities and yearly maintenance. Routine activities would occur on a daily basis throughout the year, whereas yearly maintenance would occur annually or every five years. Emissions associated with vehicle traffic and maintenance equipment were estimated using the EMFAC2014 and CalEEMod models, respectively. Emissions were quantified for both early long-term (ELT) and late long-term (LLT). Information on personnel and equipment currently required for O&M is unavailable. Consequently, the analysis assumes emissions associated with vehicle traffic and equipment are zero under both the No Action Alternative (NEPA point of comparison) and Existing Conditions (CEQA baseline). This approach represents a conservative assessment as the net impact of the project will be higher under zero baseline conditions. Detailed assumptions used in the emissions modeling are provided in Appendix 22A, *Air Quality Analysis Methodology*.

Long-term operation of the water conveyance facility would require the use of electricity for pumping and maintenance, which would result in emissions from the generation, distribution, and transmission of this electricity. Increases in annually electric consumption for all alternatives relative to the No Action Alternative (NEPA point of comparison) and Existing Conditions (CEQA baseline) were calculated in Chapter 21, *Energy,* Section 21.3.1.2. Criteria pollutant and GHG emissions generated by increased electricity consumption were calculated using the emission factors summarized in Appendix 22A, *Air Quality Analysis Methodology*.

22.3.1.3 Programmatic Assessment of CM2–CM21

Restoration techniques that require physical changes to the environment or that require use of construction equipment, such as construction and maintenance activities associated with restoration actions to restore, enhance, and manage physical habitat in the defined conservation zones (CZs) and Restoration Opportunity Areas (ROAs),[10] would primarily generate temporary construction emissions through earthmoving activities (e.g., grading), use of mobile and stationary construction equipment, and onroad vehicle movement. The conservation measures that consist of programs to reduce the adverse effects of various stressors on covered species (CM12–CM21) are anticipated to generate the same emissions, relative to Existing Conditions and the No Action Alternative. Therefore, only the air quality and GHG impacts of CM2–CM11 are analyzed (programmatically) for the proposed BDCP.

Pollutant emissions and associated health and odor impacts are highly dependent on the total amount of distributed area; the type, location, and duration of construction; and the intensity of construction activity. Thus, construction effects would vary depending on the habitat restoration and enhancement conservation actions implemented under the BDCP.

Long-term air quality and GHG effects are associated with changes in the permanent, continued daily use of the study area. Operational emissions from the implementation of CM2–CM11 would primarily result from vehicle trips for site inspections, monitoring, and routine maintenance. Implementing CM2–CM11 would also affect long-term sequestration rates through land use changes, such as conversion of agricultural land to wetlands, inundation of peat soils, drainage of peat soils, and removal or planting of carbon-sequestering plants (see below).

Information on the location and types of construction equipment required for each conservation measure is unavailable. Likewise, the levels of potential long-term operation and maintenance activities that may result from implementation of these measures are currently unknown. Consequently, a quantified analysis of potential criteria pollutant and GHG emissions is not possible, so a qualitative assessment of air quality effects resulting from the proposed program was performed. The qualitative analysis took into account typical construction and operation and maintenance activities that would be undertaken for implementation of the habitat restoration and enhancement efforts in CM2–CM11, as described in Chapter 3, *Description of Alternatives,* Section 3.6.2.

Land Use Analysis

BDCP includes acreage targets for restoring tidal and riparian habitat, grassland, nontidal marsh, and seasonal wetland in the study area. Estimating potential changes in GHG emissions from habitat

[10] The Plan Area is subdivided into 11 CZs within which conservation targets for natural communities and covered species' habitats have been established. ROAs encompass those locations in the Plan Area considered most appropriate for the restoration of tidal habitats and within which restoration goals for tidal and associated upland natural communities will be achieved. See Section 3.3.2, *Conservation Measures*, for additional detail.

creation involves a considerable amount of uncertainty. In particular, key variables, including carbon cycling, methane production, and nitrogen cycling vary by land use type, season, and site-specific chemical and biological characteristics. Depending on these conditions, land use change associated with the BDCP may result in a net increase or decrease in GHG emissions. To fully characterize project impacts, additional information is required that is currently unknown. For example, acreage by land use type, site-specific land characteristics (e.g., salinity, pH, age of trees, type of grass, carbon content of soils), and fuel consumption data would be required to estimate the net difference in emissions between the removal and addition of GHGs into the atmosphere (i.e., GHG flux). Without local sampling and monitoring data, these values are unknown. Consequently, a quantified analysis of potential GHG emissions from land use change is not possible; a qualitative assessment of GHG flux resulting from the proposed program was therefore performed.

22.3.2 Determination of Effects

Potential air quality and GHG impacts were assessed in relation to relevant thresholds of significance established by agencies with jurisdictional authority, and/or applicable laws and regulations, including Appendix G of the State CEQA Guidelines. An effect was considered to be adverse (under NEPA) and significant (under CEQA) if it would result in any of the following conditions.

- Conflict with or obstruct implementation of the applicable air quality plan. For the purposes of this analysis, "conflict with or obstruct implementation" is defined as circumstances in which total direct and indirect emissions in excess of General Conformity *de minimis* thresholds (described below in Section 22.3.2.2) do not conform to the appropriate air basin SIPs. As discussed in Section 22.2.1.1, conformance is demonstrated by satisfying any of the following requirements.
    - Showing that the emission increases caused by the federal action are included in the SIP.
    - Demonstrating that the State agrees to revise the SIP to include the emission increases.
    - Offsetting the action's emissions in the same or nearby area to net zero within the same time frame as they are generated.
    - Mitigating to reduce the emission increase to net zero.
    - Utilizing a combination of the above options.
- Violate any air quality standard or substantially contribute to an existing or projected air quality violation. For the purposes of this analysis, "violate any air quality standard or substantially contribute to an existing or project air quality violation" is defined as circumstances in which construction or operational emissions exceed the applicable air district thresholds described in Section 22.3.2.1 and identified in Table 22-8.
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors). For the purposes of this analysis, a "cumulatively considerable net increase" is defined as circumstances in which total direct emissions exceed the applicable air district thresholds identified in Table 22-8. As discussed further in Section 22.3.3.17, the emissions thresholds presented in Table 22-8 represent the maximum emissions a project may generate before

contributing to a cumulative impact on regional air quality. Therefore, exceedances of the project-level thresholds, as identified in Table 22-8, would be cumulatively considerable.

- Expose sensitive receptors to substantial pollutant concentrations. For the purpose of this analysis, schools, day care facilities, medical facilities, parks, and residences are considered sensitive receptor locations. A "substantial pollutant concentration" is defined as levels in excess of the applicable air district thresholds described in Section 22.3.2.1 and identified in Table 22-8.
- Create objectionable odors affecting a substantial number of people. For the purpose of this analysis, construction of an odor-producing facility, as defined by the study area air quality management districts, would result in an "objectionable odor" capable of affecting a substantial number of people. Odor-producing facilities include landfills, wastewater treatment plants, food processing facilities, and certain agricultural activities.

22.3.2.1 Local Air District Thresholds

The following section summarizes the local air district thresholds and presents substantial evidence regarding the basis upon which they were developed, as well as describes how they are used to determine whether project construction and operational emissions would:

- interfere or impede with attainment of State or federal ambient air quality standards (CAAQS and NAAQS, respectively), or
- cause increased risk to human health.

Regional Thresholds for Air Basin Attainment of State and Federal Ambient Air Quality Standards

The alternatives fall under the jurisdiction of four air districts—YSAQMD, SMAQMD, BAAQMD, and SJVAPCD—each of which has different thresholds, as shown in Table 22-8, for regional criteria pollutants (as discussed in section 22.1.2.1, ROG and NO_X are regional pollutants, whereas PM is both a regional and local pollutant). The regional criteria pollutant thresholds identified in Table 22-8 were adopted by the Plan Area air districts to assist lead agencies in determining the significance of environmental effects with regards to local attainment of state and federal ambient air quality standards.

YSAQMD

YSAQMD's ozone precursor thresholds are based on CCAA requirements and YSAQMD Rule 3.20 (Ozone Transport Mitigation). Rule 3.20 accounts for ozone transport to neighboring air basins and establishes a 10 ton per year, "no net increase" threshold for NO_X and ROG from stationary sources. YSAQMD has concluded that the stationary pollutants described under Rule 3.20 are equally significant to those pollutants generated by land use projects, and as such, the 10 ton per year value serves as the project-level threshold for land use development projects within the YSAQMD. YSAQMD's regional PM10 threshold is based on the NSR program, which requires Best Available Control Technologies (BACT) to be applied when new or modified PM10emissions exceed 80 pounds per day. Therefore, PM10 emissions that trigger the BACT threshold for PM10 would result in substantial air emissions and have a potentially significant impact on local air quality. (Yolo-Solano Air Quality Management District 2007).

SMAQMD

The ozone precursor (ROG and NO_X) threshold adopted by SMAQMD approximately correlates to the heavy-duty vehicles and land use project emission reduction requirements committed to in the 2004 Ozone Attainment Plan for the Sacramento Federal Ozone Nonattainment Area. Accordingly, SMAQMD's thresholds have been adopted to assist the Sacramento area in reaching regional attainment status with the federal and state ozone standards. SMAQMD has not adopted a regional PM threshold.

BAAQMD and SJVAPCD

BAAQMD and SJVAPCD's ROG, NO_X, and regional PM thresholds are based on emissions levels identified under the "New Source Review" (NSR) program. The NSR program is a permitting program that was established by Congress as part of the CAAA to ensure that air quality is not significantly degraded by new sources of emissions. The NSR program requires stationary sources receive permits before they start construction and/or use of the equipment. By permitting large stationary sources, the NSR program assures that new emissions would not slow regional progress toward attaining the NAAQS. BAAQMD and SJVPACD have concluded that the stationary pollutants described under the NSR program are equally significant to those pollutants generated with land use projects. BAAQMD's and SJVAPCD's regional thresholds identified in Table 22-8 were set as the total emission thresholds associated within the NSR program to help attain the NAAQS. (Bay Area Air Quality Management District 2011; San Joaquin Valley Air Pollution Control District 2015).

Health-Based Thresholds for Project-Generated Pollutants of Human Health Concern

As discussed in Section 22.1.2, all criteria pollutants are associated with some form of health risk (e.g., asthma, asphyxiation). Adverse health effects associated with criteria pollutant emissions are highly dependent on a multitude of interconnected variables (e.g., cumulative concentrations, local meteorology and atmospheric conditions, the number and character of exposed individuals [e.g., age, gender]). Moreover, ozone precursors (ROG and NO_X) affect air quality on a regional scale. Health effects related to ozone are therefore the product of emissions generated by numerous sources throughout a region. Existing models have limited sensitivity to small changes in criteria pollutant concentrations, and as such, translating project-generated criteria pollutants to specific health effects would produce meaningless results. In other words, minor increases in regional air pollution from project-generated ROG and NO_X would have nominal or negligible impacts on human health.[11]

As such, an analysis of impacts to human health associated with project-generated regional emissions is not included in the project-level analysis. Increased emissions of ozone precursors (ROG and NO_X) generated by the project (see Section 22.3.3) could increase photochemical reactions and the formation of tropospheric ozone, which at certain concentrations, could lead to respiratory symptoms (e.g., coughing), decreased lung function, and inflammation of airways. While these health effects are associated with ozone, the impacts are a result of cumulative and regional ROG and NO_X

[11] As an example, the BAAQMD Multi-Pollutant Evaluation Method (MPEM) requires a 3 to 5 percent increase in regional ozone precursors to produce a material change in modeled human health impacts. Based on 2008 ROG and NO_X emissions in the Bay Area, a 3 to 5 percent increases equates to over 20,000 pounds per day or ROG and NO_X.

emissions, and that the incremental contribution of the project to specific health outcomes from criteria pollutant emissions would be limited and cannot be solely traced to the project. Please refer to Section 22.3.4 for a discussion of cumulative impacts.

Since localized pollutants generated by a project can directly affect adjacent sensitive receptors, the analysis of project-related impacts to human health focuses only on those localized pollutants with the greatest potential to result a significant, material impact on human health. This is consistent with the current state-of-practice and published guidance by SMAQMD (2014), SJVAPCD (2014), YSAQMD (2007), BAAQMD (2011), CAPCOA (2009), OEHHA (2003), and ARB (2000). The pollutants of concern include 1) locally concentrated PM and CO, 2) DPM[12] , and 3) *C. immitis* (Valley Fever). Locally adopted thresholds of significance for each pollutant are identified below.

Localized Particulate Matter Concentrations

YSAQMD

YSAQMD utilizes the ambient air quality standards as thresholds for localized total (exhaust and fugitive dust) PM. For the 24-hour and annual PM2.5 standards, the district recommends use of the NAAQS (35 $\mu g/m^3$) and CAAQS (12 $\mu g/m^3$), respectively. For the 24-hour and annual PM10 standards, the district recommends use of the CAAQS (50 $\mu g/m^3$ and 20 $\mu g/m^3$, respectively). The district also recommends implementation of BMPs to reduce and control fugitive visible dust (Jones pers. comm. B)

SMAQMD

SMAQMD considers a PM impact to be significant if a project would contribute substantially to a violation of the CAAQS, and considers a substantial contribution to be equal or greater than 5% of the CAAQS. As such, SMAQMD has established a localized threshold of 0.6 $\mu g/m^3$ for annual PM2.5, 2.5 $\mu g/m^3$ for 24-hour PM10, and 1 $\mu g/m^3$ for annual PM10 (exhaust and fugitive). SMAQMD does not have a localized threshold for 24-hour PM2.5 emission concentrations.

BAAQMD

BAAQMD adopted an incremental PM2.5 concentration-based significance threshold, where a "substantial" contribution is defined as total (exhaust and fugitive) PM2.5 concentrations exceeding 0.3 $\mu g/m^3$. BAAQMD has not established PM10 thresholds of significance. However, BAAQMD considers fugitive PM10 from earthmoving activities to be significant without application of dust control measures.

The BAAQMD's Board of Directors adopted these significance thresholds on June 2, 2010 to assist in the review of projects under CEQA. On March 5, 2012 the Alameda County Superior Court issued a judgment finding that the BAAQMD had failed to comply with CEQA when it adopted the thresholds.

[12] DPM is the primary TAC of concern for mobile sources—of all controlled TACs, emissions of DPM are estimated to be responsible for about 70 percent of the total ambient TAC risk (California Air Resources Board 2000). Given the risks associated with DPM, tools and factors for evaluating human health impacts from project-generated DPM have been developed and are readily available. Conversely, tools and techniques for assessing project-specific health outcomes as a result of exposure to other TAC (e.g., benzene) remain limited. These limitations impede the ability to evaluate and precisely quantify potential public health risks posed by TAC exposure.

Pending final resolution of the case, the BAAQMD is no longer recommending that the June 2, 2010 thresholds be used to assess a project's air quality impacts. The BAAQMD states that lead agencies may continue to rely on the Air District's 1999 Thresholds of Significance and may continue to make determinations regarding the significance of an individual project's air quality impacts based on the substantial evidence in the record for that project (Bay Area Air Quality Management District 2015). For this air quality analysis, the 2010 thresholds were used because they were established based on substantial evidence. The BAAQMD released the "Proposed Thresholds of Significance" in 2009, which listed the proposed thresholds for criteria pollutants, GHGs, community risk and hazards, and odors. The BAAQMD researched existing and projected sources of air quality contaminants and designed the 2010 Thresholds to comply with state and federal standards. The report "provides the substantial evidence in support of the thresholds of significance…" (emphasis added) (Bay Area Air Quality Management District 2015).

SJVAPCD

SJVAPCD adopted the EPA's Class II Significant Impact Levels (SILs) for incremental PM concentration-based significance thresholds. The EPA SILs for annual and 24-hour total (exhaust and dust) PM2.5 were vacated by Courts and new SILs have not been adopted as of the time of this writing. SJVAPCD (2014) recommends that until new SIL values are approved, PM10 SILs should be used for both PM10 and PM2.5 analyses. Accordingly, the project's total (exhaust and dust) PM2.5 and PM10 concentrations are evaluated against an annual 2.08 $\mu g/m^3$ threshold and 24-hour 10.4 $\mu g/m^3$ threshold. Similar to other air districts, the SJVAPCD considers fugitive PM from earthmoving activities to be significant without application of dust control measures.

Localized Carbon Monoxide Concentrations

Heavy traffic congestion can contribute to high levels of carbon monoxide. Individuals exposed to these CO "hot-spots" may have a greater likelihood of developing adverse health effects (as described in Section 22.1.2). The all Plan Area air districts consider localized CO emissions to result in significant impacts if concentrations exceed the CAAQS (see Table 22-8). All four air districts have adopted screening criteria that provide a conservative indication of whether a project-generated traffic will cause a potential CO hot-spot. The air districts establish that if the screening criteria are not met, a quantitative analysis through site-specific dispersion modeling of project-related CO concentrations would not be necessary and the project would not cause localized exceedances of CO CAAQS.

Screening criteria adopted by YSAQMD and SJVAPCD focus on whether a project would reduce the level of service (LOS) at affected intersects to LOS E or F, whereas screening criteria adopted by SMAQMD and BAAQMD include quantitative criteria based on the number of additional vehicles added to affected intersections. These quantitative metrics were established based on local modeling and provide a conservative estimate for the maximum number of vehicles that can be added to intersection without an exceedance of the CO CAAQS. The BAAQMD and SMAQMD CO screening criteria are summarized below.

BAAQMD

1. The project traffic would not increase traffic volumes at affected intersections to more than 44,000 vehicles per hour.
2. The project traffic would not increase traffic volumes at affected intersections to more than 24,000 vehicles per hour where vertical and/or horizontal mixing is substantially limited (e.g.,

tunnel, parking garage, bridge underpass, natural or urban street canyon, below-grade roadway).

3. Project is consistent with an applicable congestion management program established by the county congestion management agency for designated roads or highways, regional transportation plan, and local congestion management agency plans.

SMAQMD

1. The project will not result in an affected intersection experiencing more than 31,600 vehicles per hour.
2. The project will not contribute traffic to a tunnel, parking garage, bridge underpass, urban street canyon, or below-grade roadway; or other locations where horizontal or vertical mixing of air will be substantially limited.
3. The mix of vehicle types at the intersection is not anticipated to be substantially different from the County average.

Given that the BAAQMD's screening criteria are slightly more conservative than SMAQMD's criteria (affected intersection volume of 24,000 vehicles per hour vs. 31,600 vehicles per hour), the BAAQMD's screening criteria is conservatively used to evaluate whether project-generated traffic in YSAQMD and SJVAPCD would result in a CO hot-spot and violation of the CO CAAQS.

Localized Diesel Particulate Matter Concentrations

DPM is a form of localized PM (see above) that is generated by diesel equipment and vehicle exhaust. DPM has been identified as TAC and is particularly concerning as long-term exposure can lead to cancer, birth defects, and damage to the brain and nervous system. Accordingly, the Plan Area air districts have adopted separate thresholds to evaluate receptor exposure to DPM emissions. The "substantial" DPM threshold defined by the air districts is the probability of contracting cancer for the maximum exposed individual (MEI) exceeding 10 in 1 million, or the ground-level concentrations of non-carcinogenic TACs resulting in a hazard index (HI) greater than 1 for the MEI (see Table 22-8).

Valley Fever Exposure

Valley Fever can develop after receptor exposure to *C. immitis.* While flu-like symptoms develop in less than 40% of individuals exposed to the fungal spores, those presenting symptoms may experience fatigue, cough, chest pain, fever, rash, headache, and joint aches. Neither the State nor the Plan Area air districts have adopted thresholds to evaluate receptor exposure to increased Valley Fever risk. The potential for the project to expose receptors to Valley Fever is highest in areas known to contain *C. immitis* and during earthmoving activities that generate fugitive dust. Accordingly, uncontrolled construction dust emissions in endemic regions of *C. immitis* could result in increased health impacts from exposure of receptors to *C. immitis* spores.

Table 22-8. Air District Thresholds of Significance

Analysis	YSAQMD	SMAQMD	BAAQMD	SJVAPCD
Regional Criteria Pollutants (Construction)	ROG: 10 tons/year NO_X: 10 tons/year PM10: 80 lbs/day	NO_X: 85 lbs/day	ROG: 54 lbs/day NO_X: 54 lbs/day PM10: 82 lbs/day (exhaust only) PM2.5: 54 lbs/day (exhaust only)	ROG: 10 tons/year NO_X: 10 tons/year PM10: 15 tons/year PM2.5: 15 tons/year

Analysis	YSAQMD	SMAQMD	BAAQMD	SJVAPCD
Regional Criteria Pollutants (Operations)	Same as construction	ROG: 65 lbs/day NO_X: 65 lbs/day	ROG: Same as construction NO_X: Same as construction PM10: 82 lbs/day PM2.5: 54 lbs/day	Same as construction
Localized PM2.5	Violation of NAAQS for total (exhaust and dust) emissions (24-hour: 35 $\mu g/m^3$) or CAAQS (annual: 12 $\mu g/m^3$), and failure to implement dust BMPs	Increase greater than 0.6 $\mu g/m^3$ for total (exhaust and dust) concentration (annual) or failure to implement dust emission control practices[a]	Increase greater than 0.3 $\mu g/m^3$ for total (exhaust and dust) concentration (annual), and failure to implement fugitive dust	Increase greater than 2.08 $\mu g/m^3$ annual average or greater than 10.4 $\mu g/m^3$ 24-hour average for total (exhaust and dust) concentration, and failure to implement BMPs
Localized PM10	Violation of CAAQS for total (exhaust and dust) emissions (24-hour: 50 $\mu g/m^3$; annual: 20 $\mu g/m^3$), and failure to implement dust BMPs	Increase greater than 1 $\mu g/m^3$ annual or greater than 2.5 $\mu g/m^3$ 24-hour average[a] for total (exhaust and dust), or failure to implement emissions control practices[a]	Failure to implement emissions control practices	Increase greater than 2.08 $\mu g/m^3$ annual average or greater than 10.4 $\mu g/m^3$ 24-hour average for total (exhaust and dust) concentration, and failure to implement BMPs
Localized CO	Violation of CAAQS	Violation of CAAQS	Violation of CAAQS	Violation of CAAQS
Localized DPM	Increased cancer risk of 10 in 1 million or increased non-cancer hazard of greater than 1.0	Increased cancer risk of 10 in 1 million or increased non-cancer hazard of greater than 1.0	Increased cancer risk of 10 in 1 million; increased non-cancer hazard of greater than 1.0[b]	Increased cancer risk of 10 in 1 million or increased non-cancer hazard of greater than 1.0

Sources: Yolo-Solano Air Quality Management District 2007; Sacramento Metropolitan Air Quality Management District 2014; Bay Area Air Quality Management District 2011; San Joaquin Valley Air Pollution Control District 2002; San Joaquin Valley Air Pollution Control District 2009; Siong pers. comm. 2011; Villalvazo pers. comm.

[a] Per the SMAQMD's CEQA guidelines (2014), a "project is considered significant if emissions exceed a CAAQS or contribute substantially to an existing or projected violation of a CAAQS. A substantial contribution is considered an emission that is equal to or greater than 5% of a CAAQS."

[b] A quantitative cumulative analysis was not conducted due to the rural nature of the project area (additional major sources are not anticipated in the vicinity of the project area). Consequently, the BAAQMD's quantitative cumulative thresholds of an increase greater than 0.8 $\mu g/m^3$, increased cancer risk of 100 in 1 million, and increased non-cancer hazard of greater than 10 (HI) were not evaluated. However, cumulative health hazards are considered in relation to ongoing and reasonably foreseeable future projects in the air basin. Please refer to Section 22.3.3.17.

22.3.2.2 General Conformity *de minimis* Thresholds

The following section presents the *de minims* thresholds applicable to the proposed project that are used to evaluate whether the project would require a conformity determination pursuant to general conformity requirements.

Clean Air Act General Conformity Evaluation

The air quality study area is in federally classified nonattainment and/or maintenance areas for ozone, CO, PM10, and PM2.5 (Table 22-4). Consequently, to fulfill general conformity requirements, a General Conformity evaluation must be undertaken to identify whether the total ozone, CO, PM10, and PM2.5 emissions for the alternatives are subject to the General Conformity rule. The General Conformity evaluation must consider both direct and indirect sources of emissions for all nonattainment and/or maintenance pollutants, which include regulated precursor emissions. Regulated precursor emissions for ozone include ROG and NO_X. Regulated precursor emissions for PM2.5 include SO_2, NO_X, and ROG (see Table 22-4). Therefore, the General Conformity analysis evaluates each of these direct and indirect (precursor) emissions.

The General Conformity evaluation is made by comparing all emission sources (e.g., haul trucks, off-road equipment) to the applicable General Conformity *de minimis* thresholds. It should be noted that because power plants are subject to New Source Review permitting requirements, which are exempt from the General Conformity rule, emissions associated with electricity generation are not included in the General Conformity evaluation. Because the attainment status of the four area air basins differ with respect to ozone, CO, PM10, PM2.5, and SO_2, different *de minimis* thresholds must be applied to emissions generated within each air basin. Table 22-9 summarizes the *de minimis* thresholds applicable to each air basin.

Table 22-9. Federal *de minimis* Thresholds by Air Basin (tons per year)

Pollutant	SFNA	SJVAB	SFBAAB
NO_X[a]	25	10	100
VOC/ROG[b]	25	10	100
CO	100	100	100
PM10	100	100	–
PM2.5	100	100	100
SO_2[c]	100	100	100

[a] NO_X is a precursor ozone and PM. NO_X emissions in excess of 100 tons per year within federally designated PM10 or PM2.5 nonattainment or maintenance areas trigger a secondary PM threshold.
[b] ROG is a precursor ozone.
[c] SO_2 is a precursor to PM2.5.

22.3.2.3 Greenhouse Gas Thresholds

DWR Climate Action Plan/Greenhouse Gas Emissions Reduction Plan

In May 2012, DWR adopted the DWR Climate Action Plan-Phase I: Greenhouse Gas Emissions Reduction Plan (CAP), which details DWR's efforts to reduce GHG emissions consistent with EO S-3-05 and AB-32 (Appendix 22D, *DWR Climate Action Plan*). The CAP provides estimates of historical (going back to 1990), current, and future GHG emissions related to operations (e.g., energy use), construction (e.g., bulldozer), maintenance (e.g., flood protection facility upkeep), and business practices (e.g., DWR building related). The CAP specifies aggressive 2020 and 2050 emission reduction goals and identifies a list of GHG emissions reduction measures that DWR will undertake to achieve these goals.

DWR prepared its CAP consistent with CEQA Guidelines section 15183.5. This section of the CEQA Guidelines provides that a "Plan for the Reduction of Greenhouse Gas Emissions," which meets the specified requirements, "may be used in the cumulative impacts analysis of later projects." More specifically, "[l]ater project-specific environmental documents may tier from and/or incorporate by reference" the "programmatic review" conducted for the GHG reduction plan. "An environmental document that relies on a greenhouse gas reduction plan for a cumulative impacts analysis must identify those requirements specified in the plan that apply to the project, and, if those requirements are not otherwise binding and enforceable, incorporate those requirements as mitigation measures applicable to the project." (CEQA Guidelines section 15183.5.) Because global climate change, by its very nature, is a global cumulative impact[13], an individual project's compliance with a qualifying GHG Reduction Plan may suffice to mitigate the project's incremental contribution to that cumulative impact to a level that is not "cumulatively considerable." (See CEQA Guidelines, § 15064[h][3].)

Chapter 12 of DWR's CAP outlines how individual projects can demonstrate consistency with the CAP so that they may rely on the analysis it provides for the purposes of a CEQA cumulative GHG impacts analysis. The CAP requires that the following steps be taken to ensure that the project is consistent with the CAP:

- Identify, quantify, and analyze the GHG emissions from the proposed project and alternatives.
  - If construction emissions levels are greater than 25,000 MT CO_2e for the entire construction phase of the project or they exceed 12,500 MT CO_2e in any single year of construction, the project's construction emission cannot rely on the analysis provide in the DWR CAP and must complete a project specific analysis of the construction emissions for CEQA purposes.
- Emissions Reduction Measures CO-1 and CO-2 must be incorporated into the design of the project.
  - CO-1 Construction BMPs designed to minimize fuel consumption by construction and transportation of materials, reduce landfill material usage, and reduce emissions from cement production. DWR's recommended BMPs are listed in Appendix 3B.
  - CO-2 Compliance with CARB's 2007 Off-Road Diesel Vehicle Regulation designed to phase in the use of cleaner engines in diesel vehicles with engines greater than 25 horsepower and any other statewide regulations targeting GHG emissions reductions.
- Determine that the project does not conflict with DWR's ability to implement any of the specific action GHG emissions reduction measures outlined in the CAP.
  - OP-1 Termination of Power Supplies from Reid Gardner Power Plant
  - OP-2 Energy Efficiency Improvements
  - OP-3 Renewable Energy Procurement Plan
  - OP-5 High-Efficiency Energy Resources
  - BP-1 Participate in SMUD Commercial Greenergy Program
  - BP-2 Participate in SMUD Carbon Offset Program
  - BP-3 Implement the DWR Sustainability Policy

In addition to all of the above listed requirements, if implementation of the proposed project would result in additional energy demands on the SWP system of 15 GWh per year or greater the project

[13] Climate change is a global problem, and GHGs are global pollutants, unlike criteria air pollutants (such as ozone precursors, which are primarily pollutants of regional and local concern. Given their long atmospheric lifetimes (see Table 22-1), GHGs emitted by countless sources worldwide accumulate in the atmosphere. No single emitter of GHGs is large enough to trigger global climate change on its own. Rather, climate change is the result of the individual contributions of countless past, present, and future sources. Therefore, GHG impacts are inherently cumulative.

must perform additional analyses with the DWR SWP Power and Risk Office to determine of the additional energy demand will require DWR to take additional steps beyond those identified in the CAP to achieve its emissions reduction goals. If the analyses indicate that the additional load resulting from the proposed project would require DWR to modify existing or implement additional GHG emissions reduction measures, such measures must be approved by DWR SWP Power and Risk Office.

The BDCP GHG emissions analysis presented in this chapter meets the consistency requirements detailed in the DWR CAP.

Construction Emissions Approach and Threshold

Consistent with DWR project-level cumulative GHG emission analysis requirements, construction emissions of the BDCP project were calculated consistent with the *Guidance for Quantifying Greenhouse Gas Emissions and Determining the Significance of their Contribution to Global Climate Change for CEQA Purposes* and a GHG Emission Reduction Plan Consistency Determination Form from DWR's CAP was completed. Project-level GHG reduction measures (CO-1 and CO-2) included in the CAP have also been incorporated into the project design as environmental commitments (see Appendix 3B, *Environmental Commitments*).

As indicated in the impact analysis below (Section 22.3.3), BDCP construction emissions are in excess of 25,000 MT CO_2e for each project alternative (except for the No Action Alternative). As such, the significance determination for construction-related emissions cannot be determined by relying on the analysis in DWR's CAP.

Neither the CEQA nor NEPA lead agencies have established quantitative significance thresholds for GHG emissions; instead each project put forth by the lead agencies is evaluated on a case by case basis using the most up to date calculation and analysis methods. However, by enacting the Global Warming Solutions Act of 2006 (AB 32), the State Legislature has established statewide GHG reduction targets. Further, the Legislature has determined that GHG emissions, as they relate to global climate change, are a source of adverse environmental impacts in California and should be addressed under CEQA. AB 32 did not amend CEQA, although the legislation identifies the myriad environmental problems in California caused by global warming (Health and Safety Code, Section 38501(a)). SB 97, in contrast, added explicit requirements that CEQA analysis address the impacts of GHG emissions (PRC Sections 21083.05 and 21097).

Scientific studies (as best represented by the IPCC's periodic reports) demonstrate that climate change is already occurring due to past GHG emissions. Evidence concludes that global emissions must be reduced below current levels to avoid the most severe climate change impacts. Given the seriousness of climate change and the regional significance of BDCP, DWR has determined that for the purposes of this analysis, any substantial increase in construction-related GHG emissions above net zero (0) would result in a significant impact. A net zero threshold represents a conservative assessment of construction emissions considering that any GHGs released during construction will be temporary and cease once construction is complete. Regardless, DWR selected a net zero threshold out of an abundance of caution to avoid underrepresenting potential impacts.

In accordance with scientific consensus regarding the cumulative nature of GHGs, the analysis provides a cumulative evaluation of GHG emissions. Unlike traditional cumulative impact assessments, this analysis is still project-specific in that it only evaluates direct emissions generated by BDCP; given the global nature of climate change, the analysis does not include emissions from past, present, and reasonably foreseeable projects in the study area. Consequently, effects associated with GHG emissions analyzed in this evaluation are cumulative in nature.

Operational Emissions Approach and Threshold

Consistent with DWR project-level cumulative GHG emission analysis requirements, operational emissions associated with increased SWP pumping and project maintenance are consistent with the “Guidance for Quantifying Greenhouse Gas Emissions and Determining the Significance of their Contribution to Global Climate Change for CEQA Purposes” and a GHG Emission Reduction Plan Consistency Determination Form from DWR’s CAP was completed. BDCP will result in additional SWP energy demands in excess of 15 GWh/year (see Appendix 22A, *Air Quality Analysis Methodology,* for expected increase in energy demand). Consultation with the DWR SWP Power and Risk Office has occurred to verify whether DWR’s Renewable Power Procurement Plan would accommodate the additional energy demand associated with BDCP. Modifications to the Renewable Power Procurement Plan for alternatives that would require additional renewable energy resources to maintain DWR’s emissions reduction trajectory have been identified to ensure covered BDCP activities do not conflict with DWR’s ability to achieve the GHG reductions outlined in the CAP. As such, operational emissions from 1) increased SWP pumping and 2) project maintenance are addressed consistent with DWR’s CAP and are found to be less than significant. Please refer to Appendix 3B, *Environmental Commitments*, Section 3B.1.10 for applicable best management practices from the CAP that will be implemented by the project.

CVP Operational Emissions Approach and Threshold

New water conveyance facilities associated with BDCP would be constructed, owned, and operated as a component of the SWP. Water pumped at the new facilities would be primarily for SWP and CVP customers. Hydropower is the primary energy source for CVP activities. Increased CVP pumping associated with BDCP will therefore not directly result in increased GHG emissions (hydro is considered neutral with respect to emissions). However, hydropower supplied to BDCP would reduce the quantity of hydropower supplied to the California grid and/or other CVP customers. BDCP may therefore result in an indirect emissions effect as energy from alternative sources (e.g., natural gas, solar) would be required to meet this demand.[14] Increased GHG emissions generated by CVP pumping could impede attainment of statewide renewable and GHG reduction goals, as outlined in AB 32. Accordingly, an adverse effect would occur if indirect GHG emissions would conflict with AB 32 and state RPS goals.

---

[14] While the analysis of GHG impacts focuses on indirect emissions from reduced quantities of hydropower supplied to the California grid, some research suggests that operation of hydroelectric turbines may release dissolved CH4, resulting in a net source of GHG emissions. Changes in flow rates and water conveyance may also affect GHG flux rates in adjacent canals and rivers. However, the GHG flux rate and amount of released CH_4 is highly variable and depends on a number of site-specific factors, including the reservoir depth, amount of organic material/plant material, the flow rate, and the reservoir/river location (Teodoru et al. 2012). Moreover, it is uncertain how the incremental increase in CVP power demand and changes in water conveyance associated with the BDCP would affect flow rates at individual hydroelectric facilities and associated the relationship among dissolved and atmospheric CH_4. Accordingly, neither an analysis of CH_4 emissions during turbine operation nor changes in GHG flux rates in upstream and downstream tributaries is not included in this EIR/EIS as they would be speculative.

22.3.3 Effects and Mitigation Approaches

22.3.3.1 No Action Alternative

NEPA Effects: The No Action Alternative is the future condition that would occur if none of the action alternatives were implemented. The No Action Alternative includes projects and programs with defined management and/or operational plans, including facilities under construction as of February 13, 2009, because those actions would be consistent with the continuation of existing management direction or level of management for plans, policies, and operations by the NEPA lead agencies and other agencies. The No Action Alternative assumptions also include projects and programs that received approvals and permits in 2009 to remain consistent with existing management direction. A more comprehensive list of projects and programs are listed in Appendix 3D, *Defining Existing Conditions, the No Action/No Project Alternative, and Cumulative Impact Conditions*.

Facilities under construction as of February 13, 2009 would result in short-term criteria pollutant and GHG emissions from land disturbance and the use of heavy-duty equipment. Pollutant emissions are highly dependent on the total amount of disturbed area, the duration of construction, and the intensity of construction activity. In addition, the number and types of heavy-duty equipment significantly affect emissions generated by vehicle exhaust. Construction impacts can thus vary depending on the type of construction project implemented under the No Action Alternative. Construction emissions associated with the No Action Alternative would result in an adverse effect if the incremental difference, or increase, relative to Existing Conditions exceeds applicable air district or federal de minimis thresholds.

As described in Chapter 3, *Description of Alternatives*, many of the ongoing programs include development of future projects that would require additional project-level environmental review. Future federal actions would be required to comply with NEPA and other federal laws and regulations. Mitigation and permit requirements would be implemented on a case-by-case basis,

Activities associated with long-term maintenance of the existing SWP and CVP systems (e.g., inspection trips) would continue, but there would be no changes attributable to the BDCP that would affect long-term operational emissions. Annual electric consumption for pumping under Existing Conditions and the No Action Alternative were calculated in Chapter 21, *Energy* (see Section 21.3.3, Table 21-12). Criteria pollutant and GHG emissions generated by electricity consumption and distribution are presented in Table 22-10.

Table 22-10. Total Criteria Pollutant and GHG Emissions from Electricity Consumption during Operation of the No Action Alternative (tons/year)[a,b,c]

Condition	ROG	CO	NO_X	PM10	PM2.5[d]	SO_2	CO_2e[e]
Existing	9	88	1,212	102	102	512	1,672,965
No Action Alternative (LLT)	7	68	931	79	79	393	1,285,551

[a] Emissions assume implementation of RPS (see Appendix 22A, *Air Quality Analysis Methodology*).

[b] Because GHG emissions are cumulative (see Section 22.3.2.1) and not evaluated at the local air basin or air district level. The GHG analysis for SWP power utilizes actual and forecasted GHG emissions rates for the SWP system, which differs slightly from the above analysis. Statewide grid average emission factors were utilized for the above analysis as criteria pollutant emission factors for SWP were unavailable.

[c] Power plants located throughout the state supply the grid with power, which will be distributed to the study area to meet project demand. Power supplied by statewide power plants will generate criteria pollutants. Because these power plants are located throughout the state, criteria pollutant emissions associated with the No Action Alternative electricity demand cannot be ascribed to a specific air basin or air district within the study area.

[d] Emission factors for PM2.5 are currently unavailable. Consequently, PM2.5 emissions were assumed to equal PM10 emissions. Because PM2.5 represents a fraction of PM10, this approach represents a conservative assessment of PM2.5 emissions from electricity consumption.

[e] Emissions presented in metric tons of CO_2e.

As discussed in Chapter 21, *Energy*, Section 21.3.3.1, there would be no substantial changes in CVP and SWP energy production or use for the No Action Alternative because there would be no change in the operations of the existing CVP and SWP hydroelectric generation facilities or pumping facilities. Because emissions rates are expected to decrease in the future due to state mandates for renewable energy production, implementation of the No Action Alternative would result in a decrease in criteria pollutants and GHG emissions.

BDCP conservation measures, such as restoration of wildlife habitat in Suisun Marsh, would not take place, although restoration actions could be undertaken as part of other actions. For example, approximately 8,000 acres of sensitive habitat in the Delta and vicinity would be restored as part of the conditions of biological opinions on other state and federal actions, and these restoration actions could result in temporary air quality effects similar to the effects of the restoration components of the action alternatives. However, there would be no substantial changes in criteria pollutants or GHG emissions under the No Action Alternative and therefore no adverse air quality effects above and beyond those already occurring due to operation of the SWP and CVP. Most of the existing programs and projects comprising the No Action Alternative would not require substantial operation and maintenance activities or the use of mechanical equipment in the same area as the proposed facilities.

Because power plants are located throughout the state, criteria pollutant emissions associated with electricity demand under the No Action Alternative cannot be ascribed to a specific air basin or air district within the study area and it cannot be determined whether the air pollutant emissions associated with electricity generation would degrade air quality in a specific air basin or air district within the study area. Consequently, impacts relating to the electricity consumption under the No Action Alternative through a comparison of electricity-related emissions to the local thresholds shown in Table 22-8 or the general conformity *de minimis* thresholds indicated in Table 22-9, which are established to manage emissions sources under the jurisdiction of individual air districts, would be inappropriate. Criteria pollutant emissions from electricity consumption, which are summarized in Table 22-10, are therefore provided for informational purposes only and are not included in the impact conclusion. Consequently, the No Action Alternative would not result in an adverse effect to air quality.

Climate Change and Catastrophic Seismic Risks

The Delta and vicinity are within a highly active seismic area, with a generally high potential for major future earthquake events along nearby and/or regional faults, and with the probability for such events increasing over time. Based on the location, extent and non-engineered nature of many existing levee structures in the Delta area, the potential for significant damage to, or failure of, these structures during a major local seismic event is generally moderate to high. (See Appendix 3E, *Potential Seismic and Climate Change Risks to SWP/CVP Water Supplies* for more detailed discussion). To reclaim land or rebuild levees after a catastrophic event due to climate change or a seismic event would introduce considerable heavy equipment and associated vehicles, including dozers, excavators, pumps, water trucks, and haul trucks, which would generate emissions and create adverse air quality and GHG effects.

***CEQA Conclusion*:** Construction of ongoing projects, programs, and plans under the No Action Alternative would generate short-term emissions that could temporary affect regional and local air quality. These projects would be required to comply with air district rules and regulations to reduce construction-related criteria pollutant and GHG emissions. Mitigation and permit requirements would be implemented on a case-by-case basis. Energy required for long-term operation of the No Action Alternative will be supplied by the California electrical grid. Power plants located throughout the state supply the grid with power, which will be distributed to the study area to meet demand. Because these power plants are located throughout the state, criteria pollutant emissions associated with the No Action Alternative electricity demand cannot be ascribed to a specific air basin or air district within the study area. However, as shown in Table 22-10, operation of the No Action Alternative would result in a net decrease in all criteria air pollutants and GHG emissions, relative to Existing Conditions. Consequently, a regional air quality benefit would be realized under the No Action Alternative. This impact would be less than significant. No mitigation is required.

Climate Change and Catastrophic Seismic Risks

The Delta and vicinity are within a highly active seismic area, with a generally high potential for major future earthquake events along nearby and/or regional faults, and with the probability for such events increasing over time. To reclaim land or rebuild levees after a catastrophic event due to climate change or a seismic event would introduce considerable heavy equipment and associated vehicles, including dozers, excavators, pumps, water trucks, and haul trucks, which would generate emissions and create significant air quality and GHG impacts.

22.3.3.2 Alternative 1A—Dual Conveyance with Pipeline/Tunnel and Intakes 1–5 (15,000 cfs; Operational Scenario A)

A total of five intakes would be constructed under Alternative 1A. For the purposes of this analysis, it was assumed that Intakes 1–5 would be constructed. Alternative 1A includes construction of an intermediate forebay, and the water conveyance facility would be a buried pipeline and tunnels (Figures 3-2 and 3-3 in Chapter 3, *Description of Alternatives*).

Construction and operation of Alternative 1A would require the use of electricity, which would be supplied by the California electrical grid. Power plants located throughout the state supply the grid with power, which will be distributed to the study area to meet project demand. Power supplied by statewide power plants will generate criteria pollutants. Because these power plants are located throughout the state, criteria pollutant emissions associated with Alternative 1A electricity demand cannot be ascribed to a specific air basin or air district within the study area. Comparing emissions to thresholds shown in Table 22-8, which are established to manage emissions sources under the jurisdiction of individual air districts, would therefore be inappropriate. Criteria pollutant emissions from electricity consumption, which are summarized in Table 22-11, are therefore provided for informational purposes only and are not included in the impact conclusion.

Table 22-11. Criteria Pollutant Emissions from Electricity Consumption: Construction and Net Project Operations, Alternative 1A (tons/year)[a,b]

Year	Analysis	ROG	CO	NO_X	PM10	PM2.5[c]	SO_2
2016	-	0	0	0	0	0	0
2017	-	0	0	0	0	0	0
2018	-	<1	<1	<1	<1	<1	<1
2019	-	<1	3	<1	<1	<1	1
2020	-	<1	13	1	1	1	5
2021	-	<1	34	2	3	3	14
2022	-	<1	47	3	4	4	20
2023	-	<1	42	3	4	4	18
2024	-	<1	44	3	4	4	18
2025	-	<1	30	2	2	2	12
2026	-	<1	11	1	1	1	4
2027	-	<1	2	<1	<1	<1	1
2028	-	<1	<1	<1	<1	<1	<1
2029	-	<1	<1	<1	<1	<1	<1
ELT	CEQA	2	17	230	19	19	97
LLT	NEPA	2	21	285	24	24	120
LLT	CEQA	1	9	119	10	10	50

NEPA = Compares criteria pollutant emissions after implementation of Alternative 1A to the No Action Alternative.

CEQA = Compares criteria pollutant emissions after implementation of Alternative 1A to Existing Conditions.

[a] Emissions assume implementation of RPS (see Appendix 22A, *Air Quality Analysis Methodology*). Power plants that generate electricity for the proposed project would be subject to local air district permitting requirements, including standards to implement Best Available Control Technology (BACT) to reduce criteria pollutant emissions.

[b] Because GHG emissions are cumulative (see Section 22.3.2.1) and not evaluated at the local air basin or air district level, they are discussed in Impacts AQ-21 and AQ-22. The GHG analysis for SWP power utilizes actual and forecasted GHG emissions rates for the SWP system, which differs slightly from the above analysis. Statewide grid average emission factors were utilized for the above analysis as criteria pollutant emission factors for SWP were unavailable. Please also note that the above analysis does not account for additional renewable energy that will be procured through modifications to DWR's REPP (see Impact AQ-22). Accordingly, the emissions results presented above represent a conservative assessment of potential criteria pollutant emissions.

[c] Emission factors for PM2.5 are currently unavailable. Consequently, PM2.5 emissions were assumed to equal PM10 emissions. Because PM2.5 represents a fraction of PM10, this approach represents a conservative assessment of PM2.5 emissions from electricity consumption.

Construction activities would generate emissions of ozone precursors (ROG and NO_X), CO, PM10, PM2.5, and SO_2. Table 22-12 summarizes criteria pollutant emissions that would be generated in the BAAQMD, SMAQMD, SJVAPCD, and YSAQMD in pounds per day and tons per year. Emissions estimates include implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*). Although emissions are presented in different units (pounds and tons), the amounts of emissions are identical (i.e., 2,000 pounds is identical to 1 ton). Summarizing emissions in both pounds per day and tons per year is necessary to evaluate project-level effects against the appropriate air district thresholds, which are given in both pounds and tons (see Table 22-8).

A shown in Appendix 22B, *Air Quality Assumptions*, construction activities during several phases will likely occur concurrently. To ensure a conservative analysis, the maximum daily emissions during these periods of overlap were estimated assuming all equipment would operate at the same time—this gives the maximum total project-related air quality impact during construction. Accordingly, the daily emissions estimates represent a conservative assessment of construction impacts. Exceedances of the air district thresholds are shown in underlined text.

Table 22-12. Criteria Pollutant Emissions from Construction of Alternative 1A (pounds/day and tons/year)

	Maximum Daily Emissions (pounds/day)										Annual Emissions (tons/year)									
	Bay Area Air Quality Management District										Bay Area Air Quality Management District									
	ROG	NO_X	CO	PM10			PM2.5			SO_2	ROG	NO_X	CO	PM10			PM2.5			SO_2
Year				Exhaust	Dust	Total	Exhaust	Dust	Total					Exhaust	Dust	Total	Exhaust	Dust	Total	
2016	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2017	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2018	11	158	69	1	102	103	1	25	26	2	<1	2	2	<1	1	1	<1	<1	<1	<1
2019	28	349	188	2	168	170	2	41	43	3	2	18	15	<1	3	3	<1	1	1	<1
2020	42	457	274	3	195	198	3	48	51	4	4	29	25	<1	5	5	<1	1	1	<1
2021	46	505	295	3	223	226	3	55	58	4	5	38	33	<1	7	8	<1	2	2	<1
2022	53	608	329	4	293	297	3	74	77	5	5	44	34	<1	11	11	<1	3	3	<1
2023	114	1,039	674	8	479	487	8	105	112	9	9	67	53	1	25	26	1	5	6	1
2024	123	1,174	716	9	600	608	8	135	143	11	12	92	74	1	31	32	1	6	7	1
2025	113	1,109	651	7	565	572	7	130	137	10	8	57	46	1	21	21	1	4	5	1
2026	75	820	448	5	487	491	5	113	117	9	6	44	34	<1	19	20	<1	4	4	<1
2027	64	698	373	9	445	454	8	103	111	8	3	24	18	<1	16	16	<1	3	3	<1
2028	24	387	151	2	343	345	2	79	81	4	<1	3	1	<1	5	5	<1	1	1	<1
2029	8	154	49	1	113	113	1	29	30	2	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Thresholds	*54*	*54*	-	*82*	*BMPs*	-	*54*	*BMPs*	-	-	-	-	-	-	-	-	-	-	-	-
	Sacramento Metropolitan Air Quality Management District										Sacramento Metropolitan Air Quality Management District									
	ROG	NO_X	CO	PM10			PM2.5			SO_2	ROG	NO_X	CO	PM10			PM2.5			SO_2
Year				Exhaust	Dust	Total	Exhaust	Dust	Total					Exhaust	Dust	Total	Exhaust	Dust	Total	
2016	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2017	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2018	74	827	492	14	179	193	13	32	45	3	3	28	19	1	11	11	1	2	2	<1
2019	71	738	491	8	337	345	8	58	66	4	4	27	33	1	24	25	1	3	4	<1
2020	96	1,073	658	12	420	433	12	68	80	4	9	70	60	1	35	36	1	5	6	<1
2021	118	1,281	800	14	543	556	13	89	102	5	11	98	84	1	50	51	1	7	8	<1
2022	191	2,015	1,524	18	794	809	18	126	143	12	17	135	142	2	72	73	1	10	11	1
2023	395	3,471	2,769	42	1,163	1,199	40	184	221	29	36	284	274	3	107	111	3	15	18	2
2024	561	4,992	3,624	64	1,579	1,643	62	256	317	32	46	347	316	5	130	135	5	18	23	2
2025	509	4,950	3,396	59	1,695	1,753	57	263	319	31	34	247	228	4	86	90	4	12	16	1
2026	361	2,885	2,071	36	911	947	35	168	203	23	32	214	201	4	77	80	3	11	15	1
2027	389	3,309	2,368	50	1,009	1,059	49	179	228	31	28	205	179	4	87	91	3	13	16	1
2028	172	1,454	960	11	675	685	11	120	130	8	8	52	47	1	35	36	1	5	6	<1
2029	22	331	164	2	171	173	2	38	40	3	<1	3	3	<1	3	3	<1	<1	<1	<1
Thresholds	-	*85*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Year	San Joaquin Valley Air Pollution Control District										San Joaquin Valley Air Pollution Control District									
	ROG	NO_X	CO	PM10			PM2.5			SO_2	ROG	NO_X	CO	PM10			PM2.5			SO_2
				Exhaust	Dust	Total	Exhaust	Dust	Total					Exhaust	Dust	Total	Exhaust	Dust	Total	
2016	0	0	0	0	29	29	0	4	4	0	0	0	0	0	2	2	0	0	0	0
2017	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2018	29	135	199	2	113	116	2	14	16	1	2	7	11	<1	12	12	<1	2	2	<1
2019	97	750	701	8	192	201	8	24	32	3	11	81	78	1	18	19	1	2	3	<1
2020	190	1,391	1,339	18	309	327	17	38	55	5	20	139	137	2	35	36	2	4	6	<1
2021	271	2,072	1,906	29	719	747	28	83	111	7	30	217	217	3	56	58	3	7	9	1
2022	200	1,338	1,479	16	274	290	15	35	50	4	28	185	210	2	33	35	2	4	6	1
2023	175	1,105	1,283	12	175	187	11	23	34	4	25	151	184	2	17	19	2	2	4	1
2024	172	1,032	1,233	10	148	159	10	20	30	3	24	139	169	1	16	18	1	2	4	<1
2025	143	839	963	8	117	125	8	16	24	3	15	92	105	1	13	14	1	2	3	<1
2026	94	592	602	5	77	82	5	9	14	2	6	37	35	<1	3	3	<1	<1	1	<1
2027	4	5	18	14	3	17	14	1	15	0	<1	<1	1	1	<1	1	1	<1	1	<1
2028	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2029	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Thresholds	-	-	-	-	-	-	-	-	-	-	*10*	*10*	-	-	-	*15*	-	-	*15*	-

Year	Yolo Solano Air Quality Management District										Yolo Solano Air Quality Management District									
	ROG	NO_X	CO	PM10			PM2.5			SO_2	ROG	NO_X	CO	PM10			PM2.5			SO_2
				Exhaust	Dust	Total	Exhaust	Dust	Total					Exhaust	Dust	Total	Exhaust	Dust	Total	
2016	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2017	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2018	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2019	4	112	23	<1	30	31	<1	8	8	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
2020	4	112	24	<1	30	31	<1	8	8	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
2021	8	199	44	1	55	56	1	14	15	1	<1	3	1	<1	1	1	<1	0	0	0
2022	16	391	88	1	112	114	1	29	30	2	1	17	4	<1	5	5	<1	1	1	0
2023	21	454	122	1	164	165	1	42	44	3	1	15	4	<1	5	5	<1	1	1	0
2024	21	444	121	1	164	165	1	42	44	3	1	14	4	<1	5	5	<1	1	1	0
2025	20	418	117	1	158	159	1	41	42	3	<1	10	3	<1	4	4	<1	1	1	0
2026	16	329	94	1	127	128	1	33	34	3	<1	9	3	<1	3	3	<1	1	1	0
2027	16	318	93	1	127	128	1	33	34	3	<1	10	3	<1	4	4	<1	1	1	0
2028	13	252	75	1	102	103	1	26	27	2	<1	9	3	<1	4	4	<1	1	1	0
2029	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Thresholds	-	-	-	-	-	*80*	-	-	-	-	*10*	*10*	-	-	-	-	-	-	-	-

Operation and maintenance activities under Alternative 1A would result in emissions of ROG, NO_X, CO, PM10, PM2.5, and SO_2. Emissions were quantified for both ELT and LLT conditions, although activities would take place annually until project decommissioning. Future emissions, in general, are anticipated to lessen because of continuing improvements in vehicle and equipment engine technology.

Table 22-13 summarizes criteria pollutant emissions associated with operation of Alternative 1A in the BAAQMD, SMAQMD, and SJVAPCD in pounds per day and tons per year (no operational emissions would be generated in the YSAMQD). Although emissions are presented in different units (pounds and tons), the amounts of emissions are identical (i.e., 2,000 pounds is identical to 1 ton). Summarizing emissions in both pounds per day and tons per year is necessary to evaluate project-level effects against the appropriate air district thresholds, which are given in both pounds and tons (see Table 22-8).

Table 22-13. Criteria Pollutant Emissions from Operation of Alternative 1A (pounds per day and tons per year)

	Maximum Daily Emissions (pounds/day)						Annual Emissions (tons/year)					
	Bay Area Air Quality Management District						Bay Area Air Quality Management District					
Condition	ROG	NO_X	CO	PM10	PM2.5	SO_2	ROG	NO_X	CO	PM10	PM2.5	SO_2
ELT	3	19	32	6	2	<1	0.01	0.08	0.14	0.02	0.01	<0.01
LLT	3	16	31	6	1	<1	0.01	0.07	0.14	0.02	0.01	<0.01
Thresholds	*54*	*54*	-	*82*	*82*	-	-	-	-	-	-	
	Sacramento Metropolitan Air Quality Management District						Sacramento Metropolitan Air Quality Management District					
Condition	ROG	NO_X	CO	PM10	PM2.5	SO_2	ROG	NO_X	CO	PM10	PM2.5	SO_2
ELT	4	27	51	9	3	<1	0.21	1.24	2.60	0.42	0.12	0.01
LLT	4	23	48	8	2	<1	0.18	1.05	2.48	0.41	0.11	0.01
Thresholds	*65*	*65*	-	-	-	-	-	-	-	-	-	-
	San Joaquin Valley Air Pollution Control District						San Joaquin Valley Air Pollution Control District					
Condition	ROG	NO_X	CO	PM10	PM2.5	SO_2	ROG	NO_X	CO	PM10	PM2.5	SO_2
ELT	3	19	36	6	2	<1	0.01	0.07	0.13	0.02	<0.01	<0.01
LLT	3	16	33	6	1	<1	0.01	0.06	0.12	0.01	<0.01	<0.01
Thresholds	-	-	-	-	-	-	*10*	*10*	-	*15*	*15*	-

Impact AQ-1: Generation of Criteria Pollutants in Excess of the SMAQMD Regional Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: As shown in Table 22-12, construction emissions would exceed SMAQMD's daily NO_X threshold for all years between 2018 and 2029, even with implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*). All other pollutants would be below air district thresholds and therefore would not result in an adverse regional air quality effect. Since NO_X is a precursor to ozone and PM, exceedances of SMAQMD's daily NO_X threshold could impact both regional ozone and PM formation, which could worsen regional air quality and air basin attainment of the NAAQS and CAAQS.

While equipment could operate at any work area identified for this alternative, the highest level of NO_X emissions in the SMAQMD is expected to occur at those sites where the duration and intensity of construction activities would be greatest. This includes all intake and intake pumping plant sites along the east bank of the Sacramento River, as well as the intermediate forebay (and pumping plant) site west of South Stone Lake and east of the Sacramento River.

DWR has identified several environmental commitments to reduce construction-related criteria pollutants in the SMAQMD (see Appendix 3B, *Environmental Commitments*). These commitments include performance standards for newer and cleaner off-road equipment, marine vessels, and haul trucks. All tunneling locomotives would be required to utilize Tier 4 engines, and air district recommended BMPs for proper engine maintenance and idling restrictions would also be implemented. These environmental commitments will reduce construction-related emissions; however, as shown in Table 22-12, NO_X emissions would still exceed SMAQMD's threshold identified in Table 22-8.

Mitigation Measures AQ-1a and AQ-1b would be available to reduce NO_X emissions, and would thus address regional effects related to secondary ozone and PM formation.

***CEQA Conclusion*:** NO_X emissions generated during construction would exceed SMAQMD's threshold identified in Table 22-8. Since NO_X is a precursor to ozone and PM, exceedances of SMAQMD's daily NO_X threshold could impact both regional ozone and PM formation. SMAQMD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS or NAAQS. The impact of generating NO_X emissions in excess of local air district thresholds would therefore violate applicable air quality standards in the study area and could contribute to or worsen an existing air quality conditions. This would be a significant impact. Mitigation Measures AQ-1a and AQ-1b would be available to reduce NO_X emissions to a less-than-significant level by offsetting emissions to quantities below SMAQMD CEQA thresholds (see Table 22-8).

Mitigation Measure AQ-1a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants[15]

DWR will reduce criteria pollutant emissions generated by the construction of the water conveyance facilities associated with BDCP within the SFNA through the creation of offsetting reductions of emissions. The preferred means of undertaking such offsite mitigation shall be through a partnership with the SMAQMD involving the payment of offsite mitigation fees. Criteria pollutants in excess of the federal *de minimis* thresholds shall be reduced to net zero (0) (see Table 22-9). Criteria pollutants not in excess of the *de minimis* thresholds, but above any applicable air pollution control or air quality management district CEQA thresholds[16] shall be reduced to quantities below the numeric thresholds (see Table 22-8).[17]

[15] In the title of this mitigation measure, the phrase "for other pollutants" is intended to apply to other alternatives, where associated impacts to other pollutants may exceed thresholds other than NO_X.

[16] For example, NOx emissions in a certain year may exceed BAAQMD's 54 pound per day CEQA threshold, but not the 100 ton annual *de minimis* threshold. According to Appendix G of the State CEQA Guidelines, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make determinations regarding the significance of an impact.

[17] For example, emissions of NO_X generated by Alternative 1A both exceed the federal *de minimis* threshold for the SVAB and the SMAQMD's CEQA threshold. NO_X emissions must therefore be reduced to net zero (0).

DWR will undertake in good faith an effort to enter into a development mitigation contract with SMAQMD in order to reduce criteria pollutant emissions generated by the construction of the water conveyance facilities associated with BDCP. The preferred source of emissions reductions for NO_X, PM, and ROG shall be through contributions to SMAQMD's HDLEVIP. The HDLEVIP is designed to reduce NO_X, PM, and ROG from on- and offroad sources. The program is managed and implemented by SMAQMD on behalf of all air districts within the SFNA, including the YSAQMD.

SMAQMD's incentive programs are a means of funding projects and programs capable of achieving emissions reductions. The payment fee is based on the average cost to achieve one ton per day (tpd) of reductions based on the average cost for reductions over the previous year. Onroad reductions averaged (nominally) $44 million ($NO_X$ only) and off-road reductions averaged $36 million ($NO_X$ only) over the previous year, thus working out to approximately $40 million per one tpd of reductions. This rate roughly correlates to the average cost effectiveness of the Carl Moyer Incentive Program.

If DWR is successful in reaching what it regards as a satisfactory agreement with SMAQMD, DWR will enter into mitigation contracts with SMAQMD to reduce NO_X, PM, or ROG (as appropriate) emissions to the required levels. Such reductions may occur within the SMAQMD and/or within another air district within the SFNA. The required levels are:

- For emissions in excess of the federal *de minimis* threshold: **net zero (0)** (see Table 22-9).
- For emissions not in excess of *de minimis* thresholds but above the appropriate SMAQMD standards: **below the appropriate CEQA threshold levels** (see Table 22-8.)

Implementation of this mitigation would require DWR to adopt the following specific responsibilities.

- Consult with the SMAQMD in good faith with the intention of entering into a mitigation contract with SMAQMD for the HDLEVIP. For SIP purposes, the necessary reductions must be achieved (contracted and delivered) by the applicable year in question (i.e., emissions generated in year 2016 would need to be reduced offsite in 2016). Funding would need to be received prior to contracting with participants and should allow sufficient time to receive and process applications to ensure offsite reduction projects are funded and implemented prior to commencement of BDCP activities being reduced. This would roughly equate to the equivalent of two years prior to the required mitigation; additional lead time may be necessary depending on the level of offsite emission reductions required for a specific year. In negotiating the terms of the mitigation contract, DWR and SMAQMD should seek clarification and agreement on SMAQMD responsibilities, including the following.
    - Identification of appropriate offsite mitigation fees required for BDCP.
    - Timing required for obtaining necessary offsite emission credits.
    - Processing of mitigation fees paid by DWR.
    - Verification of emissions inventories submitted by DWR.
    - Verification that offsite fees are applied to appropriate mitigation programs within the SFNA.
- Quantify mitigation fees required to satisfy the appropriate reductions. As noted above, the payment fees may vary by year and are sensitive to the number of projects requiring

reductions within the SFNA. The schedule in which payments are provided to SMAQMD also influences overall cost. For example, a higher rate on a per-tonnage basis will be required for project elements that need accelerated equipment turn-over to achieve near-term reductions, whereas project elements that are established to contract to achieve far-term reductions will likely pay a lower rate on a per-tonnage basis.

- Develop a compliance program to calculate emissions and collect fees from the construction contractors for payment to SMAQMD. The program will require, as a standard or specification of their construction contracts with DWR, that construction contractors identify construction emissions and their share of required offsite fees, if applicable. Based on the emissions estimates, DWR will collect fees from the individual construction contractors (as applicable) for payment to SMAQMD. Construction contractors will have the discretion to reduce their construction emissions to the lowest possible level through additional onsite mitigation, as the greater the emissions reductions that can be achieved by onsite mitigation, the lower the required offsite fee. Acceptable options for reducing emissions may include use of late-model engines, low-emission diesel products, additional electrification or alternative fuels, engine-retrofit technology, and/or after-treatment products. All control strategies must be verified by SMAQMD.
- Conduct daily and annual emissions monitoring to ensure onsite emissions reductions are achieved and no additional mitigation payments are required. Excess offsite funds can be carried from previous to subsequent years in the event that additional reductions are achieved by onsite mitigation. At the end of the project, if it is determined that excess offset funds remain (outstanding contracts and administration over the final years of the contracts will be taken into consideration), SMAQMD and DWR shall determine the disposition of final funds (e.g., additional emission reduction projects to offset underperforming contracts, return of funds to DWR, etc.).

If a sufficient number of emissions reduction projects are not identified to meet the required performance standard, DWR will coordinate with SMAQMD to ensure the performance standards of achieving net zero (0) for emissions in excess of General Conformity *de minimis* thresholds (where applicable) and of achieving quantities below applicable CEQA thresholds for other pollutants not in excess of the *de minimis* thresholds but above CEQA thresholds are met.

Mitigation Measure AQ-1b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants

Should DWR be unable to enter into what they regard as a satisfactory agreement with SMAQMD as contemplated by Mitigation Measure AQ-1a, or should DWR enter into an agreement with SMAQMD but find themselves unable to meet the performance standards set forth in Mitigation Measure AQ-1a, DWR will develop an alternative or complementary offsite mitigation program to reduce criteria pollutant emissions generated by the construction of the water conveyance facilities associated with BDCP. The offsite mitigation program will offset criteria pollutant emissions to the required levels identified in Mitigation Measure AQ-1a. Accordingly, the program will ensure that the project does not contribute to or worsen existing air quality exceedances. Whether this program will address emissions beyond NO_X, PM, or ROG, will turn on whether DWR has achieved sufficient reductions of those pollutants pursuant to Mitigation Measure AQ-1a.

The offsite mitigation program will establish a program to fund emission reduction projects through grants and similar mechanisms. All projects must provide contemporaneous (occur in the same calendar year as the emission increases) and localized (i.e., within the SFNA) emissions benefit to the area of effect. DWR may identify emissions reduction projects through consultation with SMAQMD, other air districts within the SFNA, and ARB, as needed. Potential projects could include, but are not limited to the following.

- Alternative fuel, low-emission school buses, transit buses, and other vehicles.
- Diesel engine retrofits and repowers.
- Locomotive retrofits and repowers.
- Electric vehicle or lawn equipment rebates.
- Electric vehicle charging stations and plug-ins.
- Video-teleconferencing systems for local businesses.
- Telecommuting start-up costs for local businesses.

As part of its alternative or complementary offsite mitigation program, DWR will develop pollutant-specific formulas to monetize, calculate, and achieve emissions reductions in a cost-effective manner. Construction contractors, as a standard specification of their construction contracts with DWR, will identify construction emissions and their share of required offset fees. DWR will verify the emissions estimates submitted by the construction contractors and calculate the required fees. Construction contractors (as applicable) will be required to surrender required fees to DWR prior to the start of construction. Construction contractors will have the discretion to reduce their construction emissions to the lowest possible level through additional onsite mitigation, as the greater the emissions reductions that can be achieved by onsite mitigation, the lower the required offset fee. Acceptable options for reducing emissions may include, but are not limited to, the use of late-model engines, low-emission diesel products, additional electrification or alternative fuels, engine-retrofit technology, and/or after-treatment products. All control strategies must be verified by SMAQMD, the ARB, any relevant air pollution control or air quality management district within the SFNA, or by a qualified air quality expert employed by or retained by DWR.

The offsite fee, grant, or other mechanism will be calculated or formulated based on the actual cost of pollutant reductions. No collected offset fees will be used to cover administrative costs; offset fees or other payments are strictly limited to procurement of offsite emission reductions. Fees or other payments collected by DWR will be allocated to emissions reductions projects in a grant-like manner. DWR shall document the fee schedule basis, such as consistency with the ARB's Carl Moyer Program cost-effectiveness limits and capital recovery factors.

DWR will conduct annual reporting to verify and document that emissions reductions projects achieve a 1:1 reduction with construction emissions to ensure claimed offsets meet the required performance standard. All offsite reductions must be quantifiable, verifiable, enforceable, and satisfy the basic criterion of additionally (i.e., the reductions would not happen without the financial support of purchased offset credits). Annual reports will include, at a minimum the following components.

- Total amount of offset fees received.
- Total fees distributed to offsite projects.
- Total fees remaining.
- Projects funded and associated pollutant reductions realized.
- Total emission reductions realized.
- Total emissions reductions remaining to satisfy the requirements of Mitigation Measure AQ-1b.
- Overall cost-effectiveness of the projects funded.

If a sufficient number of emissions reduction projects are not identified to meet the required performance standard, DWR will consult with SMAQMD, the ARB, any relevant air pollution control or air quality management district within the SFNA, or a qualified air quality expert employed by or retained by DWR to ensure conformity is met through some other means of achieving the performance standards of achieving net zero (0) for emissions in excess of General Conformity *de minimis* thresholds (where applicable) and of achieving quantities below applicable CEQA thresholds for other pollutants.

Impact AQ-2: Generation of Criteria Pollutants in Excess of the YSAQMD Regional Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: As shown in Table 22-12, construction emissions would exceed YSAQMD regional thresholds for the following pollutants and years, even with implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*). All other pollutants would be below air district thresholds and therefore would not result in an adverse air quality effect.

- NO_X: 2022–2024
- PM10: 2022–2028

Since NO_X is a precursor to ozone and NO_X is a precursor to PM, exceedances of YSAQMD's NO_X threshold could impact both regional ozone and PM formation, which could worsen regional air quality and air basin attainment of the NAAQS and CAAQS. Similarly, exceedances of YSAQMD's PM10 threshold could impede attainment of the NAAQS and CAAQS for PM10. All emissions generated within YSAQMD are a result of haul truck movement for equipment and material delivery.

Environmental commitments outlined in Appendix 3B, *Environmental Commitments,* will reduce construction-related emissions; however, as shown in Table 22-12, NO_X and PM10 emissions would still exceed the applicable YSAQMD thresholds identified in Table 22-8 and result in an adverse regional effect to air quality. Mitigation Measures AQ-1a and AQ-1b are available to reduce NO_X and PM10 emissions, and would thus address regional effects related to secondary ozone and PM formation.

***CEQA Conclusion*:** Emissions of NO_X and PM10 generated during construction would exceed YSAQMD's regional thresholds identified in Table 22-8. Since NO_X is a precursor to ozone and NO_X is a precursor to PM, exceedances of YSAQMD's NO_X threshold could impact both regional ozone and PM formation, which could worsen regional air quality and air basin attainment of the NAAQS and CAAQS. Similarly, exceedances of YSAQMD's PM10 threshold could impede attainment of the NAAQS and CAAQS for PM10. YSAQMD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS or NAAQS. The impact of generating NO_X and PM10 in excess of local air district regional thresholds would therefore violate applicable air quality standards in the study area and could contribute to or worsen an existing air quality conditions. This would be a significant impact. Mitigation Measures AQ-1a and AQ-1b would be available to reduce NO_X and PM10 emissions to a less-than-significant level by offsetting emissions to quantities below YSAQMD CEQA thresholds (see Table 22-8).

Mitigation Measure AQ-1a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-1a under Impact AQ-1 in the discussion of Alternative 1A.

Mitigation Measure AQ-1b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-1b under Impact AQ-1 in the discussion of Alternative 1A.

Impact AQ-3: Generation of Criteria Pollutants in Excess of the BAAQMD Regional Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: As shown in Table 22-12, construction emissions would exceed BAAQMD's daily thresholds for the following pollutants and years, even with implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*). All other pollutants would be below air district thresholds and therefore would not result in an adverse air quality effect.

- ROG: 2023–2027
- NO_X: 2018–2029

Since ROG and NO_X are precursors to ozone and NO_X is a precursor to PM, exceedances of BAAQMD's ROG and NO_X thresholds could impact both regional ozone and PM formation, which could worsen regional air quality and air basin attainment of the NAAQS and CAAQS.

While equipment could operate at any work area identified for this alternative, the highest level of ROG and NO_X emissions in the BAAQMD are expected to occur at those sites where the duration and intensity of construction activities would be greatest, including the site of the Byron Tract Forebay adjacent to and south of Clifton Court Forebay.

Environmental commitments outlined in Appendix 3B, *Environmental Commitments,* will reduce construction-related emissions; however, as shown in Table 22-12, ROG and NO_X emissions would still exceed the applicable BAAQMD thresholds identified in Table 22-8 and result in an adverse regional effect to air quality. Mitigation Measures AQ-3a and AQ-3b are available to reduce ROG and NO_X emissions, and would thus address regional effects related to secondary ozone and PM formation.

***CEQA Conclusion*:** Emissions of ROG and NO_X generated during construction would exceed BAAQMD's regional thresholds identified in Table 22-8. Since ROG and NO_X are precursors to ozone and NO_X is a precursor to PM, exceedances of BAAQMD's ROG and NO_X thresholds could impact both regional ozone and PM formation. The BAAQMD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS or NAAQS. The impact of generating ROG and NO_X in excess of local air district regional thresholds would therefore violate applicable air quality standards in the study area and could contribute to or worsen an existing air quality conditions. This would be a significant impact. Mitigation Measures AQ-3a and AQ-3b would be available to reduce ROG and NO_X emissions to a less-than-significant level by offsetting emissions to quantities below BAAQMD CEQA thresholds (see Table 22-8).

Mitigation Measure AQ-3a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within BAAQMD/SFBAAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable BAAQMD CEQA Thresholds for Other Pollutants[18]

DWR will reduce criteria pollutant emissions generated by the construction of the water conveyance facilities associated with BDCP within the BAAQMD through the creation of offsetting reductions of emissions occurring within the SFBAAB. The preferred means of undertaking such offsite mitigation shall be through a partnership with the BAAQMD involving the payment of offsite mitigation fees. Criteria pollutants in excess of the federal *de minimis* thresholds shall be reduced to net zero (0) (see Table 22-9). Criteria pollutants not in excess of the *de minimis* thresholds, but above any applicable air pollution control or air quality management district CEQA thresholds[19] shall be reduced to quantities below the numeric thresholds (see Table 22-8).

DWR will undertake in good faith an effort to enter into a development mitigation contract with BAAQMD in order to reduce criteria pollutant emissions generated by the construction of the water conveyance facilities associated with BDCP within the BAAQMD. The preferred source of emissions reductions for NO_X, ROG, and PM shall be through contributions to BAAQMD's Carl Moyer Program and/or other BAAQMD incentive programs (e.g., TFCA).

If DWR is successful in reaching what it regards as a satisfactory agreement with BAAQMD, DWR will enter into mitigation contracts with BAAQMD to reduce NO_X, PM, or ROG (as appropriate) emissions to the required levels. Such reductions may occur within the SFBAAB. The required levels are:

- For emissions in excess of the federal *de minimis* threshold: **net zero (0)** (see Table 22-9).
- For emissions not in excess of *de minimis* thresholds but above the appropriate BAAQMD standards: **below the appropriate CEQA threshold levels** (see Table 22-8).

Implementation of this mitigation would require DWR adopt the following specific responsibilities.

---

[18] In the title of this mitigation measure, the phrase "for other pollutants" is intended to apply to other alternatives, where associated impacts to other pollutants may exceed thresholds other than NO_X.

[19] For example, NO_X emissions in a certain year may exceed BAAQMD's 54 pound per day CEQA threshold, but not the 100 ton annual *de minimis* threshold. According to Appendix G of the State CEQA Guidelines, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make determinations regarding the significance of an impact.

- Consult with the BAAQMD in good faith with the intention of entering into a mitigation contract with BAAQMD for the Carl Moyer Program and/or other BAAQMD emission reduction incentive program. For SIP purposes, the necessary reductions must be achieved (contracted and delivered) by the applicable year in question (i.e., emissions generated in year 2016 would need to be reduced offsite in 2016). Funding would need to be received prior to contracting with participants and should allow sufficient time to receive and process applications to ensure offsite reduction projects are funded and implemented prior to commencement of BDCP activities being reduced. In negotiating the terms of the mitigation contract, DWR and BAAQMD should seek clarification and agreement on BAAQMD responsibilities, including the following.
  - Identification of appropriate offsite mitigation fees required for BDCP.
  - Timing required for obtaining necessary offsite emission credits.
  - Processing of mitigation fees paid by DWR.
  - Verification of emissions inventories submitted by DWR.
  - Verification that offsite fees are applied to appropriate mitigation programs within the SFBAAB.
- Quantify mitigation fees required to satisfy the appropriate reductions. Funding for the emission reduction projects will be provided in an amount up to the emission reduction project cost-effectiveness limit set by for the Carl Moyer Program during the year that the emissions from construction are emitted. (The current emissions limit is $17,720 / weighted ton of criteria pollutants [NO_X + ROG + (20*PM)]). An administrative fee of 5% would be paid by DWR to the BAAQMD to implement the program. The funding would be used to fund projects eligible for funding under the Carl Moyer Program guidelines or other BAAQMD emission reduction incentive program meeting the same cost-effectiveness threshold that are real, surplus, quantifiable, and enforceable.
- Develop a compliance program to calculate emissions and collect fees from the construction contractors for payment to BAAQMD. The program will require, as a standard or specification of their construction contracts with DWR, that construction contractors identify construction emissions and their share of required offsite fees, if applicable. Based on the emissions estimates, DWR will collect fees from the individual construction contractors (as applicable) for payment to BAAQMD. Construction contractors will have the discretion to reduce their construction emissions to the lowest possible level through additional onsite mitigation, as the greater the emissions reductions that can be achieved by onsite mitigation, the lower the required offsite fee. Acceptable options for reducing emissions may include use of late-model engines, low-emission diesel products, additional electrification or alternative fuels, engine-retrofit technology, and/or after-treatment products. All control strategies must be verified by BAAQMD.
- Conduct daily and annual emissions monitoring to ensure onsite emissions reductions are achieved and no additional mitigation payments are required. Excess offsite funds can be carried from previous to subsequent years in the event that additional reductions are achieved by onsite mitigation. At the end of the project, if it is determined that excess offset funds remain (outstanding contracts and administration over the final years of the contracts will be taken into consideration), BAAQMD and DWR shall determine the disposition of final

funds (e.g., additional emission reduction projects to offset underperforming contracts, return of funds to DWR, etc.).

If a sufficient number of emissions reduction projects are not identified to meet the required performance standard, the DWR will coordinate with BAAQMD to ensure the performance standards of achieving net zero (0) for emissions in excess of General Conformity *de minimis* thresholds (where applicable) and of achieving quantities below applicable BAAQMD CEQA thresholds for other pollutants not in excess of the *de minimis* thresholds but above BAAQMD CEQA thresholds are met.

Mitigation Measure AQ-3b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the BAAQMD/SFBAAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable BAAQMD CEQA Thresholds for Other Pollutants

Should DWR be unable to enter into what they regard as a satisfactory agreement with BAAQMD as contemplated by Mitigation Measure AQ-3a, or should DWR enter into an agreement with BAAQMD but find themselves unable to meet the performance standards set forth in Mitigation Measure AQ-3a, DWR will develop an alternative or complementary offsite mitigation program to reduce criteria pollutant emissions generated by the construction of the water conveyance facilities associated with BDCP. The offsite mitigation program will offset criteria pollutant emissions to the required levels identified in Mitigation Measure AQ-3a. Accordingly, the program will ensure that the project does not contribute to or worsen existing air quality exceedances. Whether this program will address emissions beyond NO_X, PM, or ROG, will turn on whether DWR has achieved sufficient reductions of those pollutants pursuant to Mitigation Measure AQ-3a.

The offsite mitigation program will establish a program to fund emission reduction projects through grants and similar mechanisms. All projects must provide contemporaneous (occur in the same calendar year as the emission increases) and localized (i.e., within the SFBAAB) emissions benefit to the area of effect. DWR may identify emissions reduction projects through consultation with BAAQMD and ARB, as needed. Potential projects could include, but are not limited to the following.

- Alternative fuel, low-emission school buses, transit buses, and other vehicles.
- Diesel engine retrofits and repowers.
- Locomotive retrofits and repowers.
- Electric vehicle or lawn equipment rebates.
- Electric vehicle charging stations and plug-ins.
- Video-teleconferencing systems for local businesses.
- Telecommuting start-up costs for local businesses.

As part of its alternative or complementary offsite mitigation program, DWR will develop pollutant-specific formulas to monetize, calculate, and achieve emissions reductions in a cost-effective manner. Construction contractors, as a standard specification of their construction contracts with DWR, will identify construction emissions and their share of required offset fees.

DWR will verify the emissions estimates submitted by the construction contractors and calculate the required fees. Construction contractors (as applicable) will be required to surrender required fees to DWR prior to the start of construction. Construction contractors will have the discretion to reduce their construction emissions to the lowest possible level through additional onsite mitigation, as the greater the emissions reductions that can be achieved by onsite mitigation, the lower the required offset fee. Acceptable options for reducing emissions may include, but are not limited to, the use of late-model engines, low-emission diesel products, additional electrification or alternative fuels, engine-retrofit technology, and/or after-treatment products. All control strategies must be verified by BAAQMD, the ARB, or by a qualified air quality expert employed by or retained by DWR.

The offsite fee, grant, or other mechanism will be calculated or formulated based on the actual cost of pollutant reductions. No collected offset fees will be used to cover administrative costs; offset fees or other payments are strictly limited to procurement of offsite emission reductions. Fees or other payments collected by DWR will be allocated to emissions reductions projects in a grant-like manner. DWR shall document the fee schedule basis, such as consistency with the ARB's Carl Moyer Program cost-effectiveness limits and capital recovery factors.

DWR will conduct annual reporting to verify and document that emissions reductions projects achieve a 1:1 reduction with construction emissions to ensure claimed offsets meet the required performance standard. All offsite reductions must be quantifiable, verifiable, enforceable, and satisfy the basic criterion of additionally (i.e., the reductions would not happen without the financial support of purchased offset credits). Annual reports will include, at a minimum the following components.

- Total amount of offset fees received.
- Total fees distributed to offsite projects.
- Total fees remaining.
- Projects funded and associated pollutant reductions realized.
- Total emission reductions realized.
- Total emissions reductions remaining to satisfy the requirements of Mitigation Measure AQ-3b.
- Overall cost-effectiveness of the projects funded.

If a sufficient number of emissions reduction projects are not identified to meet the required performance standard, DWR will consult with BAAQMD, the ARB, or a qualified air quality expert employed by or retained by DWR to ensure conformity is met through some other means of achieving the performance standards of achieving net zero (0) for emissions in excess of General Conformity *de minimis* thresholds (where applicable) and of achieving quantities below applicable BAAQMD CEQA thresholds for other pollutants.

Impact AQ-4: Generation of Criteria Pollutants in Excess of the SJVAPCD Regional Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: As shown in Table 22-12, construction emissions would exceed SJVAPCD's annual thresholds for the following pollutants and years, even with implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*). All other pollutants would be below air district thresholds and therefore would not result in an adverse air quality effect.

- ROG: 2019–2025
- NO_X: 2019–2026
- PM10: 2019–2024

Since ROG and NO_X are precursors to ozone and NO_X is a precursor to PM, exceedances of SJVAPCD's ROG and NO_X thresholds could impact both regional ozone and PM formation, which could worsen regional air quality and air basin attainment of the NAAQS and CAAQS. Similarly, exceedances of SJVAPCD's PM10 threshold could impede attainment of the NAAQS and CAAQS for PM10.

While equipment could operate at any work area identified for this alternative, the highest level of ROG, NO_X, and PM10 emissions in the SJVAPCD is expected to occur at those sites where the duration and intensity of construction activities would be greatest. This includes all temporary and permanent utility sites, as well as all construction sites along the pipeline/tunnel conveyance alignment. For a map of the proposed tunnel alignment, see Mapbook Figure M3-1.

Environmental commitments outlined in Appendix 3B, *Environmental Commitments* will reduce construction-related emissions; however, as shown in Table 22-12, ROG, NO_X, and PM10 emissions would still exceed the applicable SJVAPCD thresholds identified in Table 22-8 and result in an adverse regional effect to air quality. Mitigation Measures AQ-4a and AQ-4b are available to reduce ROG, NO_X, and PM10 emissions, and would thus address regional effects related to secondary ozone and PM formation.

CEQA Conclusion**:** Emissions of ROG, NO_X, and PM10 generated during construction would exceed SJVAPCD's annual regional threshold identified in Table 22-8. Since ROG and NO_X are precursors to ozone and NO_X is a precursor to PM, exceedances of SJVAPCD's ROG and NO_X thresholds could impact both regional ozone and PM formation, which could worsen regional air quality and air basin attainment of the NAAQS and CAAQS. Similarly, exceedances of SJVAPCD's PM10 threshold could impede attainment of the NAAQS and CAAQS for PM10. SJVAPCD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS for ozone and PM. The impact of generating ROG, NO_X, and PM10 in excess of local air district thresholds would therefore violate applicable air quality standards in the study area and could contribute to or worsen an existing air quality conditions. This would be a significant impact. Mitigation Measures AQ-4a and AQ-4b would be available to reduce ROG, NO_X, and PM10 emissions to a less-than-significant level by offsetting emissions to quantities below SJVAPCD CEQA threshold (see Table 22-8).

Mitigation Measure AQ-4a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants[20]

DWR will reduce criteria pollutant emissions generated by the construction of the water conveyance facilities associated with BDCP within the SJVAPCD through the creation of offsetting reductions of emissions occurring within the SJVAB. The preferred means of undertaking such offsite mitigation shall be through a partnership with the SJVAPCD involving the payment of offsite mitigation fees. Criteria pollutants in excess of the federal *de minimis* thresholds shall be reduced to net zero (0) (see Table 22-9). Criteria pollutants not in excess of the *de minimis* thresholds, but above any applicable air pollution control or air quality management district CEQA thresholds[21] shall be reduced to quantities below the numeric thresholds (see Table 22-8).[22]

DWR will undertake in good faith an effort to enter into a development mitigation contract with SJVAPCD in order to reduce criteria pollutant emissions generated by the construction of the water conveyance facilities associated with BDCP within the SJVAPCD. The preferred source of emissions reductions for NO_X, PM, and ROG shall be through contributions to SJVAPCD's VERA. The VERA is implemented through the District Incentive Programs and is a measure to reduce project impacts under CEQA. The current VERA payment fee for construction emissions is $9,350 per ton of NO_X and $9,011 per ton of PM10. This is an estimated cost and may change in the future (e.g., future year payment fees for NO_X could be in excess of the current price of $9,350) and are sensitive to the number and type of projects requiring emission reductions within the same air basin (Siong pers. comm. 2012).

If DWR is successful in reaching what it regards as a satisfactory agreement with SJVAPCD, DWR will enter into mitigation contracts with SJVAPCD to reduce NO_X, PM, or ROG (as appropriate) emissions to the required levels. Such reductions must occur within the SJVAB. required levels are:

- For emissions in excess of the federal de minimis threshold: **net zero (0)**.
- For emissions not in excess of *de minimis* thresholds but above the SJVAPCD's standards: **below the appropriate CEQA threshold levels**.

Implementation of this measure would require DWR to adopt the following specific responsibilities.

- Consult with the SJVAPCD in good faith with the intention of entering into a mitigation contract with SJVAPCD for the VERA. For SIP purposes, the necessary reductions must be

[20] In the title of this mitigation measure, the phrase "for other pollutants" is intended to apply to other alternatives, where associated impacts to other pollutants may exceed thresholds other than NO_X.

[21] For example, PM10 emissions in a certain year may exceed SJVAPCD's 15 ton annual CEQA threshold, but not the 100 ton annual *de minimis* threshold. According to Appendix G of the State CEQA Guidelines, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make determinations regarding the significance of an impact.

[22] For example, emissions of NO_X generated by Alternative 1A both exceed the federal *de minimis* threshold for the SJVAB and the SJVAPCD's CEQA threshold. NO_X emissions must therefore be reduced to net zero (0).

achieved (contracted and delivered) by the applicable year in question (i.e., emissions generated in year 2016 would need to be reduced offsite in 2016). Funding would need to be received prior to contracting with participants and should allow sufficient time to receive and process applications to ensure offsite reduction projects are funded and implemented prior to commencement of BDCP activities being reduced. This would roughly equate to the equivalent of two months (2) prior to groundbreaking; additional lead time may be necessary depending on the level of offsite emission reductions required for a specific year. In negotiating the terms of the mitigation contract, DWR and SJVAPCD should seek clarification and agreement on SJVAPCD responsibilities, including the following.

- Identification of appropriate offsite mitigation fees required for BDCP.
- Processing of mitigation fees paid by DWR.
- Verification of emissions inventories submitted by DWR
- Verification that offsite fees are applied to appropriate mitigation programs within the SJVAB.

- Quantify mitigation fees required to satisfy the appropriate reductions. An administrative fee of 4% would be paid by DWR to the SJVAPCD to implement the program. As noted above, the payment fees may vary by year and are sensitive to the number of projects requiring reductions within the SJVAB.
- Develop a compliance program to calculate emissions and collect fees from the construction contractors for payment to SJVAPCD. The program will require, as a standard or specification of their construction contracts with DWR, that construction contractors identify construction emissions and their share of required offsite fees, if applicable. Based on the emissions estimates, DWR will collect fees from the individual construction contractors (as applicable) for payment to SJVAPCD. Construction contractors will have the discretion to reduce their construction emissions to the lowest possible level through additional onsite mitigation, as the greater the emissions reductions that can be achieved by onsite mitigation, the lower the required offsite fee. Acceptable options for reducing emissions may include use of late-model engines, low-emission diesel products, additional electrification or alternative fuels, engine-retrofit technology, and/or after-treatment products. All control strategies must be verified by SJVAPCD.
- Conduct daily and annual emissions monitoring to ensure onsite emissions reductions are achieved and no additional mitigation payments are required. Excess offsite funds can be carried from previous to subsequent years in the event that additional reductions are achieved by onsite mitigation. At the end of the project, if it is determined that excess offset funds remain (outstanding contracts and administration over the final years of the contracts will be taken into consideration), SJVAPCD and DWR shall determine the disposition of final funds (e.g., additional emission reduction projects to offset underperforming contracts, return of funds to DWR, etc.).

If a sufficient number of emissions reduction projects are not identified to meet the required performance standard, DWR will coordinate with SJVAPCD to ensure the performance standards of achieving net zero (0) for emissions in excess of General Conformity *de minimis* thresholds (where applicable) and of achieving quantities below applicable SJVAPCD CEQA thresholds for other pollutants not in excess of the *de minimis* thresholds but above SJVAPCD CEQA thresholds are met.

Mitigation Measure AQ-4b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Should DWR be unable to enter into what they regard as a satisfactory agreement with SJVAPCD as contemplated by Mitigation Measure AQ-4a, or should DWR enter into an agreement with SJVAPCD but find themselves unable to meet the performance standards set forth in Mitigation Measure AQ-4a, DWR will develop an alternative or complementary offsite mitigation program to reduce criteria pollutant emissions generated by the construction of the water conveyance facilities associated with BDCP. The offsite mitigation program will offset criteria pollutant emissions to the required levels identified in Mitigation Measure AQ-4a. Accordingly, the program will ensure that the project does not contribute to or worsen existing air quality exceedances. Whether this program will address emissions beyond NO_X, PM, or ROG, will turn on whether DWR has achieved sufficient reductions of those pollutants pursuant to Mitigation Measure AQ-4a.

The offsite mitigation program will establish a program to fund emission reduction projects through grants and similar mechanisms. All projects must provide contemporaneous (occur in the same calendar year as the emission increases) and localized (i.e., within the SJVAB) emissions benefit to the area of effect. DWR may identify emissions reduction projects through consultation with SJVAPCD and ARB, as needed. Potential projects could include, but are not limited to the following.

- Alternative fuel, low-emission school buses, transit buses, and other vehicles.
- Diesel engine retrofits and repowers.
- Locomotive retrofits and repowers.
- Electric vehicle or lawn equipment rebates.
- Electric vehicle charging stations and plug-ins.
- Video-teleconferencing systems for local businesses.
- Telecommuting start-up costs for local businesses.

As part of its alternative or complementary offsite mitigation program, DWR will develop pollutant-specific formulas to monetize, calculate, and achieve emissions reductions in a cost-effective manner. Construction contractors, as a standard specification of their construction contracts with DWR, will identify construction emissions and their share of required offset fees. DWR will verify the emissions estimates submitted by the construction contractors and calculate the required fees. Construction contractors (as applicable) will be required to surrender required fees to DWR prior to the start of construction. Construction contractors will have the discretion to reduce their construction emissions to the lowest possible level through additional onsite mitigation, as the greater the emissions reductions that can be achieved by onsite mitigation, the lower the required offset fee. Acceptable options for reducing emissions may include, but are not limited to, the use of late-model engines, low-emission diesel products, additional electrification or alternative fuels, engine-retrofit technology, and/or after-treatment products. All control strategies must be verified by SJVAPCD, the ARB, or by a qualified air quality expert employed by or retained by DWR.

The offsite fee, grant, or other mechanism will be calculated or formulated based on the actual cost of pollutant reductions. No collected offset fees will be used to cover administrative costs; offset fees or other payments are strictly limited to procurement of offsite emission reductions. Fees or other payments collected by DWR will be allocated to emissions reductions projects in a grant-like manner. DWR shall document the fee schedule basis, such as consistency with the ARB's Carl Moyer Program cost-effectiveness limits and capital recovery factors.

DWR will conduct annual reporting to verify and document that emissions reductions projects achieve a 1:1 reduction with construction emissions to ensure claimed offsets meet the required performance standard. All offsite reductions must be quantifiable, verifiable, enforceable, and satisfy the basic criterion of additionally (i.e., the reductions would not happen without the financial support of purchased offset credits). Annual reports will include, at a minimum the following components.

- Total amount of offset fees received.
- Total fees distributed to offsite projects.
- Total fees remaining.
- Projects funded and associated pollutant reductions realized.
- Total emission reductions realized.
- Total emissions reductions remaining to satisfy the requirements of Mitigation Measure AQ-4b.
- Overall cost-effectiveness of the projects funded.

If a sufficient number of emissions reduction projects are not identified to meet the required performance standard, DWR will consult with SJVAPCD, the ARB, or a qualified air quality expert employed by or retained by DWR to ensure conformity is met through some other means of achieving the performance standards of achieving net zero (0) for emissions in excess of General Conformity *de minimis* thresholds (where applicable) and of achieving quantities below applicable SJVAPCD CEQA thresholds for other pollutants.

Impact AQ-5: Generation of Criteria Pollutants in Excess of the SMAQMD Regional Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance in SMAQMD could include both routine activities and yearly maintenance. Daily activities at all pumping plants and intakes are covered by maintenance, management, repair, and operating crews. Yearly maintenance would include annual inspections, as well as tunnel dewatering and sediment removal (see Appendix 22A, *Air Quality Analysis Methodology,* for additional detail). The highest concentration of operational emissions in the SMAQMD are expected at intake and intake pumping plant sites along the east bank of the Sacramento River, as well as at the intermediate forebay (and pumping plant) site west of South Stone Lake and east of the Sacramento River. As shown in Table 22-13, operation and maintenance activities under Alternative 1A would not exceed SMAQMD's regional thresholds of significance (see Table 22-8). Accordingly, project operations would not contribute to or worsen existing air quality exceedances. There would be no adverse effect.

***CEQA Conclusion*:** Emissions generated during operation and maintenance activities would not exceed SMAQMD regional thresholds for criteria pollutants. The SMAQMD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district would therefore violate applicable air quality standards in the study area and could contribute to or worsen an existing air quality conditions. Because project operations would not exceed SMAQMD regional thresholds, the impact would be less than significant. No mitigation is required.

Impact AQ-6: Generation of Criteria Pollutants in Excess of the YSAQMD Regional Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Alternative 1A would not involve the construction of any permanent features in the YSAQMD that would require routine operations and maintenance. No operational emissions would be generated in the YSAQMD. Consequently, operation of Alternative 1A would neither exceed the YSAQMD thresholds of significance nor result in an adverse effect on air quality.

CEQA Conclusion**:** No operational or maintenance emissions generated by the alternative would occur in YSAQMD and, therefore, YSAQMD's regional thresholds would not be exceeded (see Table 22-8). This impact would be less than significant. No mitigation is required.

Impact AQ-7: Generation of Criteria Pollutants in Excess of the BAAQMD Regional Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance in BAAQMD could include annual inspections, as well as tunnel dewatering and sediment removal (see Appendix 22A, *Air Quality Analysis Methodology,* for additional detail). The highest concentration of operational emissions in the BAAQMD are expected at the Byron Tract Forebay (including control gates), which is adjacent to and south of Clifton Court Forebay. As shown in Table 22-13, operation and maintenance activities under Alternative 1A would not exceed BAAQMD's regional thresholds of significance (see Table 22-8). Thus, project operations would not contribute to or worsen existing air quality exceedances. There would be no adverse effect.

CEQA Conclusion**:** Emissions generated during operation and maintenance activities would not exceed BAAQMD regional thresholds for criteria pollutants. The BAAQMD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district thresholds would violate applicable air quality standards in the study area and could contribute to or worsen an existing air quality conditions. Because project operations would not exceed BAAQMD regional thresholds, the impact would be less than significant. No mitigation is required.

Impact AQ-8: Generation of Criteria Pollutants in Excess of the SJVAPCD Regional Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance in SJVAPCD could include annual inspections, tunnel dewatering, and sediment removal (see Appendix 22A, *Air Quality Analysis Methodology,* for additional detail). The highest concentration of operational emissions in the SJVPACD is expected at routine inspection sites along the pipeline/tunnel conveyance alignment. For a map of the proposed tunnel alignment, see Mapbook Figure M3-1. As shown in Table 22-13, operation and maintenance activities under Alternative 1A would not exceed SJVAPCD's regional thresholds of significance (see Table 22-8). Accordingly, project operations would not contribute to or worsen existing air quality exceedances. There would be no adverse effect.

***CEQA Conclusion*: Emissions generated during operation and maintenance activities would not exceed SJVAPCD's regional thresholds of significance. The SJVAPCD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district thresholds would violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Because project operations would not exceed SJVAPCD regional thresholds, the impact would be less than significant. No mitigation is required.Impact AQ-9: Exposure of Sensitive Receptors to Health Hazards from Localized Particulate Matter in Excess of SMAQMD's Health-Based Concentration Thresholds**

NEPA Effects: Respirable particulates pose a public health threat by bypassing the defenses within the mucous ciliary system and entering deep lung tissue. Particulates are derived from a variety of sources, including windblown dust and fuel combustion. As shown in Table 22-12, construction would increase PM10 and PM2.5 emissions in SMAQMD, which may pose inhalation-related health risks for receptors exposed to certain concentrations.

PM2.5 and PM10 concentrations at sensitive receptors locations were assessed using the EPA's AERMOD dispersion. The methodology described in Section 22.3.1.3 provides a more detailed summary of the approach used to conduct the analysis. Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, provides an in-depth discussion of the methodology and results.

Table 22-14 shows the highest predicted annual and daily (24-hour) PM10 and PM2.5 concentrations in SMAQMD. Exceedances of air district thresholds are shown in underline.

Table 22-14. Alternative 1A PM10 and PM2.5 Concentration Results in SMAQMD

	PM10		PM2.5	
Parameter	Annual (μg/m³)	24-Hour (μg/m³)	Annual (μg/m³)	24-Hour (μg/m³)
Maximum Value	0.5	11.0	0.09	1.7
SMAQMD Threshold	*1*	*2.5*	*0.6*	-

Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions,* includes modeling results for all receptors.
μg/m³ = micrograms per cubic meter

All estimated annual PM10 and PM2.5 concentrations would be less than SMAQMD's annual thresholds. However, as shown in Table 22-14, the maximum predicted 24-hour PM10 concentration exceeds SMAQMD's threshold of 2.5 μg/m³. Exceedances of the threshold would occur at 225 receptor locations near intakes and the intake work areas. The exceedances would be temporary and occur intermittently due to soil disturbance (primarily entrained road dust).

DWR has identified several environmental commitments to reduce construction-related particulate matter in the SMAQMD (see Appendix 3B, *Environmental Commitments*). Consistent with air district guidance, these commitments constitute mitigation measures which include implementation of all feasible onsite fugitive dust controls, such as regular watering. While these commitments will reduce localized particulate matter emissions, concentrations at adjacent receptor locations would still exceed SMAQMD's 24-hour PM10 threshold. Receptors exposed to PM10 concentrations in excess of SMAQMD's threshold could experience increased risk for adverse human health effects. Mitigation Measure AQ-9 is available to address this effect.

CEQA Conclusion: Respirable particulates pose a human health hazard by bypassing the defenses within the mucous ciliary system and entering deep lung tissue. Construction of Alternative 1A would result in the short-term exposure of sensitive receptors to annual concentrations of PM2.5 that are below the significance thresholds established by the SMAQMD. Accordingly, no significant localized impact would occur with respect to PM2.5.

A total of 225 receptor locations would be exposed to 24-hour PM10 concentrations that exceed SMAQMD's threshold. This is a significant impact. The exceedances would occur intermittently due to soil disturbance and during days with most intensive construction activities. The significant impacts at the receptor locations are therefore temporary.

Mitigation Measure AQ-9 outlines a tiered strategy to reduce PM concentrations and public exposure to significant health hazards. Specifically, DWR will utilize dust suppressants (Pennzsuppress) on all unpaved surfaces to control fugitive dust emissions. The suppressants would be used in place of water and have a control efficiency of approximately 85% (California Air Resources Board 2012b). If concentrations still exceed air district thresholds with application of suppressants, DWR will offer relocation assistance to affected receptors. If accepted, relocation would reduce this impact to less than significant. However, if landowners choose not to accept DWR's offer of relocation assistance, DWR will pave all areas in which vehicles travel. Paving roadways would reduce entrained road dust by approximately 99% (Countess Environmental 2006). PM concentrations with implementation of Mitigation Measure AQ-9 would be reduced to a less-than-significant level.

Mitigation Measure AQ-9: Implement Measures to Reduce Re-Entrained Road Dust and Receptor Exposure to PM2.5 and PM10

The project sponsor (DWR) would employ a tiered approach to reduce re-entrained road dust and receptor exposure to PM2.5 and PM10. The approach would be taken in following way:

- PM10 that could exceed the threshold at sensitive receptors will be further reduced by applying dust suppressants (Pennzsuppress);
- If additional dust suppressants eliminate the issue at all receptors no further mitigation is needed; if not, DWR will offer temporary relocation of the affected residence; if that is accepted no additional mitigation is required; if relocation is not accepted then;
- DWR will pave portions of the work sites until all exceedances are eliminated and impacts are determined to be less than significant.

Impact AQ-10: Exposure of Sensitive Receptors to Health Hazards from Localized Particulate Matter in Excess of YSAQMD's Health-Based Concentration Thresholds

NEPA Effects: As shown in Table 22-12, construction would increase PM10 and PM2.5 emissions in YSAQMD, which may pose inhalation-related health risks for receptors exposed to certain concentrations.

PM2.5 and PM10 concentrations at sensitive receptors locations were assessed using the EPA's AERMOD dispersion. The methodology described in Section 22.3.1.3 provides a more detailed summary of the approach used to conduct the analysis. Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, provides an in-depth discussion of the methodology and results.

As shown in Table 22-15, predicted PM2.5 and PM10 concentrations are less than YSAQMD's adopted thresholds. The project would also implement all air district recommended onsite fugitive dust controls, such as regular watering. Accordingly, this alternative's effect of exposure of sensitive receptors to localized particulate matter concentrations would not be adverse.

Table 22-15. Alternative 1A PM10 and PM2.5 Concentration Results in YSAQMD

	PM10		PM2.5	
Parameter	Annual (μg/m^3)	24-Hour (μg/m^3)	Annual (μg/m^3)	24-Hour (μg/m^3)
Maximum Value	0.3	7	0.04	1
YSAQMD Threshold	*20*	*50*	*12*	*35*

Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions,* includes modeling results for all receptors.
μg/m^3 = micrograms per cubic meter

CEQA Conclusion: Respirable particulates pose a human health hazard by bypassing the defenses within the mucous ciliary system and entering deep lung tissue. Construction of Alternative 1A would result in PM2.5 and PM10 concentrations at receptor locations that are below the significance thresholds adopted by the YSAQMD. As such, localized particulate matter concentrations at analyzed receptors would not result in significant human health impacts. No mitigation is required.

Impact AQ-11: Exposure of Sensitive Receptors to Health Hazards from Localized Particulate Matter in Excess of BAAQMD's Health-Based Concentration Thresholds

NEPA Effects: As shown in Table 22-12, construction would increase PM10 and PM2.5 emissions in BAAQMD, which may pose inhalation-related health risks for receptors exposed to certain concentrations.

PM2.5 and PM10 concentrations at sensitive receptors locations were assessed using the EPA's AERMOD dispersion. The methodology described in Section 22.3.1.3 provides a more detailed summary of the approach used to conduct the analysis. Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, provides an in-depth discussion of the methodology and results.

As shown in Table 22-16, maximum predicted PM2.5 concentrations are less than BAAQMD's adopted threshold. The project would also implement all air-district recommended onsite fugitive dust controls, such as regular watering. Accordingly, this alternative's effect of exposure of sensitive receptors to localized particulate matter concentrations would not be adverse.

Table 22-16. Alternative 1A PM10 and PM2.5 Concentration Results in BAAQMD

	PM10		PM2.5	
Parameter	Annual (μg/m^3)	24-Hour (μg/m^3)	Annual (μg/m^3)	24-Hour (μg/m^3)
Maximum Value	0.33	31	0.07	6
BAAQMD Threshold	-	-	*0.3*	-

Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions,* includes modeling results for all receptors.
μg/m^3 = micrograms per cubic meter

CEQA Conclusion: Respirable particulates pose a human health hazard by bypassing the defenses within the mucous ciliary system and entering deep lung tissue. Construction of Alternative 1A would result in PM2.5 and PM10 concentrations at receptor locations that are below the significance thresholds established by the BAAQMD. As such, localized particulate matter concentrations at analyzed receptors would not result in significant human health impacts. No mitigation is required.

Impact AQ-12: Exposure of Sensitive Receptors to Health Hazards from Localized Particulate Matter in Excess of SJVAPCD's Health-Based Concentration Thresholds

NEPA Effects: As shown in Table 22-12, construction would increase PM10 and PM2.5 emissions in SJVAPCD, which may pose inhalation-related health risks for receptors exposed to certain concentrations.

PM2.5 and PM10 concentrations at sensitive receptors locations were assessed using the EPA's AERMOD dispersion. The methodology described in Section 22.3.1.3 provides a more detailed summary of the approach used to conduct the analysis. Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, provides an in-depth discussion of the methodology and results.

As shown in Table 22-17, with the exception of 24-hour PM10, maximum predicted PM2.5 and PM10 concentrations are less than SJVAPCD's adopted thresholds. The estimated 24-hour PM10 concentration would exceed the SJVAPCD's significance threshold at four receptor locations. Emissions from the tunnel and concrete batch plant contribute to the exceedance at this location.

As discussed above, DWR has identified several environmental commitments to reduce construction-related particulate matter in the SJVAPCD (see Appendix 3B, *Environmental Commitments*). While these commitments will reduce localized particulate matter emissions, concentrations at the receptor locations would still exceed SJVAPCD's 24-hour PM10 threshold. The receptor exposed to PM10 concentrations in excess of SJVAPCD's threshold could experience increased risk for adverse human health effects. Mitigation Measure AQ-9 is available to address this effect.

Table 22-17. Alternative 1A PM10 and PM2.5 Concentration Results in SJVAPCD

	PM10		PM2.5	
Parameter	Annual (μg/m^3)	24-Hour (μg/m^3)	Annual (μg/m^3)	24-Hour (μg/m^3)
Maximum Value	0.1	<u>37.1</u>	0.07	6.1
SJVAPCD Threshold	*2.08*	*10.4*	*2.08*	*10.4*

Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions,* includes modeling results for all receptors.
μg/m^3 = micrograms per cubic meter

CEQA Conclusion: Respirable particulates pose a human health hazard by bypassing the defenses within the mucous ciliary system and entering deep lung tissue. Construction of Alternative 1A would result in PM10 concentrations at one receptor location that are above the significance thresholds established by the SJVAPCD. As such, localized particulate matter concentrations at analyzed receptors would result in significant human health impacts. Mitigation Measure AQ-9 outlines a tiered strategy to reduce PM10 concentrations and public exposure to a less-than-significant level.

Mitigation Measure AQ-9: Implement Measures to Reduce Re-Entrained Road Dust and Receptor Exposure to PM2.5 and PM10

Please see Mitigation Measure AQ-9 under Impact AQ-9 in the discussion of Alternative 1A.

Impact AQ-13: Exposure of Sensitive Receptors to Health Hazards from Localized Carbon Monoxide

NEPA Effects: Continuous engine exhaust may elevate localized CO concentrations. Receptors exposed to these CO "hot-spots" may have a greater likelihood of developing adverse health effects (as described in Section 22.1.2). CO hot-spots are typically observed at heavily congested intersections where a substantial number of gasoline-powered vehicles idle for prolonged durations throughout the day. Construction sites are less likely to result in localized CO hot-spots due to the nature of construction activities (Sacramento Metropolitan Air Quality Management District 2014), which normally utilize diesel-powered equipment for intermittent or short durations. Moreover, construction sites must comply with the Occupational Safety and Health Administration's (OSHA) CO exposure standards for onsite workers. Unlike regional pollutants (e.g., ROG and NO_X), CO concentrations also dissipate as a function of distance and will therefore be lower at offsite receptor locations. Accordingly, given that construction activities typically do not result in CO hot-spots, onsite concentrations must comply with OSHA standards, and CO levels dissipate as a function of distance, equipment-generated CO emissions (see Table 22-12) are not anticipated to result in adverse health hazards to sensitive receptors.

Construction traffic may contribute to increased roadway congestion, which could lead to conditions conducive to CO hot-spot formation. Chapter 19, *Transportation*, analyzes peak-hour traffic volumes during construction on local roadway segments. The assessment is inclusive of baseline traffic volumes plus background growth and project trips or 'baseline plus background growth plus project' (BPBGPP). While the traffic analysis was performed for roadway segments, as opposed to intersections, the results can be used as a conservative indication of potential traffic volumes at local intersections, assuming all vehicles would travel through a single intersection.

As shown in Table 19-8, the highest peak hour traffic volumes under BPBGPP—12,567 vehicles per hour—would occur on westbound Interstate 80 between Suisun Valley Road and State Route 12. This is about half of the congested traffic volume modeled by BAAQMD (24,000 vehicles per hour) that would be needed to contribute to a localized CO hot-spot, and less than half of the traffic volume modeled by SMAQMD (31,600 vehicles per hour). The BAAQMD's and SMAQMD's CO screening criteria were developed based on County average vehicle fleets that are primarily comprised of gasoline vehicles. Construction vehicles would be predominantly diesel trucks, which generate fewer CO emissions per idle-hour and vehicle mile traveled than gasoline-powered vehicles. Accordingly, the air district screening thresholds provide a conservative evaluation threshold for the assessment of potential CO emissions impacts during construction.

Based on the above analysis, even if all 12,567 vehicles on the modeled traffic segment drove through the same intersection in the peak hour, CO concentrations adjacent to the traveled way would not exceed the CAAQS or NAAQS according to BAAQMD's and SMAQMD's screening criteria. Thus, construction traffic is not anticipated to result in adverse health hazards to sensitive receptors.

***CEQA Conclusion*:** Continuous engine exhaust may elevate localized CO concentrations. Receptors exposed to these CO "hot-spots" may have a greater likelihood of developing adverse health effects.

Construction sites are less likely to result in localized CO hot-spots due to the nature of construction activities (Sacramento Metropolitan Air Quality Management District 2014), which normally utilize diesel-powered equipment for intermittent or short durations. Moreover, construction sites must comply with the OSHA CO exposure standards for onsite workers. Accordingly, given that construction activities typically do not result in CO hot-spots, onsite concentrations must comply with OSHA standards, and CO levels dissipate as a function of distance, equipment-generated CO emissions are not anticipated to result in significant health hazards to sensitive receptors. Similarly, peak-hour construction traffic on local roadways would not exceed BAAQMD's or SMAQMD's conservative screening criteria for the formation potential CO hot-spots. This impact would be less than significant. No mitigation is required.

Impact AQ-14: Exposure of Sensitive Receptors to Health Hazards from Diesel Particulate Matter in Excess of SMAQMD's Chronic Non-Cancer and Cancer Risk Thresholds

NEPA Effects: Diesel-fueled engines, which generate DPM, would be used during construction of the proposed water conveyance facility. These coarse and fine particles may be composed of elemental carbon with adsorbed materials, such as organic compounds, sulfate, nitrate, metals, and other trace elements. The coarse and fine particles are respirable, which means that they can avoid many of the human respiratory system's defense mechanisms and enter deeply into the lungs, and as such, DPM poses inhalation-related chronic non-cancer hazard and cancer risk.[23]

As shown in Table 22-12, construction would increase DPM emissions in SMAQMD, particularly near sites involving the greatest duration and intensity of equipment activities. Receptor exposure to construction DPM emissions was assessed by predicting the health risks in terms of excess cancer and non-cancer hazard impacts using the EPA's AERMOD dispersion modeling and guidance published by OEHHA. The methodology described in Section 22.3.1.3 provides a more detailed summary of the approach used to conduct the HRA. Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, also provides an in-depth discussion of the HRA methodology and results.

The results of the HRA are summarized in Table 22-18 and are compared to SMAQMD's health risk thresholds. As shown in Table 22-18, Alternative 1A would not exceed the SMAQMD's thresholds for chronic non-cancer hazard or cancer risk. Therefore, the impact from DPM emissions would be less than significant. No mitigation is required.

***CEQA Conclusion*:** DPM generated during construction poses inhalation-related chronic non-cancer hazard and cancer risk if adjacent receptors are exposed to significant concentrations for prolonged durations. The DPM generated during Alternative 1A construction would not exceed the SMAQMD's chronic non-cancer hazard or cancer risk threshold. Therefore, this impact would be less than significant. No mitigation is required.

[23] The background cancer inhalation risk for all toxic air pollutants in the Study area ranges from 32 to 44 excess cancers per million people (2005 estimate) (U.S. Environmental Protection Agency 2014f). For context, smoking causes 636 excess lung cancer deaths per million men (390 excess deaths per million women), and countless more non-death related cancer cases (American Lung Association 2012).

Table 22-18. Alternative 1A Health Hazards from DPM Exposure in the Sacramento Metropolitan Air Quality Management District

Alternative 1A	Chronic Health Hazard	Cancer Health Risk
Maximum Value	0.003	9 per million
SMAQMD Thresholds	*1*	*10 per million*

Source: Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*.

Impact AQ-15: Exposure of Sensitive Receptors to Health Hazards from Diesel Particulate Matter in Excess of YSAQMD's Chronic Non-Cancer and Cancer Risk Thresholds

NEPA Effects: As shown in Table 22-12, construction of Alternative 1A would increase DPM emissions in YSAQMD, which poses inhalation-related chronic non-cancer hazard and cancer risks if adjacent receptors are exposed to significant DPM concentrations for prolonged durations.

Receptor exposure to construction DPM emissions was assessed by predicting the health risks in terms of excess cancer and non-cancer hazard impacts using the EPA's AERMOD dispersion modeling and guidance published by OEHHA. Based on HRA results detailed in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions,* Alternative 1A would not exceed YSAQMD's non-cancer or cancer health thresholds (see Table 22-19) and, thus, would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to DPM and health hazards during construction would not be adverse.

***CEQA Conclusion*:** DPM generated during construction poses inhalation-related chronic non-cancer hazard and cancer risk if adjacent receptors are exposed to significant concentrations for prolonged durations. The DPM generated during Alternative 1A construction would not exceed the YSAQMD's chronic non-cancer or cancer thresholds. As such, construction emissions would not expose sensitive receptors to substantial health hazards. Therefore, the impact from DPM emissions would be less than significant. No mitigation is required.

Table 22-19. Alternative 1A Health Hazards from DPM Exposure in the Yolo-Solano Air Quality Management District

Alternative 1A	Chronic Health Hazard	Cancer Health Risk
Maximum Value	0.002	5 per million
YSAQMD Thresholds	*1*	*10 per million*

Source: Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*

Note: Emissions would not be generated in Yolo County. However, emissions from the adjacent Sacramento County could affect sensitive receptors in Yolo County.

Impact AQ-16: Exposure of Sensitive Receptors to Health Hazards from Diesel Particulate Matter in Excess of BAAQMD's Chronic Non-Cancer and Cancer Risk Thresholds

NEPA Effects: As shown in Table 22-12, construction would increase DPM emissions in the BAAQMD, particularly near sites involving the greatest duration and intensity of construction activities. DPM poses inhalation-related chronic non-cancer hazard and cancer risks if adjacent receptors are exposed to significant DPM concentrations for prolonged durations.

Receptor exposure to construction DPM emissions was assessed by predicting the health risks in terms of excess cancer and non-cancer hazard impacts using the EPA's AERMOD dispersion modeling and guidance published by OEHHA. Based on the HRA results detailed in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, Alternative 1A would not exceed the BAAQMD's chronic non-cancer thresholds (see Table 1A-20). However, BAAQMD's cancer risk threshold would be exceeded at eight receptor locations due to proximity to a project haul route, control structure work area, and potential spoil area.

As discussed above, DWR has identified several environmental commitments to reduce construction-related diesel particulate matter in the BAAQMD (see Appendix 3B, *Environmental Commitments*). While these commitments will reduce localized DPM emissions, cancer risk levels were found to exceed the significance threshold at eight analyzed receptors. Therefore, this alternative's effect of exposure of sensitive receptors to DPM-related health hazards during construction would be adverse.

Mitigation Measure AQ-16 would be available to reduce exposure to substantial cancer risk by relocating affected receptors. Although Mitigation Measure AQ-16 would reduce the severity of this effect, the BDCP proponents are not solely responsible for implementation of the measure. If a landowner chooses not to accept DWR's offer of relocation assistance, an adverse effect in the form excess cancer risk above air district thresholds would occur. Therefore, this effect would be adverse. If, however, all landowners accept DWR's offer of relocation assistance, effects would not be adverse.

***CEQA Conclusion*:** DPM generated during construction poses inhalation-related chronic non-cancer hazard and cancer risk if adjacent receptors are exposed to significant concentrations for prolonged durations. The DPM generated during Alternative 1A construction would not exceed the BAAQMD's chronic non-cancer hazard threshold; however, it would exceed the BAAQMD's cancer thresholds at six receptor locations. Therefore, this impact would be significant. Mitigation Measure AQ-16 would be available to reduce exposure to substantial cancer risk by relocating affected receptors. Although Mitigation Measure AQ-16 would reduce the severity of this effect, the BDCP proponents are not solely responsible for implementation of the measure. If a landowner chooses not to accept DWR's offer of relocation assistance, a significant impact in the form excess cancer risk above air district thresholds would occur. Therefore, this effect would be significant and unavoidable. If, however, all landowners accept DWR's offer of relocation assistance, the impact would be less than significant.

Mitigation Measure AQ-16: Relocate Sensitive Receptors to Avoid Excess Cancer Risk

To avoid exposing sensitive receptors to substantial DPM concentrations, DWR will provide individuals residing in areas where construction activities associated with the BDCP would create DPM concentrations in excess of air district cancer risk thresholds the opportunity to relocate either temporarily during the construction period or permanently, at the discretion of the affected individuals. DWR will provide any individuals who accept DWR's offer of relocation full compensation for expenses related to the procurement of either (i) temporary housing during the period in which DPM concentrations exceed air district thresholds or permanent replacement housing of the same market value as the housing being vacated by the residents or greater. Under either scenario, DWR will provide, in compliance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act and the California Relocation Assistance

Act, relocation and replacement expenses, including relocation advisory services, moving cost reimbursement, and reimbursement for related expenses. Implementation of this mitigation measure will ensure that sensitive receptors will not be exposed to excess cancer risk in exceedance of air district thresholds, unless they freely choose not to accept to DWR's offer of relocation assistance.

Table 22-20. Alternative 1A Health Hazards from DPM Exposure in the Bay Area Air Quality Management District

Alternative 1A	Chronic Health Hazard	Cancer Health Risk
Maximum Value	0.004	13 per million
BAAQMD Thresholds	*1*	*10 per million*

Source: Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*.

Impact AQ-17: Exposure of Sensitive Receptors to Health Hazards from Diesel Particulate Matter in Excess of SJVAPCD's Chronic Non-Cancer and Cancer Risk Thresholds

NEPA Effects: As shown in Table 22-12, construction would increase DPM emissions in the SJVAPCD, particularly near sites involving the greatest duration and intensity of construction activities. DPM poses inhalation-related chronic non-cancer hazard and cancer risks if adjacent receptors are exposed to significant DPM concentrations for prolonged durations.

Receptor exposure to construction DPM emissions was assessed by predicting the health risks in terms of excess cancer and non-cancer hazard impacts using the EPA's AERMOD dispersion modeling and guidance published by OEHHA. Based on the HRA results detailed in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, Alternative 1A would not exceed the SJVAPCD's chronic non-cancer or cancer thresholds (see Table 22-21) and, thus, would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to DPM emissions and their health hazards during construction would not be adverse.

***CEQA Conclusion*:** DPM generated during construction poses inhalation-related chronic non-cancer hazard and cancer risk if adjacent receptors are exposed to significant concentrations for prolonged durations. The DPM generated during Alternative 1A construction would not exceed the SJVAPCD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial health hazards. Therefore, this impact for DPM emissions would be less than significant. No mitigation is required.

Table 22-21. Alternative 1A Health Hazards from DPM Exposure in the San Joaquin Valley Air Pollution Control District

Alternative 1A	Chronic Health Hazard	Cancer Health Risk
Maximum Value	0.0010	3 per million
SJVAPCD Thresholds	*1*	*10 per million*

Source: Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*

Impact AQ-18: Exposure of Sensitive Receptors to *Coccidioides immitis* (Valley Fever)

NEPA Effects**:** Disturbance of soil containing *C. immitis* could expose the receptors adjacent to the construction site to spores known to cause Valley Fever. Areas endemic to *C. immitis* are generally arid to semiarid with low annual rainfall, and as such, soil containing the fungus is commonly found in Southern California and throughout the Central Valley. Table 22-22 summarizes Valley Fever hospitalization rates between 2002 and 2010 in affected California counties and indicates that over 60% of Valley Fever cases have been in people who live in the San Joaquin Valley. Within the Plan Area, San Joaquin County has the highest hospitalization rate due to Valley Fever and is the 8th most affected county in the State. By comparison, hospitalization rates in Sacramento and Contra Costa counties are relatively low.

Table 22-22. Valley Fever Hospitalizations (2002–2010)

Region	County	Number of Cases	Percent of State Cases	Relative State Rank[a]
Northern California	Alameda	107	2%	11
	Contra Costa	106	2%	12
	Monterey	102	2%	13
	Sacramento	65	1%	16
	San Francisco	35	1%	19
	Solano	36	1%	18
	Total Northern California	**451**	**7%**	**-**
Southern California	Imperial	20	0%	20
	Los Angeles	852	14%	2
	Orange	140	2%	10
	Riverside	310	5%	7
	San Bernardino	181	3%	9
	San Diego	313	5%	6
Total Southern California		2,267	38%	-
San Joaquin Valley	Fresno	681	11%	3
	Kern	1,810	30%	1
	Kings	345	6%	5
	Madera	55	1%	17
	Merced	81	1%	15
	San Joaquin	238	4%	8
	Stanislaus	93	2%	14
	Tulare	447	7%	4
Total San Joaquin Valley		3,750	62%	-
Total California		6,017	100%	-

Note: Counties in the CM1 construction work area are shown in underline.

Source: Lighthouse pers. comm.

[a] State ranking presented in descending order, where counties with the highest number of cases are have the lowest rank (e.g., Kern County with 1,810 cases is ranked #1 in the State for Valley Fever hospitalizations).

The presence of *C. immitis* in the Plan Area does not guarantee that CM1 construction activities would result in increased incidence of Valley Fever. Propagation of *C. immitis* is dependent on climatic conditions, with the potential for growth and surface exposure highest following early seasonal rains and long dry spells. *C. immitis* spores can be released when filaments are disturbed by earthmoving activities, although receptors must be exposed to and inhale the spores to be at increased risk of developing Valley Fever. Moreover, exposure to *C. immitis* does not guarantee that an individual will become ill—approximately 60 percent of people exposed to the fungal spores are asymptomatic and show no signs of an infection (United States Geological Survey 2000).

While there are a number of factors that influence receptor exposure and development of Valley Fever, earthmoving activities during construction could release *C. immitis* spores if filaments are present and other soil chemistry and climatic conditions are conducive to spore development. Receptors adjacent to the construction area may therefore be exposed to increase risk of inhaling *C. immitis* spores and subsequent development of Valley Fever. Dust-control measures are the primary defense against infection (United States Geological Survey 2000). Implementation of advanced air-district recommended fugitive dust controls outlined in Appendix 3B, *Environmental Commitments*, would avoid dusty conditions and reduce the risk of contracting Valley Fever through routine watering and other controls. Therefore, this alternative's effect of exposure of sensitive receptors to increased Valley Fever risk during construction would not be adverse.

***CEQA Conclusion*:** Construction of the water conveyance facility would involve earthmoving activities that could release *C. immitis* spores if filaments are present and other soil chemistry and climatic conditions are conducive to spore development. Receptors adjacent to the construction area may therefore be exposed to increase risk of inhaling *C. immitis* spores and subsequent development of Valley Fever. Implementation of air-district recommended fugitive dust controls outlined in Appendix 3B, *Environmental Commitments*, would avoid dusty conditions and reduce the risk of contracting Valley Fever through routine watering and other controls. Therefore, this impact would be less than significant. No mitigation is required.

Impact AQ-19: Creation of Potential Odors Affecting a Substantial Number of People during Construction or Operation of the Proposed Water Conveyance Facility

NEPA Effects: The generation and severity of odors is dependent on a number of factors, including the nature, frequency, and intensity of the source; wind direction; and the location of the receptor(s). Odors rarely cause physical harm, but can cause discomfort, leading to complaints to regulatory agencies.

Sources of odor during construction include diesel exhaust from construction equipment, asphalt paving, and excavated organic matter from the removal of RTM and sediment. All air districts in the Plan Area have adopted rules that limits the amount of ROG emissions from cutback asphalt (see Section 22.2.3). Accordingly, potential odors generated during asphalt paving would be addressed through mandatory compliance with air district rules (YSAQMD Rule 2.28, SMAQMD Rule 453, BAAQMD Regulation 8, Rule 15, SJVAPCD Rule 4641). Odors from equipment exhaust would be localized and generally confined to the immediate area surrounding the construction site. These odors would be temporary and localized, and they would cease once construction activities have been completed. Thus, it is not anticipated that construction of CM1 would create objectionable odors from construction equipment or asphalt paving.

Construction of the water conveyance facility would require removal of subsurface material during tunnel excavation and sediment removal. Approximately 27 million cubic yards of saturated RTM would result from tunnel boring activities. If present in the RTM and sediment, anaerobic decay of organic material can generate gases, specifically hydrogen sulfide. Hydrogen sulfide is commonly described as having a foul or "rotten egg" smell (Occupational Safety and Health Administration 2005).

Geotechnical tests indicate that soils in the Plan Area have a high moisture content generally ranging about 38 to 41 percent. Testing shows that soils in the Plan Area are predominately comprised of silt and clay, with a variety of inorganic materials that are not anticipated to result in malodors. The majority of test results for organic constituents and VOC were below the method detection limits, indicating that organic decay of exposed RTM and sediment will be relatively low (URS 2014). Moreover, drying and stockpiling of the removed RTM and sediment will occur under aerobic conditions, which will further limit any potential decomposition and associated malodorous products. Accordingly, it is not anticipated that tunnel and sediment excavation would create objectionable odors.

Typical facilities known to produce odors include landfills, wastewater treatment plants, food processing facilities, and certain agricultural activities. Alternative 1A would not result in the addition of facilities associated with odors, and as such, long-term operation of the water conveyance facility would not result in objectionable odors.

***CEQA Conclusion*:** Alternative 1A would not result in the addition of major odor producing facilities. Diesel emissions during construction could generate temporary odors, but these would quickly dissipate and cease once construction is completed. Likewise, potential odors generated during asphalt paving would be addressed through mandatory compliance with air district rules and regulations. While tunnel excavation would unearth approximately 27 million cubic yards of RTM, geotechnical tests indicate that soils in the Plan Area have relatively low organic constituents. Moreover, drying and stockpiling of the removed RTM will occur under aerobic conditions, which will further limit any potential decomposition and associated malodorous products. Accordingly, the impact of exposure of sensitive receptors to potential odors would be less than significant. No mitigation is required.

Impact AQ-20: Generation of Criteria Pollutants in the Excess of Federal *De Minimis* Thresholds from Construction and Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: EPA's General Conformity Rule (40 CFR Parts 51 and 93) only applies to Federal actions that are taken in EPA-designated "nonattainment" or "maintenance" areas. Accordingly, as outlined in Section III.A of the General Conformity Rule, "only actions which cause emissions in designated nonattainment and maintenance areas are subject to the regulations". Criteria pollutant emissions resulting from construction and operation of Alternative 1A in nonattainment and maintenance areas of the SFNA, SJVAB, and SFBAAB are presented in Table 22-23. Exceedances of the federal *de minimis* thresholds are shown in underlined text.

Sacramento Federal Nonattainment Area

As shown in Table 22-23, implementation of Alternative 1A would exceed the following SFNA federal *de minimis* thresholds:

- ROG: 2023–2027
- NO_X: 2018–2028

- PM10: 2023–2024

ROG and NO_X are precursors to ozone and NO_X is a precursor to PM, for which the SFNA is in nonattainment for the NAAQS. Sacramento County is also a maintenance area for the PM10 NAAQS. Since project emissions exceed the federal *de minimis* thresholds for ROG, NO_X, and PM10, a general conformity determination must be made to demonstrate that total direct and indirect emissions of ROG, NO_X, and PM10 would conform to the appropriate SFNA SIP for each year of construction in which the *de minimis* thresholds are exceeded.

NO_X is also a precursor to PM and can contribute to PM formation. As discussed above, Sacramento County is currently designated maintenance for the PM10 NAAQS and portions of the SVAB are designated nonattainment for the PM2.5 NAAQS. NO_X emissions in excess of 100 tons per year in Sacramento County trigger a secondary PM10 precursor threshold, whereas NO_X emissions in excess of 100 tons per year in the SVAB trigger a secondary PM2.5 precursor threshold. Since NO_X emissions can contribute to PM formation, NO_X emissions in excess of these secondary precursor thresholds could conflict with the applicable PM10 and PM2.5 SIPs. Accordingly, NO_X offsets pursued for the purposes of general conformity for those years in which NO_X emissions exceed 100 tons must occur within the federally designated PM2.5 nonattainment and PM10 maintenance areas of the SVAB.

As shown in Table 22-12, NO_X emissions generated by construction activities in SMAQMD (Sacramento County) would exceed 100 tons per year between 2022 and 2027. The project therefore triggers the secondary PM10 precursor threshold, requiring all NO_X offsets for 2022 through 2027 to occur within Sacramento County. The project also triggers the secondary PM2.5 precursor threshold in 2021, requiring all NO_X offsets for 2021 to occur within the federally designated PM2.5 nonattainment area within the SFNA. The nonattainment boundary for PM2.5 includes all of Sacramento County and portions of Yolo, El Dorado, Solano, and Placer counties.

Given the magnitude of NO_X emissions and the limited geographic scope available for offsets in 2022 through 2027 (Sacramento County), neither Mitigation Measures AQ-1a nor 1b could feasibly reduce NO_X emissions to net zero for the purposes of general conformity.[24] This impact would be adverse. In the event that Alternative 1A is selected as the APA, Reclamation, USFWS, and NMFS would need to demonstrate that conformity is met for NO_X and secondary PM10 formation through a local air quality modeling analysis (i.e., dispersion modeling) or other acceptable methods to ensure project emissions do not cause or contribute to any new violations of the NAAQS or increase the frequency or severity of any existing violations.

Mitigation Measure AQ-1a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-1a under Impact AQ-1 in the discussion of Alternative 1A.

[24] The secondary PM precursor thresholds are triggered through the General Conformity Regulation (40 CFR 93.153 (a)(1)). Accordingly, confinement of the geographic scope for available offsets only applies to the General Conformity determination and does not influence mitigation feasibility for Impacts AQ-1 or AQ-28.

Mitigation Measure AQ-1b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-1b under Impact AQ-1 in the discussion of Alternative 1A.

Table 22-23. Criteria Pollutant Emissions from Construction and Operation of Alternative 1A in Nonattainment and Maintenance Areas of the SFNA, SJVAB, and SFBAAB (tons/year)

			Sacramento Federal Nonattainment Area			
Year	ROG	NO_X[a]	CO[b]	PM10[c]	PM2.5	SO_2
2016	0	0	0	0	0	0
2017	0	0	0	0	0	0
2018	3	28	<1	11	2	<1
2019	4	27	<1	25	4	<1
2020	9	71	1	36	6	<1
2021	11	101	3	51	8	<1
2022	17	152	7	73	12	1
2023	37	299	7	111	19	2
2024	46	361	7	135	24	2
2025	35	257	4	90	17	1
2026	32	223	4	80	16	1
2027	28	215	4	91	17	1
2028	8	62	5	36	7	<1
2029	<1	3	<1	3	<1	<1
ELT	0.21	1.24	2.60	0.42	0.12	0.01
LLT	0.18	1.05	2.48	0.41	0.11	0.01
De Minimis	*25*	*25*	*100*	*100*	*100*	*100*
			San Joaquin Valley Air Basin			
Year	ROG	NO_X[a]	CO[b]	PM10	PM2.5	SO_2
2016	0	0	0	2	<1	0
2017	0	0	0	0	0	0
2018	2	7	<1	12	2	<1
2019	11	81	<1	19	3	<1
2020	20	139	<1	36	6	<1
2021	30	217	<1	58	9	1
2022	28	185	<1	35	6	1
2023	25	151	<1	19	4	1
2024	24	139	<1	18	4	<1
2025	15	92	<1	14	3	<1
2026	6	37	<1	3	1	<1
2027	<1	<1	<1	1	1	<1
2028	0	0	0	0	0	0
2029	0	0	0	0	0	0
ELT	0.01	0.07	0.13	0.02	<0.01	<0.01
LLT	0.01	0.06	0.12	0.01	<0.01	<0.01
De Minimis	*10*	*10*	*100*	*100*	*100*	*100*

San Francisco Bay Area Air Basin						
Year	ROG	NO_X[a]	CO[b]	PM10[d]	PM2.5	SO_2
2016	0	0	0	-	0	0
2017	0	0	0	-	0	0
2018	<1	2	<1	-	<1	<1
2019	2	18	1	-	1	<1
2020	4	29	1	-	1	<1
2021	5	38	2	-	2	<1
2022	5	44	4	-	3	<1
2023	9	67	6	-	6	1
2024	12	92	6	-	7	1
2025	8	57	4	-	5	1
2026	6	44	4	-	4	<1
2027	3	24	3	-	3	<1
2028	<1	3	1	-	1	<1
2029	<1	<1	<1	-	<1	<1
ELT	0.01	0.08	0.14	-	0.01	<0.01
LLT	0.01	0.07	0.14	-	0.01	<0.01
De Minimis	*100*	*100*	*100*	-	*100*	*100*

Notes

[a] NO_X emissions in excess of 100 tons per year within federally designated PM10 and PM2.5 nonattainment or maintenance areas trigger a secondary PM10 and PM2.5 precursor threshold. NO_X emissions in excess of this secondary threshold could conflict with the applicable PM10 and PM2.5 SIPs. Accordingly, NO_X offsets pursued for the purposes of general conformity for those years in which NO_X emissions exceed 100 tons must occur within the federally designated PM2.5 nonattainment and PM10 maintenance areas, as applicable.

[b] The proposed water conveyance facility is located within a federally designated CO attainment area. Accordingly, CO emissions generated by construction of CM1 are not subject to the General Conformity Rule and are excluded from the emissions summary and general conformity analysis (40 CFR Part 51 and 93, Section III.A). Emissions presented in the table are limited those generated by haul trucks, which would occur in federally designated CO maintenance area.

[c] There are no federally designated PM10 maintenance areas in Yolo County. Accordingly, PM10 emissions generated by construction of CM1 in Yolo County are not subject to the General Conformity Rule and are excluded from the emissions summary and general conformity analysis for the SFNA (40 CFR Part 51 and 93, Section III.A). Emissions presented in the table are limited those generated within Sacramento County.

[d] There are no federally designated PM10 nonattainment or maintenance areas in the SFBAAB. Accordingly, PM10 emissions generated by construction of CM1 are not subject to the General Conformity Rule and are excluded from the emissions summary and general conformity analysis (40 CFR Part 51 and 93, Section III.A).

San Joaquin Valley Air Basin

As shown in Table 22-23, implementation of Alternative 1A would exceed the following SJVAB federal *de minimis* thresholds:

- ROG: 2019–2025
- NO_X: 2019–2026

ROG and NO_X are precursors to ozone and NO_X is a precursor to PM, for which the SJVAB is in nonattainment for the NAAQS. Since project emissions exceed the federal *de minimis* threshold for ROG and NO_X, a general conformity determination must be made to demonstrate that total direct and indirect emissions of ROG and NO_X would conform to the appropriate SJVAB SIP for each year of construction in which the *de minimis* thresholds are exceeded.

NO_X is also a precursor to PM and can contribute to PM formation. As discussed above, the SJVAB is currently designated maintenance for the PM10 NAAQS and nonattainment for the PM2.5 NAAQS. NO_X emissions in excess of 100 tons per year trigger a secondary PM precursor threshold, and could conflict with the applicable PM10 and PM2.5 SIPs. As shown in Table 22-23, NO_X emissions generated by construction activities in the SJVAB would exceed 100 tons per year between 2020 and 2024. NO_X offsets pursued for the purposes of general conformity for those years in which NO_X emissions exceed 100 tons must occur within the federally designated PM2.5 nonattainment and PM10 maintenance areas of the SJVAB, which are consistent with the larger nonattainment boundary for ozone.

As shown in Appendix 22E, *General Conformity Determination,* Attachment 22E-1, SJVAPCD confirms that sufficient emissions reduction credits would be available to fully offset ROG and NO_X emissions in excess of the federal *de minimis* thresholds zero through implementation of Mitigation Measures AQ-4a and 4b. Mitigation Measures AQ-4a and 4b will ensure the requirements of the mitigation and offset program are implemented and conformity requirements for ROG and NO_X are met, should Alternative 1A be selected as the APA.

Mitigation Measure AQ-4a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4a under Impact AQ-4 in the discussion of Alternative 1A.

Mitigation Measure AQ-4b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4b under Impact AQ-4 in the discussion of Alternative 1A.

San Francisco Bay Area Air Basin

As shown in Table 22-23, implementation of the Alternative 1A would not exceed any of the SFBAAB federal *de minimis* thresholds. Accordingly, a general conformity determination is not required as total direct and indirect emissions would conform to the appropriate SFBAAB SIPs.

CEQA Conclusion: SFNA and SJVAB are classified as nonattainment or maintenance areas with regard to the ozone and PM10 NAAQS, and the impact of increases in criteria pollutant emissions above the air basin *de minimis* thresholds could conflict with or obstruct implementation of the applicable air quality plans. Since construction emissions in the SFNA and SJVAB would exceed the *de minimis* thresholds for ROG, NO_X, and PM10 (SFNA only), this impact would be significant.

Mitigation Measures AQ-4a and AQ-4b would ensure project emissions would not result in an increase in regional ROG or NO_X in the SJVAB. These measures would therefore ensure total direct and indirect ROG and NO_X emissions generated by the project would conform to the appropriate SJVAB SIPs by offsetting the action's emissions in the same or nearby area to net zero. Accordingly, impacts would be less than significant with mitigation in the SJVAB.

Although Mitigation Measures AQ-1a and AQ-1b would reduce NO_X in the SFNA, given the magnitude of NO_X emissions and the limited geographic scope available for offsets (Sacramento County), neither measure could feasibly reduce NO_X emissions to net zero for the purposes of general conformity. This impact would be significant and unavoidable in the SFNA.

Emissions generated within the SFBAAB would not exceed the SFBAAB de minimis thresholds and would therefore conform to the appropriate SFBAAB SIPs. No mitigation is required.

Impact AQ-21: Generation of Cumulative Greenhouse Gas Emissions during Construction of the Proposed Water Conveyance Facility

NEPA Effects: GHG (CO_2, CH_4, N_2O, SF_6, and HFCs) emissions resulting from construction of Alternative 1A are summarized in Table 22-24. Emissions are presented with implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*) and state mandates to reduce GHG emissions. State mandates include the RPS, LCFS, and Pavley. These mandates do not require additional action on the part of DWR, but will contribute to GHG emissions reductions. For example, Pavley and LCFS will improve the fuel efficiency of vehicles and reduce the carbon content of transportation fuels, respectively. Equipment used to construct the project will therefore be cleaner and less GHG intensive than if the state mandates had not been established.

Table 22-25 summarizes GHG emissions that would be generated in the BAAQMD, SMAQMD, SJVAPCD, and YSAQMD. The table does not include emissions from electricity generation as these emissions would be generated by power plants located throughout the state and the specific location of electricity-generating facilities is unknown (see discussion preceding this impact analysis). Due to the global nature of GHGs, the determination of effects is based on total emissions generated by construction (Table 22-24). GHG emissions presented in Table 22-25 are therefore provided for information purposes only.

Table 22-24. GHG Emissions from Construction of Alternative 1A (metric tons/year)[a]

Year	Equipment and Vehicles (CO_2e)	Electricity (CO_2e)	Concrete Batching (CO_2)	Total CO_2e
2016	0	0	577	577
2017	0	0	0	0
2018	12,534	649	71,664	84,847
2019	46,452	3,625	11,256	61,334
2020	80,608	17,414	69,945	167,967
2021	120,912	46,364	138,729	306,005
2022	144,480	65,106	210,265	419,851
2023	187,617	57,956	205,289	450,863
2024	209,256	60,453	245,610	515,320
2025	142,041	40,781	164,006	346,828
2026	109,805	14,559	39,302	163,667
2027	84,144	2,781	56,679	143,605
2028	30,837	73	11,151	42,062
2029	1,300	2	0	1,302
Total	*1,169,987*	*309,765*	*1,224,476*	*2,704,227*

[a] Emissions estimates do not account for GHG flux from land disturbance. Surface and subsurface (e.g., tunneling) activities may oxidize peat soils, releasing GHG emissions. However, recent geotechnical surveys indicated that peat is negligible below 80 feet of depth. The tunnel will be placed below this range and the design adjusted if peat soils are discovered. Peat material encountered during surface excavation for non-tunnel work will be covered with top soil to reduce oxidation when needed.

Values may not total correctly due to rounding.

Table 22-25. GHG Emissions from Construction of Alternative 1A by Air District (metric tons/year)

Year	Equipment and Vehicles (CO_2e)	Concrete Batching (CO_2)[a]	Total CO_2e[b]
SMAQMD	533,894	734,685	1,268,580
YSAQMD	61,772	0	61,772
SJVAPCD	357,359	244,895	602,254
BAAQMD	216,962	244,895	461,857

[a] Emissions assigned to each air district based on the number of batching plants located in that air district.

[b] Values may not total correctly due to rounding.

Construction of Alternative 1A would generate 2.7 million metric tons of GHG emissions after implementation of environmental commitments and state mandates (see Appendix 3B, *Environmental Commitments*). This is equivalent to adding 569,000 typical passenger vehicles to the road during construction (U.S. Environmental Protection Agency 2014e). As discussed in section 22.3.2, *Determination of Effects*, any increase in emissions above net zero associated with construction of the BDCP water conveyance features would be adverse. Accordingly, this effect would be adverse. Mitigation Measure AQ-21, which would develop a GHG Mitigation Program to reduce construction-related GHG emissions to net zero, is available address this effect. Please refer to Appendix 22A, *Air Quality Analysis Methodology*, for a summary of assumptions used to estimate potential GHG reductions associated with each strategy.

CEQA Conclusion: Construction of Alternative 1A would generate 2.7 million metric tons of GHG emissions. This is equivalent to adding 569,000 typical passenger vehicles to the road during construction (U.S. Environmental Protection Agency 2014e). As discussed in section 22.3.2, *Determination of Effects*, any increase in emissions above net zero associated with construction of the BDCP water conveyance features would be significant. Mitigation Measure AQ-21 would develop a GHG Mitigation Program to reduce construction-related GHG emissions to net zero. Accordingly, this impact would be less-than-significant with implementation of Mitigation Measure AQ-21.

Mitigation Measure AQ-21: Develop and Implement a GHG Mitigation Program to Reduce Construction Related GHG Emissions to Net Zero (0)

BDCP proponents will develop a GHG Mitigation Program prior to the commencement of any construction or other physical activities associated with CM1 that would generate GHG emissions. The GHG Mitigation Program will consist of feasible options that, taken together, will reduce construction-related GHG emissions to net zero (0) (i.e., emissions will be reduced to the maximum extent feasible and any remaining emissions from the project will be offset elsewhere by emissions reductions of equal amount). The BDCP proponents will determine the nature and form of the components of the GHG Mitigation Program after consultation with the following agencies, as applicable: (i) Study area air districts (BAAQMD, SMAQMD, SJVPACD, and YSAQMD), (ii) California Air Resources Board, (iii) U.S. Environmental Protection Agency, and (iv) California Energy Commission.

Specific strategies that could be used in formulating the GHG Mitigation Program are summarized below. The identified strategies will produce GHG reductions across a broad range of emissions sectors throughout the state. The strategies are divided into seven categories based on their application. Potential GHG emissions reductions that could be achieved by each measure are identified. It is theoretically possible that many of the strategies discussed below could independently achieve a net-zero GHG footprint for BDCP construction activities. Various combinations of measure strategies could also be pursued to optimize total costs or community co-benefits. The BDCP proponents shall be responsible for determining the overall mix of strategies necessary to ensure the performance standard to mitigate the adverse GHG construction impacts is met.

BDCP proponents will develop a mechanism for quantifying, funding, implementing, and verifying emissions reductions associated with the selected strategies. BDCP proponents will also conduct annual reporting to verify and document that selected strategies achieve sufficient emissions reductions to offset construction-related emissions to net zero. All selected strategies must be quantifiable, verifiable, enforceable, and satisfy the basic criterion of additionally (i.e., the reductions would not happen without the financial support of purchased offset credits or other mitigation strategies). Annual reports will include, at a minimum the following components.

- Calculated or measured emissions from construction activities over the reporting year.
- Projects selected for funding during the reporting year.
- Total funds distributed to selected projects during the reporting year.

- Cumulative funds distributed since program inception.
- Emissions reductions achieved during the reporting year.
- Cumulative reductions since program inception.
- Total emissions reductions remaining to satisfy the requirements of Mitigation Measure AQ-15.

GHG Emissions Reduction Strategies to Consider in Formulating a GHG Mitigation Program

This section summarizes GHG reduction strategies that will be considered in formulating a GHG mitigation program. Quantitative information on the potential capacity of each strategy is provided in Appendix 22A, *Air Quality Analysis Methods*. These estimates are based on general construction activity information, the size and trading volume of existing carbon offset markets, and available alternative energy resources (e.g., biomass, renewable energy) available to the project as potential mitigation strategies. Emissions reductions quantified for each strategy should be seen as high-level screening values that illustrate a rough order of magnitude for the expected level of emissions reductions or offsets. Moreover, the mitigation strategies should be viewed not as individual strategies, but rather as a suite of strategies. If one strategy, when investigated in greater detail prior to implementation, cannot deliver as high a level of emissions reduction or offset as initially estimated, other strategies will be implemented to ensure achievement of the performance standard of zero net GHG emissions from the project.

Renewable Energy Purchase Agreement

- **Strategy-1: Renewable Energy Purchase Agreement:** Enter into a power purchase agreement, where feasible, with utilities which provide electricity service within the Study area to purchase construction electricity from renewable sources. Renewable sources must be zero emissions energy sources (e.g., wind, solar, hydro) and may not be accounted to utility RPS goals.

Additional Onsite Mitigation

- **Strategy-2: Engine Electrification**: DWR has identified all feasible electrification requirements as environmental commitments. It is anticipated that additional technology will be available by the time construction starts that will enable further electrification. This strategy would take advantage of new technologies as they become available and will engage the maximum level of engine electrification feasible for onsite heavy-duty equipment.
- **Strategy-3: Low Carbon Concrete**: Require concrete components to be constructed out of concrete with up to 70% replacement of cement with supplementary cementitious materials (SCM) with lower embodied energy and associated GHG emissions.[25] Implementation of this strategy would require structural testing to ensure the concrete meet required strategy strength, durability, workability, and rigidity standards. If new materials with lower

[25] SCM are often incorporated in concrete mix to reduce cement contents, improve workability, increase strength, and enhance durability. Although SCM can improve the strength of resulting structures, proper testing is required ensure the cement meets technical specifications for strength and rigidity.

embodied energy or superior workability are developed between the writing of this measure and project commencement, the BDCP proponents will investigate use of those materials in place of SCM.

- **Strategy-4: Renewable Diesel and/or Bio-diesel:** Require use of renewable diesel sometimes also called "green diesel" and or bio-diesel fuels for operation of all diesel equipment. If new technologies or fuels with lower emissions rates are developed between the writing of this measure and project commencement, those advanced technologies or fuels could be incorporated into this measure.

Energy Efficiency Retrofits and Rooftop Renewable Energy

- **Strategy-5: Residential Energy Efficiency Improvements**: Develop a residential energy retrofit package in conjunction with local utility providers to achieve reductions in natural gas and electricity usage. The retrofit package should include, at a minimum, the following improvements.
    - Replacement of interior high use incandescent lamps with compact florescent lamps (CFLs) or Light Emitting Diodes (LED).
    - Installation of programmable thermostats.
    - Replacement of windows with double-pane or triple-pane solar-control low-E argon gas filled wood frame windows.
    - Identification and sealing of dust and air leaks.
    - Replacement of electric clothes dryers with natural gas dryers.
    - Replacement of natural gas furnaces with Energy Star labeled models.
    - Installation of insulation.

  This measure is inherently scalable (i.e., the total number of houses retrofit is likely limited by funds rather than the availability of housing stock).

- **Strategy-6: Commercial Energy Efficiency Improvements**: Develop a commercial energy retrocommissioning package in conjunction with local utility providers to improve building-wide energy efficiency by at least 15%, relative to current energy consumption levels. This measure is inherently scalable.

- **Strategy-7: Residential Rooftop Solar**: Develop a residential rooftop solar installation program in conjunction with local utility providers. The installation program will allow homeowners to install solar photovoltaic systems at zero or minimal up-front cost. All projects installed under this measure must be designed for high performance (e.g., optimal full-sun location, solar orientation) and additive to utility RPS goals. This measure is inherently scalable.

- **Strategy-8: Commercial Rooftop Solar**: Develop a commercial rooftop solar installation program in conjunction with local utility providers. The installation program will allow business owners to install solar photovoltaic systems at zero or minimal up-front cost. All projects installed under this measure must be designed for high performance (e.g., optimal full-sun location, solar orientation) and additive to utility RPS goals. This measure is inherently scalable.

Carbon Offsets

- **Strategy-9: Purchase Carbon Offsets**: In partnership with offset providers, purchase carbon offsets. Offset protocols and validation could tier off existing standards (e.g., Climate Registry Programs) or could be developed independently, provided such protocols satisfy basic criterion of additionally (i.e., the reductions would not happen without the financial support of purchased offset credits). ARB has established a Cap and Trade registry that identifies qualified providers and AB 32 projects. It is estimated that between 2012 and 2020, 2.5 billion allowances will be made available within the state (Legislative Analyst's Office 2012). The national and international carbon markets are likely greater. Potential offset programs could include the following.
  - AB 32 U.S. Forest and Urban Forest Project Resources
  - AB 32 Livestock Projects
  - AB 32 Ozone Depleting Substances Projects
  - AB 32 Urban Forest Projects
  - Other-California Based Offsets
  - United States Based Offsets
  - International Offsets (e.g., clean development mechanisms)

  This measure is inherently scalable based on the volume of offsets purchased.

Biomass Digestion and Conversion

- **Strategy-10: Development of Biomass Waste Digestion and Conversion Facilities**: Provide financing for facility development either through long term power purchase agreements or up front project financing. Projects will be awarded based on competitive bidding process and chosen for GHG sequestration and other environmental benefits to project area. Projects will provide a range of final products: electricity generation, Compressed Natural Gas for transportation fuels, and pipeline quality biomethane.
- **Strategy-11: Agriculture Waste Conversion Development:** Fund the re-commissioning of thermal chemical conversion facilities to process collected agricultural biomass residues**.** Project funding will include better resource modeling and provide incentives to farmers in the project area to deliver agricultural wastes to existing facilities.

Increase Renewable Energy Purchases to Operate the State Water Project

- **Strategy-12: Temporarily Increase Renewable Energy Purchases for Operations**: Temporarily increase renewable energy purchases under the Renewable Energy Procurement Plan to offset BDCP construction emissions. DWR as part of its CAP is implementing a Renewable Energy Procurement Plan. This plan identifies the quantity of additional renewable electricity resources that DWR will purchase in each year between 2010 and 2050 to achieve the GHG emissions reduction goals laid out in the CAP.

Land Use Change and Sequestration

- **Strategy-13: Tidal Wetland Inundation**: Expand the number of subsidence reversal and/or carbon sequestration projects currently being undertaken by DWR on Sherman and Twitchell Islands. Existing research at the Twitchell Wetlands Research Facility demonstrates that wetland restoration can sequester 25 tons of carbon per acre per year. Measure funding could be used to finance permanent wetlands for waterfowl or rice cultivation, creating co-benefits for wildlife and local farmers.

Impact AQ-22: Generation of Cumulative Greenhouse Gas Emissions from Operation and Maintenance of the Proposed Water Conveyance Facility and Increased Pumping

NEPA Effects: Operation of Alternative 1A would generate direct and indirect GHG emissions. Sources of direct emissions include heavy-duty equipment, on road crew trucks, and employee vehicle traffic. Indirect emissions would be generated predominantly by electricity consumption required for pumping as well as, maintenance, lighting, and other activities.

Table 22-26 summarizes long-term operational GHG emissions associated with operations, maintenance, and increased SWP pumping. Emissions were quantified for both ELT and LLT conditions, although activities would take place annually until project decommissioning. Emissions include state mandates to reduce GHG emissions (described in Impact AQ-21) (there are no BDCP specific operational environmental commitments). Total CO_2e emissions are compared to both the No Action Alternative (NEPA point of comparison) and Existing Conditions (CEQA baseline). As discussed in Section 22.3.1.2, equipment emissions are assumed to be zero under both the No Action Alternative (NEPA point of comparison) and Existing Conditions (CEQA baseline). The equipment emissions presented in Table 22-26 are therefore representative of project impacts for both the NEPA and CEQA analysis.

Table 22-26. GHG Emissions from Operation, Maintenance, and Increased SWP Pumping, Alternative 1A (metric tons/year)

Condition	Equipment CO_2e	SWP Electricity CO_2e		Total CO_2e	
		NEPA Point of Comparison	CEQA Baseline	NEPA Point of Comparison	CEQA Baseline
ELT	555	-	249,823	-	250,378
LTT	541	75,697	32,546	76,238	33,087

Note: The *NEPA point of comparison* compares total CO_2e emissions after implementation of Alternative 1A to the No Action Alternative, whereas the *CEQA baseline* compares total CO_2e emissions to Existing Conditions.

Table 22-27 summarizes equipment CO_2e emissions that would be generated in the BAAQMD, SMAQMD, and SJVAPCD (no emissions would be generated in the YSAQMD). The table does not include emissions from SWP pumping as these emissions would be generated by power plants located throughout the state (see discussion preceding this impact analysis). GHG emissions presented in Table 22-27 are therefore provided for information purposes only.

Table 22-27. Equipment CO_2e Emissions from Operation and Maintenance of Alternative 1A by Air District (metric tons/year)[a]

Air District	ELT Conditions	LLT Conditions
SMAQMD	500	485
SJVAPCD	25	26
BAAQMD	30	31
Total	555	541

[a] Emissions do not include emissions generated by increased SWP pumping.

SWP Operational and Maintenance GHG Emissions Analysis

Alternative 1A would add approximately 1,727 GWh[26] of additional net electricity demand to operation of the SWP each year assuming 2060 (LLT) conditions. Conditions at 2060 are used for this analysis because they yield the largest potential additional net electricity requirements and therefore represent the largest potential impact. This 1,727 GWh is based on assumptions of future conditions and operations and includes all additional energy required to operate the project with BDCP Alternative 1A including any additional energy associated with additional water being moved through the system.

In the CAP, DWR developed estimates of historical, current, and future GHG emissions. Figure 22-3 shows those emissions as they were projected in the CAP and how those emissions projections would change with the additional electricity demands needed to operate the SWP with the addition of BDCP Alternative 1A. As shown in Figure 22-3, in 2024, the year BDCP Alternative 1A is projected to go online, DWR total emissions jump from around 912,000 metric tons of CO_2e to nearly 1.7 million metric tons of CO_2e. This elevated level is approximately 400,000 metric tons of CO_2e above DWR's designated GHG emissions reduction trajectory (red line, which is the linear interpolation between DWR's 2020 GHG emissions goal and DWR's 2050 GHG emissions goal.) The projection indicates that after the initial jump in emissions, existing GHG emissions reduction measures would bring the elevated GHG emissions level back down below DWR's GHG emissions reduction trajectory by 2045 and that DWR would still achieve its GHG emission reduction goal by 2050.

Because employing only DWR's existing GHG emissions reduction measures would result in a large initial increase in emissions and result in DWR emissions exceeding the emissions reduction trajectory for several years, DWR will take additional actions to reduce GHG emissions if BDCP Alternative 1A is implemented.

The CAP sets forth DWR's plan to manage its activities and operations to achieve its GHG emissions reduction goals. The CAP commits DWR to monitoring its emissions each year and evaluating its emissions every five years to determine whether it is on a trajectory to achieve its GHG emissions reduction goals. If it appears that DWR will not meet the GHG emission reduction goals established in the plan, DWR may make adjustments to existing emissions reduction measures, devise new measures to ensure achievement of the goals, or take other action. Given the scale of additional

[26] Estimated net energy demand differs slightly from what is presented in Chapter 21, *Energy*. This is because the above analysis includes energy needed for transmission and distribution of water along the Valley String, which is required to enable a comparison with the assumptions in DWR's CAP.

emissions that BDCP Alternative 1A would add to DWR's total GHG emissions, DWR has evaluated the most likely method that it would use to compensate for such an increase in GHG emissions: modification of DWR's Renewable Energy Procurement Plan (REPP). The DWR REPP (GHG emissions reduction measure OP-1 in the CAP) describes the amount of additional renewable energy that DWR expects to purchase each year to meet its GHG emissions reduction goals. The REPP lays out a long-term strategy for renewable energy purchases, though actual purchases of renewable energy may not exactly follow the schedule in the REPP and will ultimately be governed by actual operations, measured emissions, and contracting.

Table 22-28 below shows how the REPP could be modified to accommodate BDCP Alternative 1A, and shows that additional renewable energy resources could be purchased during years 2022–2025 over what was programmed in the original REPP. The net result of this change is that by 2026 DWR's energy portfolio would contain nearly 1,700 GWh of renewable energy (in addition to hydropower generated at SWP facilities). This amount is nearly twice the amount called for in the original DWR REPP (1,692 compared to 792). In later years, 2031–2050, DWR would bring on slightly fewer additional renewable resources than programmed in the original REPP; however, over 13,000 additional GWh of electricity would be purchased under the modified REPP during the 40 year period 2011–2050 then under the original REPP. Figure 22-4 shows how this modified Renewable Energy Procurement Plan would affect DWR's projected future emissions with BDCP Alternative 1A.

Table 22-28. Changes in Expected Renewable Energy Purchases 2011–2050 (Alternative 1A)

	Additional GWh of Renewable Power Purchased (Above previous year)	
Year(s)	Original CAP	New CAP
2011–2020	36	36
2021	72	72
2022–2025	72	297
2026–2030	72	72
2031–2040	108	58
2041–2050	144	69
Total Cumulative	52,236	65,461

As shown in the analysis above and consistent with the analysis contained in the CAP and associated Initial Study and Negative Declaration for the CAP, BDCP Alternative 1A would not adversely affect DWR's ability to achieve the GHG emissions reduction goals set forth in the CAP. Further, Alternative 1A would not conflict with any of DWR's specific action GHG emissions reduction measures and implements all applicable project level GHG emissions reduction measures as set forth in the CAP. BDCP Alternative 1A is therefore consistent with the analysis performed in the CAP. There would be no adverse effect.

***CEQA Conclusion*:** SWP GHG emissions currently are below 1990 levels and achievement of the goals of the CAP means that total DWR GHG emissions will be reduced to 50% of 1990 levels by 2020 and to 80% of 1990 levels by 2050. The implementation of BDCP Alternative 1A would not affect DWR's established emissions reduction goals or baseline (1990) emissions and therefore would not result in a change in total DWR emissions that would be considered significant. Prior adoption of the CAP by DWR already provides a commitment on the part of DWR to make all necessary modifications to DWR's REPP (as described above) or any other GHG emission reduction measure in the CAP that are necessary to achieve DWR's GHG emissions reduction goals. Therefore no amendment to the approved CAP is necessary to ensure the occurrence of the additional GHG emissions reduction activities needed to account for BDCP-related operational emissions. The effect of BDCP Alternative 1A with respect to GHG emissions is less than cumulatively considerable and therefore less than significant. No mitigation is required.

Impact AQ-23: Generation of Cumulative Greenhouse Gas Emissions from Increased CVP Pumping as a Result of Implementation of CM1

NEPA Effects: As previously discussed, DWR's CAP cannot be used to evaluate environmental impacts associated with increased CVP pumping, as emissions associated with CVP are not under DWR's control and are not included in the CAP. Accordingly, GHG emissions resulting from increased CVP energy use are evaluated separately from GHG emissions generated as a result of SWP energy use.

Under Alternative 1A, operation of the CVP yields the generation of clean, GHG emissions-free, hydroelectric energy. This electricity is sold into the California electricity market or directly to energy users. Analysis of the No Action Alternative indicates that the CVP generates and will continue to generate all of the electricity needed to operate the CVP system and approximately 3,500 GWh of excess hydroelectric energy that would be sold to energy users throughout California. Implementation of Alternative 1A, however, would result in an increase of 167 GWh in the demand for CVP generated electricity, which would result in a reduction of 167 GWh or electricity available for sale from the CVP to electricity users. This reduction in the supply of GHG emissions-free electricity to the California electricity users could result in a potential indirect effect of the project, as these electricity users would have to acquire substitute electricity supplies that may result in GHG emissions (although additional conservation is also a possible outcome as well).

It is unknown what type of power source (e.g., renewable, natural gas) would be substituted for CVP electricity or if some of the lost power would be made up with higher efficiency. Given State mandates for renewable energy and incentives for energy efficiency, it is possible that a considerable amount of this power would be replaced by renewable resources or would cease to be needed as a result of higher efficiency. However, to ensure a conservative analysis, indirect emissions were quantified for the entire quantity of electricity (167 GWh) using the current and future statewide energy mix (adjusted to reflect RPS) (please refer to Appendix 22A, *Air Quality Analysis Methodology,* for additional detail on quantification methods).

Substitution of 167 GWh of electricity with a mix of sources similar to the current statewide mix would result in emissions of 46,714 metric tons of CO_2e; however, under expected future conditions (after full implementation of the RPS), emissions would be 36,300 metric tons of CO_2e.

Use of CVP hydroelectricity to meet increased electricity demand from operation of CVP facilities associated with Alternative 1A would reduce available CVP hydroelectricity to other California electricity users. Substitution of the lost electricity with electricity from other sources could indirectly result in an increase of GHG emissions that is comparable or larger than the level of GHG emissions that trigger mandatory GHG reporting for major facilities. As a result, these emissions could contribute to a cumulatively considerable effect and are therefore adverse. However, these emissions would be caused by dozens of independent electricity users, who had previously bought CVP power, making decisions about different ways to substitute for the lost power. These decisions are beyond the control of Reclamation or any of the other BDCP Lead Agencies. Further, monitoring to determine the actual indirect change in emissions as a result of BDCP actions would not be feasible. In light of the impossibility of predicting where any additional emissions would occur, as well as Reclamation's lack of regulatory authority over the purchasers of power in the open market, no workable mitigation is available or feasible.

CEQA Conclusion: Operation of the CVP is a federal activity beyond the control of any State agency such as DWR, and the power purchases by private entities or public utilities in the private marketplace necessitated by a reduction in available CVP-generated hydroelectric power are beyond the control of the State, just as they are beyond the control of Reclamation. For these reasons, there are no feasible mitigation measures that could reduce this potentially significant indirect impact, which is solely attributable to operations of the CVP and not the SWP, to a less than significant level. This impact is therefore determined to be significant and unavoidable.

Impact AQ-24: Generation of Regional Criteria Pollutants from Implementation of CM2–CM11

NEPA Effects: Implementation of CM2–CM11 could generate additional traffic on roads and highways in and around Suisun Marsh and the Yolo Bypass related to restoration or monitoring activities. Habitat restoration and enhancement activities that require physical changes or heavy-duty equipment would generate construction emissions through earthmoving activities and heavy-duty diesel-powered equipment. Habitat restoration and enhancement conservation measures are anticipated to include a number of activities generating traffic to transport material and workers to and from the construction sites, including the following.

- Grading, excavating, and placing fill material.
- Breaching, modifying, or removing existing levees and constructing new levees.
- Modifying, demolishing, and removing existing infrastructure (e.g., buildings, roads, fences, electric transmission and gas lines, irrigation infrastructure).
- Constructing new infrastructure (e.g., buildings, roads, fences, electric transmission and gas lines, irrigation infrastructure).

Operational emissions associated with CM2–CM11 would primarily result from vehicle trips for site inspections, monitoring, and routine maintenance. The intensity and frequency of vehicle trips associated with routine maintenance are assumed to be relatively minor. Because the specific areas and process for implementing CM2–CM11 has not been determined, this effect is evaluated qualitatively.

Table 22-29 summarizes potential construction and operational emissions that may be generated by implementation of CM2–CM11. Activities with the greatest potential to have short or long-term air quality effects are denoted with an asterisk (*).

CM2–CM11 restoration activities would occur in all air districts. Construction and operational emissions associated with the restoration and enhancement actions under Alternative 1A could potentially exceed applicable general conformity *de minimis* levels listed in Table 22-9 and applicable local thresholds listed in Table 22-8. The effect would vary according to the equipment used in construction of a specific conservation measure, the location and timing of the actions called for in the conservation measure, and the air quality conditions at the time of implementation; these effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. The effect of increases in emissions during implementation of CM2–CM11 in excess of applicable general conformity *de* *minimis* levels and air district regional thresholds (Table 22-8) could violate air basin SIPs and worsen existing air quality conditions. Mitigation Measure AQ-24 would be available to reduce this effect, but emissions would still be adverse.

CEQA Conclusion: Construction and operational emissions associated with the restoration and enhancement actions under Alternative 1A would result in a significant impact if the incremental difference, or increase, relative to Existing Conditions exceeds the applicable local air district thresholds shown in Table 22-8; these effects are expected to be further evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measure AQ-24 would be available to reduce this effect, but may not be sufficient to reduce emissions below applicable air quality management district thresholds (see Table 22-8). Consequently, this impact would be significant and unavoidable.

Mitigation Measure AQ-24: Develop an Air Quality Mitigation Plan (AQMP) to Ensure Air District Regulations and Recommended Mitigation are Incorporated into Future Conservation Measures and Associated Project Activities

BDCP proponents will develop an Air Quality Mitigation Plan (AQMP) prior to the commencement of any construction, operational, or other physical activities associated with CM2–CM11 that would involve adverse effects to air quality. The AQMP will be incorporated into the site-specific environmental review for all conservation measures or project activities. BDCP proponents will ensure that the following measures are implemented to reduce local and regional air quality impacts. Not all measures listed below may be feasible or applicable to each conservation measure. Rather, these measures serve as an overlying mitigation framework to be used for specific conservation measures. The applicability of measures listed below may also vary based on the lead agency, location, timing, available technology, and nature of each conservation measure.

- Implement basic and enhanced dust control measures recommended by local air districts in the project-area. Applicable control measures may include, but are not limited to, watering exposed surfaces, suspended project activities during high winds, and planting vegetation cover in disturbed areas.
- Require construction equipment be kept in proper working condition according to manufacturer's specifications.
- Ensure emissions from all off-road diesel-powered equipment used to construct the project do not exceed applicable air district rules and regulations (e.g., nuisance rules, opacity restrictions).
- Reduce idling time by either shutting equipment off when not in use or limiting the time of idling to less than required by the current statewide idling restriction.
- Reduce criteria pollutant exhaust emissions by requiring the latest emissions control technologies. Applicable control measures may include, but are not limited to, engine retrofits, alternative fuels, electrification, and add-on technologies (e.g., DPF).
- Undertake in good faith an effort to enter into a development mitigation contract with the local air district to offset criteria pollutant emissions below applicable air district thresholds through the payment of mitigation fees.

Implementation of this measure will reduce criteria pollutant emissions generated by construction, operational, or other physical activities associated with CM2–CM11. The applicability of measures listed above may vary based on the lead agency, location, timing, available technology, and nature of each conservation measure. If the above measures do not contribute to emissions reductions, guidelines will be developed to ensure that criteria pollutants generated during construction and project operations are reduced to the maximum extent practicable.

Table 22-29. Summary of Conservation Measures and Potential Criteria Pollutant Emissions

Habitat Restoration Activity	Potential Emissions
Grading, excavating, and placing fill material.	Criteria pollutant and GHG exhaust emissions from grading equipment (e.g., grader, bulldozer) and haul trucks). Fugitive dust from excavation activities.
Breaching, modifying, or removing existing levees and construction of new levees.*	Criteria pollutant and GHG exhaust emissions from workboats and onshore construction equipment.
Modifying, demolishing, and removing existing infrastructure (e.g., buildings, roads, fences, electric transmission and gas lines, irrigation infrastructure).*	Criteria pollutant and GHG exhaust emissions from construction equipment (e.g., backhoe, bulldozer) required to demolish existing structures. Fugitive dust during demolition. Exhaust emissions from haul trucks required to remove demolished material from the project site. Potential reduction in criteria pollutants if diesel pumps are removed.
Constructing new infrastructure (e.g., buildings, roads, fences, electric transmission and gas lines, irrigation infrastructure). Removing existing vegetation and planting/seeding of vegetation.*	Criteria pollutant and GHG exhaust emissions from construction equipment (e.g., backhoe, small bulldozer). ROG emissions from paving activities. Fugitive dust emissions from trenching for electric transmission and gas lines. Potential increase or decrease in CO_2 sequestration rates from land use change.
Controlling the establishment of nonnative vegetation to encourage the establishment of target native plant species.	Potential for criteria pollutant and GHG exhaust emissions from equipment used to modify existing habitat or remove nonnative vegetation.
Control of nonnative predator and competitor species (e.g., feral cats, rats, nonnative foxes).	Potential for criteria pollutant and GHG exhaust emissions from equipment used to modify existing habitat (e.g., install berms).
Minor grading, excavating, and filling to maintain infrastructure and habitat functions (e.g., levee maintenance; grading or placement of fill to eliminate fish stranding locations).	Criteria pollutant and GHG exhaust emissions from grading equipment (e.g., grader, bulldozer) and haul trucks. Fugitive dust from excavation activities.
Maintenance of infrastructure (e.g., buildings, roads, fences, electric transmission and gas lines, irrigation infrastructure, fences).	Criteria pollutant and GHG exhaust emissions from inspection vehicles. Potential for ROG emissions if architectural coatings are applied to existing buildings or roads are repaved.
Maintaining vegetation and vegetation structure (e.g., grazing, mowing, burning, trimming).	Criteria pollutant and GHG exhaust emissions from mowers, smoke, trimmers, and other vegetation management equipment.
Ongoing control of terrestrial and aquatic nonnative plant and wildlife species.	Potential for criteria pollutant and GHG exhaust emissions from equipment used to modify existing habitat or remove nonnative vegetation.

Note: Activities with the greatest potential to have short or long-term air quality effects are denoted with an asterisk (*).

Impact AQ-25: Exposure of Sensitive Receptors to Health Hazards from Localized Particulate Matter, Carbon Monoxide, and Diesel Particulate Matter from Implementation of CM2–CM11

Additional traffic and heavy-duty equipment required to implement CM2–CM11 would generate emissions that could expose nearby receptors to local concentrations of PM, CO, and DPM. Fugitive dust particulate matter concentrations are expected to be highest in the vicinity of restoration areas, particularly near those sites that require substantial earthmoving activities or site grading. The potential for CO hot-spots would be greatest along transportation routes used for site inspections, monitoring, and routine maintenance. DPM concentrations would likely be greatest along vehicle haul routes and adjacent to restoration sites that require substantial off-road equipment.

Sensitive receptors near restoration sites and haul routes could be exposed to increased PM, CO, and DPM concentrations. Because the extent of construction and operational activities is not known at this time, a determination of effects based on a quantitative analysis is not possible. Activities shown in Table 22-29 with the greatest potential to have short or long-term air quality impacts are also anticipated to have the greatest potential to expose receptors to substantial pollutant concentrations. The effect would vary according to the equipment used, the location and timing of the actions called for in the conservation measure, the meteorological and air quality conditions at the time of implementation, and the location of receptors relative to the emission source. Potential health effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions.

The effect of increases in PM, CO, or DPM (cancer and non-cancer-risk) in excess of applicable air district thresholds (Table 22-8) at receptor locations could result in adverse health impacts. Mitigation Measures AQ-24 and AQ-25 would be available to reduce this effect.

***CEQA Conclusion*:** Construction and operational emissions associated with the restoration and enhancement actions under Alternative 1A would result in a significant impact if PM, CO, or DPM (cancer and non-cancer-risk) concentrations at receptor locations exceed the applicable local air district thresholds shown in Table 22-8; these effects are expected to be further evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measures AQ-24 and AQ-25 would ensure localized concentrations at receptor locations would be below applicable air quality management district thresholds (see Table 22-8). Consequently, this impact would be less than significant.

Mitigation Measure AQ-24: Develop an Air Quality Mitigation Plan (AQMP) to Ensure Air District Regulations and Recommended Mitigation are Incorporated into Future Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-24 under Impact AQ-24 in the discussion of Alternative 1A.

Mitigation Measure AQ-25: Prepare a Project-Level Health Risk Assessment to Reduce Potential Health Risks from Exposure to Localized DPM and PM Concentrations

The site-specific environmental review for all conservation measures will perform a detailed health risk assessment (HRA) if sensitive receptors are located within 0.50 mile of project activities. The half-mile buffer represents the furthest distance at which Plan Area air districts recommend performing a HRA as pollutant concentrations dissipate as a function of distance from the emissions source. The site-specific HRA will evaluate potential health risks to nearby sensitive receptors from exposure to DPM and PM (as recommended by the local air district's CEQA Guidelines) and ensure that impacts are below applicable air district health risk thresholds. If the HRA identifies health risks in excess of applicable air district health risk thresholds, additional mitigation and/or site design changes will be incorporated into the site-specific environmental review to ensure health risks are reduced below applicable air district health risk thresholds. Examples of potential additional mitigation include, but are not limited to, use aftermarket equipment controls (e.g., diesel particulate filters), alternative fuels, and advanced engine technologies (e.g., Tier 4 engines), as well as construction of vegetative buffers and receptor relocation.

Impact AQ-26: Creation of Potential Odors Affecting a Substantial Number of People from Implementation of CM2–CM11

Implementation of CM2–CM11 will convert land types to increase available habitat for BDCP covered species (e.g., cultivated land converted to tidal natural communities). Diesel emissions from earthmoving equipment could generate temporary odors, but these would quickly dissipate and cease once construction is completed. Accordingly, construction activities associated with CM2–CM11 are not anticipated to result in nuisance odors.

Among the land use types affected by the program, the conservation measures would restore estuarine wetland and upland habitats, both of which can generate odors from natural processes. Odors from wetlands are typically caused from organic decomposition that releases hydrogen sulfide gas. Similar reactions take place in tidal mudflats due to anaerobic decomposition caused by bacteria (National Oceanic and Atmospheric Administration 2008). While restored land uses associated with the program have the potential to generate odors from natural processes, the emissions would be similar in origin and magnitude to the existing land use types in the restored area (e.g., managed wetlands). Moreover, specific odor effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Accordingly, odor-related effects associated with CM2–CM11 would not be adverse.

***CEQA Conclusion*:** Alternative 1A would not result in the addition of major odor producing facilities. Diesel emissions during construction could generate temporary odors, but these would quickly dissipate and cease once construction is completed. Increases in wetland, tidal, and upland habitats may increase the potential for odors from natural processes. However, the origin and magnitude of odors would be similar to the existing land use types in the restored area (e.g., managed wetlands). Moreover, specific odor impacts would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Accordingly, the impact of exposure of sensitive receptors to potential odors would be less than significant. No mitigation is required.

Impact AQ-27: Generation of Cumulative Greenhouse Gas Emissions from Implementation of CM2–CM11

NEPA Effects: CM2–CM11 implemented under Alternative 1A would result in local GHG emissions from construction equipment and vehicle exhaust. Restoration activities with the greatest potential for emissions include those that break ground and require use of earthmoving equipment. The type of restoration action and related construction equipment use are shown in Table 22-29. Implementing CM2–CM11 would also affect long-term sequestration rates through land use changes, such as conversion of agricultural land to wetlands, inundation of peat soils, drainage of peat soils, and removal or planting of carbon-sequestering plants.

- Restoration activities associated with Alternative 1A would create the following land types.
- Up to 65,000 acres of tidal wetland habitat
- Up to 5,000 acres of riparian habitat

- Up to 10,000 acres of seasonally inundated floodplain
- Up to 2,000 acres of grassland
- Up to 1,200 acres of nontidal marsh

An initial analysis of land cover/use changes associated with tidal and riparian habitat restoration indicates that these program elements could have a beneficial impact on GHG emissions in the California Delta. However, as discussed above, carbon flux from land use change is dynamic and extremely variable. For example, the carbon sequestration potential of saline marshes ranges from 54 to 385 grams of CO_2 per square meter per year (Trulio 2007). Wetlands also sequester carbon dioxide, but at a much slower rate. While these land uses can sequester CO_2, they also produce CH_4. Since CH_4 is a far more potent GHG, when compared to CO_2, CH_4 production may overwhelm the benefits obtained from carbon sequestration (U.S. Climate Change Science Program 2007).

Without additional information on site-specific characteristics associated with each of the restoration components, a complete assessment of GHG flux from CM2–CM11 is currently not possible. The effect of carbon sequestration and CH_4 generation would vary by land use type, season, and chemical and biological characteristics; these effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measures AQ-24 and AQ-27 would be available to reduce this effect. However, due to the potential for increases in GHG emissions from construction and land use change, this effect would be adverse.

***CEQA Conclusion*:** The restoration and enhancement actions under Alternative 1A could result in a significant impact if activities are inconsistent with applicable GHG reduction plans, do not contribute to a lower carbon future, or generate excessive emissions, relative to other projects throughout the state. These effects are expected to be further evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measures AQ-24 and AQ-27 would be available to reduce this impact, but may not be sufficient to reduce to a less-than-significant level. Consequently, this impact would be significant and unavoidable.

Mitigation Measure AQ-24: Develop an Air Quality Mitigation Plan (AQMP) to Ensure Air District Regulations and Recommended Mitigation are Incorporated into Future Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-24 under Impact AQ-24 in the discussion of Alternative 1A.

Mitigation Measure AQ-27: Prepare a Land Use Sequestration Analysis to Quantify and Mitigate (as Needed) GHG Flux Associated with Conservation Measures and Associated Project Activities

BDCP proponents will prepare a land use sequestration analysis to evaluate GHG flux associated with implementation of CM2–CM11. The land use analysis will evaluate the one-time carbon storage loss associated with vegetation removal, soil carbon content, and existing and future with project GHG flux. In the event that the land use analysis demonstrates a net positive GHG flux, feasible strategies to reduce GHG emissions will be undertaken. To the extent feasible, mitigation shall require project design changes so that land uses that serve as carbon sinks (i.e., result in net decreases in carbon) are not replaced with other uses that are sources (i.e., result in net increases in carbon) of GHG emissions.

22.3.3.3 Alternative 1B—Dual Conveyance with East Alignment and Intakes 1–5 (15,000 cfs; Operational Scenario A)

As with Alternative 1A, a total of five intakes would be constructed (assumed to be Intakes 1–5). Under Alternative 1B, no intermediate forebay would be constructed. The conveyance facility would be a canal on the east side of the Sacramento River (Figures 3-4 and 3-5 in Chapter 3, *Description of Alternatives*).

Construction and operation of Alternative 1B would require the use of electricity, which would be supplied by the California electrical grid. Power plants located throughout the state supply the grid with power, which will be distributed to the Study area to meet project demand. Power supplied by statewide power plants will generate criteria pollutants. Because these power plants are located throughout the state, criteria pollutant emissions associated with Alternative 1B electricity demand cannot be ascribed to a specific air basin or air district within the Study area. Criteria pollutant emissions from electricity consumption, which are summarized in Table 22-30, are therefore provided for informational purposes only and are not included in the impact conclusion.

Table 22-30. Criteria Pollutant Emissions from Electricity Consumption: Construction and Net Project Operations, Alternative 1B (tons/year) [a, b]

Year	Analysis	ROG	CO	NO_X	PM10	PM2.5[c]	SO_2
2016	-	0	0	0	0	0	0
2017	-	0	0	0	0	0	0
2018	-	<1	<1	<1	<1	<1	<1
2019	-	<1	1	<1	<1	<1	<1
2020	-	<1	4	<1	<1	<1	2
2021	-	<1	10	1	1	1	4
2022	-	<1	13	1	1	1	6
2023	-	<1	12	1	1	1	5
2024	-	<1	12	1	1	1	5
2025	-	<1	8	1	1	1	4
2026	-	<1	3	<1	<1	<1	1
2027	-	<1	1	<1	<1	<1	<1
2028	-	<1	<1	<1	<1	<1	<1
2029	-	<1	<1	<1	<1	<1	<1
ELT	CEQA	2	15	211	18	18	89
LLT	NEPA	2	19	267	23	23	113
LLT	CEQA	1	7	101	9	9	43

NEPA = Compares criteria pollutant emissions after implementation of Alternative 1B to the No Action Alternative.

CEQA = Compares criteria pollutant emissions after implementation of Alternative 1B to Existing Conditions.

[a] Emissions assume implementation of RPS (see Appendix 22A, *Air Quality Analysis Methodology*). Power plants that generate electricity for the proposed project would be subject to local air district permitting requirements, including standards to implement BACT to reduce criteria pollutant emissions.

[b] Because GHG emissions are cumulative (see Section 22.3.2.1) and not evaluated at the local air basin or air district level, they are discussed in Impacts AQ-21 and AQ-22. The GHG analysis for SWP power utilizes actual and forecasted GHG emissions rates for the SWP system, which differs slightly from the above analysis. Statewide grid average emission factors were utilized for the above analysis as criteria pollutant emission factors for SWP were unavailable. Please also note that the above analysis does not account for additional renewable energy that will be procured through modifications to DWR's REPP (see Impact AQ-22). Accordingly, the emissions results presented above represent a conservative assessment of potential criteria pollutant emissions.

[c] Emission factors for PM2.5 are currently unavailable. Consequently, PM2.5 emissions were assumed to equal PM10 emissions. Because PM2.5 represents a fraction of PM10, this approach represents a conservative assessment of PM2.5 emissions from electricity consumption.

Construction activities would generate emissions of ozone precursors (ROG and NO_X), CO, PM10, PM2.5, and SO_2. Table 22-31 summarizes criteria pollutant emissions that would be generated in the BAAQMD, SMAQMD, SJVAPCD, and YSAQMD in pounds per day and tons per year. Emissions estimates include implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*). Although emissions are presented in different units (pounds and tons), the amounts of emissions are identical (i.e., 2,000 pounds is identical to 1 ton). Summarizing emissions in both pounds per day and tons per year is necessary to evaluate project-level effects against the appropriate air district thresholds, which are given in both pounds and tons (see Table 22-8).

As shown in Appendix 22B, *Air Quality Assumptions*, construction activities during several phases will likely occur concurrently. To ensure a conservative analysis, the maximum daily emissions during these periods of overlap were estimated assuming all equipment would operate at the same time—this gives the maximum total project-related air quality impact during construction. Accordingly, the daily emissions estimates represent a conservative assessment of construction impacts. Exceedances of the air district thresholds are shown in underlined text.

Table 22-31. Criteria Pollutant Emissions from Construction of Alternative 1B (pounds/day and tons/year)

	Maximum Daily Emissions (pounds/day)										Annual Emissions (tons/year)									
	Bay Area Air Quality Management District										Bay Area Air Quality Management District									
				PM10			PM2.5							PM10			PM2.5			
Year	ROG	NO_X	CO	Exhaust	Dust	Total	Exhaust	Dust	Total	SO_2	ROG	NO_X	CO	Exhaust	Dust	Total	Exhaust	Dust	Total	SO_2
2016	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2017	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2018	11	219	64	1	155	155	1	40	40	3	<1	3	1	<1	2	2	<1	1	1	<1
2019	15	282	86	1	194	195	1	50	51	3	1	10	4	<1	5	5	<1	1	1	<1
2020	11	151	64	1	82	83	1	21	22	1	1	11	6	<1	5	5	<1	1	1	<1
2021	15	226	87	1	134	135	1	34	35	2	1	13	7	<1	6	6	<1	1	1	<1
2022	30	518	180	2	348	350	2	89	91	6	1	12	6	<1	6	6	<1	2	2	<1
2023	88	901	512	6	470	476	6	109	113	9	4	37	25	<1	19	20	<1	4	4	<1
2024	94	932	548	7	486	493	7	108	115	9	8	64	48	1	24	25	1	5	5	1
2025	73	662	411	5	309	314	5	68	72	6	5	36	28	<1	14	14	<1	3	3	<1
2026	47	446	291	4	233	237	4	51	55	5	4	32	25	<1	13	14	<1	3	3	<1
2027	50	456	295	7	240	246	7	53	59	5	3	22	17	<1	12	12	<1	2	3	<1
2028	16	231	101	1	200	201	1	45	46	3	<1	2	1	<1	2	2	<1	<1	1	<1
2029	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Thresholds	*54*	*54*	-	*82*	*BMPs*	-	*54*	*BMPs*	-	-	-	-	-	-	-	-	-	-	-	-
	Sacramento Metropolitan Air Quality Management District										Sacramento Metropolitan Air Quality Management District									
				PM10			PM2.5							PM10			PM2.5			
Year	ROG	NO_X	CO	Exhaust	Dust	Total	Exhaust	Dust	Total	SO_2	ROG	NO_X	CO	Exhaust	Dust	Total	Exhaust	Dust	Total	SO_2
2016	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2017	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2018	173	1,294	1,313	20	594	614	20	92	112	6	8	54	56	1	27	28	1	4	5	<1
2019	241	1,824	1,695	29	714	740	28	112	138	8	18	134	126	2	50	52	2	8	10	1
2020	120	1,109	733	19	289	308	18	51	68	4	13	109	77	2	28	30	2	5	7	<1
2021	161	1,468	928	21	488	509	20	83	103	5	15	121	84	2	42	44	2	6	8	<1
2022	222	2,166	1,419	27	756	775	25	122	143	12	15	122	94	2	62	64	2	8	10	1
2023	383	3,303	2,471	41	1,101	1,136	39	173	208	29	31	239	209	3	92	95	3	12	15	1
2024	411	3,609	2,682	44	1,278	1,321	42	196	237	27	37	278	241	4	117	121	3	16	19	2
2025	364	3,652	2,527	39	1,459	1,498	38	207	244	25	19	141	131	2	72	74	2	10	12	1
2026	212	1,534	1,217	17	624	640	16	107	123	17	17	109	111	2	62	64	2	9	11	1
2027	225	1,817	1,423	21	670	692	21	112	132	26	18	129	117	2	73	75	2	10	12	1
2028	142	1,068	758	9	502	510	9	84	92	5	7	46	37	<1	26	26	<1	4	4	<1
2029	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Thresholds	-	*85*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Year	San Joaquin Valley Air Pollution Control District										San Joaquin Valley Air Pollution Control District									
	ROG	NO_X	CO	PM10			PM2.5			SO_2	ROG	NO_X	CO	PM10			PM2.5			SO_2
				Exhaust	Dust	Total	Exhaust	Dust	Total					Exhaust	Dust	Total	Exhaust	Dust	Total	
2016	0	0	0	0	29	29	0	4	4	0	0	0	0	0	2	2	0	<1	<1	0
2017	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2018	414	2,657	3,209	45	1,288	1,333	44	186	230	12	13	74	107	2	49	51	2	7	8	<1
2019	599	4,102	4,258	69	1,617	1,679	66	238	299	17	46	327	313	6	112	118	5	17	23	1
2020	244	2,128	1,456	39	434	473	37	72	109	6	30	256	174	5	49	54	5	8	13	1
2021	263	2,183	1,489	40	454	494	38	75	113	6	33	273	186	5	54	59	5	9	14	1
2022	276	2,198	1,512	41	466	507	39	76	115	6	22	166	119	3	38	42	3	6	9	<1
2023	167	1,181	1,107	16	424	432	15	61	68	4	13	86	88	1	32	33	1	5	6	<1
2024	179	1,313	1,156	13	360	373	12	52	64	5	11	73	74	1	26	27	1	4	5	<1
2025	7	41	49	<1	63	63	<1	10	10	<1	1	5	5	<1	8	8	<1	1	1	<1
2026	5	29	32	<1	33	33	<1	5	5	<1	<1	2	2	<1	3	3	<1	<1	<1	<1
2027	3	6	14	8	31	39	8	5	13	<1	<1	<1	1	<1	3	3	<1	<1	1	<1
2028	0	0	0	0	29	29	0	4	4	0	0	0	0	0	2	2	0	<1	<1	0
2029	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Thresholds	-	-	-	-	-	-	-	-	-	-	*10*	*10*	-	-	-	*15*	-	-	*15*	-

Year	Yolo Solano Air Quality Management District										Yolo Solano Air Quality Management District									
	ROG	NO_X	CO	PM10			PM2.5			SO_2	ROG	NO_X	CO	PM10			PM2.5			SO_2
				Exhaust	Dust	Total	Exhaust	Dust	Total					Exhaust	Dust	Total	Exhaust	Dust	Total	
2016	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2017	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2018	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2019	1	15	3	<1	4	4	<1	1	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
2020	1	15	3	<1	4	4	<1	1	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
2021	8	200	44	1	56	56	1	14	15	1	<1	2	<1	<1	1	1	<1	<1	<1	<1
2022	15	382	86	1	110	111	1	28	29	2	1	16	4	<1	5	5	<1	1	1	<1
2023	20	447	120	1	161	162	1	41	43	3	1	14	4	<1	5	5	<1	1	1	<1
2024	20	437	119	1	161	162	1	41	43	3	1	14	4	<1	5	5	<1	1	1	<1
2025	20	419	117	1	158	159	1	41	42	3	<1	9	3	<1	3	4	<1	1	1	<1
2026	13	268	77	1	104	105	1	27	28	2	<1	8	2	<1	3	3	<1	1	1	<1
2027	13	260	76	1	104	105	1	27	28	2	<1	10	3	<1	4	4	<1	1	1	<1
2028	13	252	75	1	102	103	1	26	27	2	<1	9	3	<1	4	4	<1	1	1	<1
2029	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Thresholds	-	-	-	-	-	*80*	-	-	-	-	*10*	*10*	-	-	-	-	-	-	-	-

Operation and maintenance activities under Alternative 1B would result in emissions of ROG, NO_X, CO, PM10, PM2.5, and SO_2. Emissions were quantified for both ELT and LT conditions, although activities would take place annually until project decommissioning. Future emissions, in general, are anticipated to lessen because of continuing improvements in vehicle and equipment engine technology.

Table 22-32 summarizes criteria pollutant emissions associated with operation of Alternative 1B in the BAAQMD, SMAQMD, and SJVAPCD in pounds per day and tons per year (no operational emissions would be generated in the YSAQMD). Although emissions are presented in different units (pounds and tons), the amounts of emissions are identical (i.e., 2,000 pounds is identical to 1 ton). Summarizing emissions in both pounds per day and tons per year is necessary to evaluate project-level effects against the appropriate air district thresholds, which are given in both pounds and tons (see Table 22-8).

Table 22-32. Criteria Pollutant Emissions from Operation of Alternative 1B (pounds per day and tons per year)

	Maximum Daily Emissions (pounds/day)						Annual Emissions (tons/year)					
	Bay Area Air Quality Management District						Bay Area Air Quality Management District					
Condition	ROG	NO_X	CO	PM10	PM2.5	SO_2	ROG	NO_X	CO	PM10	PM2.5	SO_2
ELT	1	5	10	3	1	<1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
LLT	1	4	10	3	1	<1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Thresholds	*54*	*54*	-	*82*	*82*	-	-	-	-	-	-	
	Sacramento Metropolitan Air Quality Management District						Sacramento Metropolitan Air Quality Management District					
Condition	ROG	NO_X	CO	PM10	PM2.5	SO_2	ROG	NO_X	CO	PM10	PM2.5	SO_2
ELT	2	14	29	6	2	<1	0.18	1.07	2.30	0.36	0.11	0.01
LLT	2	11	27	6	1	<1	0.15	0.90	2.20	0.35	0.09	<0.01
Thresholds	*65*	*65*	-	-	-	-	-	-	-	-	-	-
	San Joaquin Valley Air Pollution Control District						San Joaquin Valley Air Pollution Control District					
Condition	ROG	NO_X	CO	PM10	PM2.5	SO_2	ROG	NO_X	CO	PM10	PM2.5	SO_2
ELT	1	6	12	3	1	<1	<0.01	0.01	0.01	<0.01	<0.01	<0.01
LLT	1	4	11	3	1	<1	<0.01	<0.01	0.01	<0.01	<0.01	<0.01
Thresholds	-	-	-	-	-	-	*10*	*10*	-	*15*	*15*	-

Impact AQ-1: Generation of Criteria Pollutants in Excess of the SMAQMD Regional Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: As shown in Table 22-30, construction emissions would exceed SMAQMD's daily NO_X threshold for all years between 2018 and 2028, even with implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*). All other pollutants would be below air district thresholds and therefore would not result in an adverse regional air quality effect. Since NO_X is a precursor to ozone and PM, exceedances of SMAQMD's daily NO_X threshold could impact both regional ozone and PM formation, which could worsen regional air quality and air basin attainment of the NAAQS and CAAQS.

While equipment could operate at any work area identified for this alternative, the highest level of NO_X emissions in the SMAQMD is expected to occur at those sites where the duration and intensity of construction activities would be greatest. This includes all intake and intake pumping plant sites along the east bank of the Sacramento River, as well as the canal, a siphon, and a tunnel segment under the Mokelumne River.

Environmental commitments outlined in Appendix 3B, *Environmental Commitments,* will reduce construction-related emissions; however, as shown in Table 22-30, NO_X emissions would still exceed SMAQMD's identified in Table 22-8 and result in an adverse effect to air quality. Mitigation Measures AQ-1a and AQ-1b would be available to reduce NO_X emissions, and would thus address regional effects related to secondary ozone and PM formation.

***CEQA Conclusion*:** NO_X emissions generated during construction would exceed SMAQMD threshold identified in Table 22-8. Since NO_X is a precursor to ozone and PM, exceedances of SMAQMD's daily NO_X threshold could impact both regional ozone and PM formation. SMAQMD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS or NAAQS. The impact of generating NO_X emissions in excess of local air district thresholds would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. This impact would therefore be significant. Mitigation Measures AQ-1a and AQ-1b would be available to reduce NO_X emissions to a less-than-significant level by offsetting emissions to quantities below SMAQMD CEQA thresholds (see Table 22-8).

Mitigation Measure AQ-1a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-1a under Impact AQ-1 in the discussion of Alternative 1A.

Mitigation Measure AQ-1b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-1b under Impact AQ-1 in the discussion of Alternative 1A.

Impact AQ-2: Generation of Criteria Pollutants in Excess of the YSAQMD Regional Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: As shown in Table 22-30, construction emissions would exceed YSAQMD regional thresholds for the following pollutants and years, even with implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*). All other pollutants would be below air district thresholds and therefore would not result in an adverse air quality effect.

- NO_X: 2022–2024 and 2027
- PM10: 2022–2028

Since NO_X is a precursor to ozone and NO_X is a precursor to PM, exceedances of YSAQMD's NO_X threshold could impact both regional ozone and PM formation, which could worsen regional air quality and air basin attainment of the NAAQS and CAAQS. Similarly, exceedances of YSAQMD's PM10 threshold could impede attainment of the NAAQS and CAAQS for PM10. All emissions generated within YSAQMD are a result of haul truck movement for equipment and material delivery.

Environmental commitments outlined in Appendix 3B, *Environmental Commitments,* will reduce construction-related emissions; however, as shown in Table 22-31, NO_X and PM10 emissions would still exceed the applicable YSAQMD thresholds identified in Table 22-8 and result in an adverse regional effect to air quality. Mitigation Measures AQ-1a and AQ-1b are available to reduce NO_X and PM10 emissions, and would thus address regional effects related to secondary ozone and PM formation.

***CEQA Conclusion*:** Emissions of NO_X and PM10 generated during construction would exceed YSAQMD's regional thresholds identified in Table 22-8. Since NO_X is a precursor to ozone and NO_X is a precursor to PM, exceedances of YSAQMD's NO_X threshold could impact both regional ozone and PM formation, which could worsen regional air quality and air basin attainment of the NAAQS and CAAQS. Similarly, exceedances of YSAQMD's PM10 threshold could impede attainment of the NAAQS and CAAQS for PM10. YSAQMD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS or NAAQS. The impact of generating NO_X and PM10 in excess of local air district regional thresholds would therefore violate applicable air quality standards in the study area and could contribute to or worsen an existing air quality conditions. This would be a significant impact. Mitigation Measures AQ-1a and AQ-1b would be available to reduce NO_X and PM10 emissions to a less-than-significant level by offsetting emissions to quantities below YSAQMD CEQA thresholds (see Table 22-8).

Mitigation Measure AQ-1a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-1a under Impact AQ-1 in the discussion of Alternative 1A.

Mitigation Measure AQ-1b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SMAQMD/SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SMAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-1b under Impact AQ-1 in the discussion of Alternative 1A.

Impact AQ-3: Generation of Criteria Pollutants in Excess of the BAAQMD Regional Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: As shown in Table 22-30, construction emissions would exceed BAAQMD's daily thresholds for the following pollutants and years, even with implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*). All other pollutants would be below air district thresholds and therefore would not result in an adverse air quality effect.

- ROG: 2023–2025
- NO_X: 2018–2028

Since ROG and NO_X are precursors to ozone and NO_X is a precursor to PM, exceedances of BAAQMD's ROG and NO_X thresholds could impact both regional ozone and PM formation, which could worsen regional air quality and air basin attainment of the NAAQS and CAAQS.

While equipment could operate at any work area identified for this alternative, the highest level of ROG and NO_X emissions in the BAAQMD is expected to occur at those sites where the duration and intensity of construction activities would be greatest, including the site of the Byron Tract Forebay adjacent to and south of Clifton Court Forebay.

Environmental commitments outlined in Appendix 3B, *Environmental Commitments,* will reduce construction-related emissions; however, as shown in Table 22-30, ROG and NO_X emissions would still exceed BAAQMD's thresholds identified in Table 22-8 and result in a regional adverse effect to air quality. Mitigation Measures AQ-3a and AQ-3b are available to reduce ROG and NO_X emissions, and would thus address regional effects related to secondary ozone and PM formation.

CEQA Conclusion**:** Emissions of ROG and NO_X precursors generated during construction would exceed BAAQMD thresholds identified in Table 22-8. Since ROG and NO_X are precursors to ozone and NO_X is a precursor to PM, exceedances of BAAQMD's ROG and NO_X thresholds could impact both regional ozone and PM formation. BAAQMD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS or NAAQS. The impact of generating ROG and NO_X emissions in excess of local air district regional thresholds would therefore violate applicable air quality standards in the Plan Area and could contribute to or worsen an existing air quality conditions. This would be a significant impact. Mitigation Measures AQ-3a and AQ-3b would be available to reduce NO_X emissions to a less-than-significant level.

Mitigation Measure AQ-3a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within BAAQMD/SFBAAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable BAAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-3a under Impact AQ-3 in the discussion of Alternative 1A.

Mitigation Measure AQ-3b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the BAAQMD/SFBAAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable BAAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-3b under Impact AQ-3 in the discussion of Alternative 1A.

Impact AQ-4: Generation of Criteria Pollutants in Excess of the SJVAPCD Regional Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: As shown in Table 22-30, construction emissions would exceed SJVAPCD's annual thresholds for the following years and pollutants, even with implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*). All other pollutants would be below air district thresholds and therefore would not result in an adverse air quality effect.

- ROG: 2019–2022
- NO_X: 2018–2024

- PM10: 2018–2024
- PM2.5: 2019

Since ROG and NO_X are precursors to ozone and NO_X is a precursor to PM, exceedances of SJVAPCD's ROG and NO_X thresholds could impact both regional ozone and PM formation, which could worsen regional air quality and air basin attainment of the NAAQS and CAAQS. Similarly, exceedances of SJVAPCD's PM10 and PM2.5 thresholds could impede attainment of the NAAQS and CAAQS for PM.

While equipment could operate at any work area identified for this alternative, the highest level of ROG, NO_X, PM10, and PM2.5 emissions in the SJVAPCD are expected to occur at those sites where the duration and intensity of construction activities would be greatest. This includes all temporary and permanent utility sites, as well as all construction sites along the east conveyance alignment. PM10 emissions are expected to be greatest within the immediate vicinity of the concrete batching plants. For a map of the proposed east alignment, see Mapbook Figure M3-2.

Environmental commitments outlined in Appendix 3B, *Environmental Commitments,* will reduce construction-related emissions; however, as shown in Table 22-31, ROG, NO_X, PM10, and PM2.5 emissions would still exceed SJVAPCD's thresholds identified in Table 22-8 and result in a regional adverse effect to air quality. Mitigation Measures AQ-4a and AQ-4b are available to reduce ROG, NO_X, PM10, and PM2.5 emissions, and would thus address regional effects related to secondary ozone and PM formation.

CEQA Conclusion**:** Emissions of ROG, NO_X, PM10, and PM2.5 generated during construction would exceed SJVAPCD's regional significance thresholds identified in Table 22-8. Since ROG and NO_X are precursors to ozone and NO_X is a precursor to PM, exceedances of SJVAPCD's ROG and NO_X thresholds could impact both regional ozone and PM formation, which could worsen regional air quality and air basin attainment of the NAAQS and CAAQS. Similarly, exceedances of SJVAPCD's PM10 and PM2.5 thresholds could impede attainment of the NAAQS and CAAQS for PM10. SJVAPCD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS or NAAQS for ozone and PM. The impact of generating ROG, NO_X, PM10, and PM2.5 in excess of local air district thresholds would therefore violate applicable air quality standards in the Plan Area and could contribute to or worsen an existing air quality conditions. This would be a significant impact. Mitigation Measures AQ-4a and AQ-4b would be available to reduce emissions to a less-than-significant level by offsetting emissions to quantities below SJVAPCD CEQA threshold (see Table 22-8).

Mitigation Measure AQ-4a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4a under Impact AQ-4 in the discussion of Alternative 1A.

Mitigation Measure AQ-4b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4b under Impact AQ-4 in the discussion of Alternative 1A.

Impact AQ-5: Generation of Criteria Pollutants in Excess of the SMAQMD Regional Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance in SMAQMD could include both routine activities and yearly maintenance. Daily activities at all pumping plants and intakes are covered by maintenance, management, repair, and operating crews. Yearly maintenance would include annual inspections and sediment removal (see Appendix 22A, *Air Quality Analysis Methodology,* for additional detail). The highest concentration of operational emissions in the SMAQMD is expected at intake and intake pumping plant sites along the east bank of the Sacramento River. As shown in Table 22-32, operation and maintenance activities under Alternative 1B would not exceed SMAQMD's regional thresholds of significance and there would be no adverse effect (see Table 22-8). Accordingly, project operations would not contribute to or worsen existing air quality exceedances. There would be no adverse effect.

***CEQA Conclusion*:** Emissions generated during operation and maintenance activities would not exceed SMAQMD regional thresholds for criteria pollutants. SMAQMD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Because project operations would not exceed SMAQMD regional thresholds, the impact would be less than significant. No mitigation is required.

Impact AQ-6: Generation of Criteria Pollutants in Excess of the YSAQMD Regional Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Alternative 1B would not construct any permanent features in the YSAQMD that would require routine operations and maintenance. No operational emissions would be generated in the YSAQMD. Consequently, operation of Alternative 1B would neither exceed the YSAQMD thresholds of significance nor result in an adverse effect on air quality.

***CEQA Conclusion*:** No operational or maintenance emissions generated by the alternative would occur in YSAQMD. Accordingly, Alternative 1B would not contribute to or worsen existing air quality conditions. This impact would be less than significant. No mitigation is required.

Impact AQ-7: Generation of Criteria Pollutants in Excess of the BAAQMD Regional Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance in BAAQMD could include annual inspections and sediment removal (see Appendix 22A, *Air Quality Analysis Methodology,* for additional detail). The highest concentration of operational emissions in the BAAQMD are expected at the Byron Tract Forebay (including control gates), which is adjacent to and south of Clifton Court Forebay. As shown in Table 22-32, operation and maintenance activities under Alternative 1B would not exceed BAAQMD's regional thresholds of significance (see Table 22-8). Thus, project operations would not contribute to or worsen existing air quality exceedances. There would be no adverse effect.

***CEQA Conclusion*:** Emissions generated during operation and maintenance activities would not exceed BAAQMD regional thresholds for criteria pollutants. The BAAQMD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district thresholds would violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Because project operations would not exceed BAAQMD regional thresholds, the impact would be less than significant. No mitigation is required.

Impact AQ-8: Generation of Criteria Pollutants in Excess of the SJVAPCD Regional Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance in SJVAPCD could include annual inspections (see Appendix 22A, *Air Quality Analysis Methodology,* for additional detail). The highest concentrationof operational emissions in the SJVPACD is expected at routine inspection sites along the east canal alignment. For a map of the proposed east alignment, see Mapbook Figure M3-2. As shown in Table 22-32, operation and maintenance activities under Alternative 1B would not exceed SJVAPCD's regional thresholds of significance (see Table 22-8). Accordingly, project operations would not contribute to or worsen existing air quality exceedances. There would be no adverse effect.

CEQA Conclusion**:** Emissions generated during operation and maintenance activities would not exceed SJVAPCD's regional thresholds of significance. The SJVAPCD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district thresholds would violate applicable air quality standards in the Plan Area and could contribute to or worsen an existing air quality conditions. Because project operations would not exceed SJVAPCD regional thresholds, the impact would be less than significant. No mitigation is required.

Impact AQ-9: Exposure of Sensitive Receptors to Health Hazards from Localized Particulate Matter in Excess of SMAQMD's Health-Based Concentration Thresholds

NEPA Effects: As shown in Table 22-31, construction would increase PM10 and PM2.5 emissions in SMAQMD, which may pose inhalation-related health risks for receptors exposed to certain concentrations.

PM2.5 and PM10 concentrations at sensitive receptors locations were assessed using the EPA's AERMOD dispersion. The methodology described in Section 22.3.1.3 provides a more detailed summary of the approach used to conduct the analysis. Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, provides an in-depth discussion of the methodology and results.

As shown in Table 22-33, all estimated annual PM10 and PM2.5 concentrations would be less than SMAQMD's annual thresholds. However, the maximum predicted 24-hour PM10 concentration exceeds SMAQMD's threshold of 2.5 $\mu g/m^3$. Exceedances of the threshold would occur at 186 receptor locations near intakes and intake work areas. The exceedances would be temporary and occur intermittently due to soil disturbance.

Table 22-33. Alternative 1B PM10 and PM2.5 Concentration Results in SMAQMD

	PM10		PM2.5	
Parameter	Annual (μg/m³)	24-Hour (μg/m³)	Annual (μg/m³)	24-Hour (μg/m³)
Maximum Value	0.5	21.1	0.1	3.5
SMAQMD Threshold	*1*	*2.5*	*0.6*	-

Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions,* includes modeling results for all receptors.
μg/m³ = micrograms per cubic meter

As discussed above, DWR has identified several environmental commitments to reduce construction-related particulate matter in the SMAQMD (see Appendix 3B, *Environmental Commitments*). While these commitments will reduce localized particulate matter emissions, concentrations at the analyzed receptor locations would still exceed SMAQMD's 24-hour PM10 threshold. The receptors exposed to PM10 concentrations in excess of SMAQMD's threshold could experience increased risk for adverse human health effects. Mitigation Measure AQ-9 is available to address this effect.

CEQA Conclusion: Respirable particulates pose human health hazard by bypassing the defenses within the mucous ciliary system and entering deep lung tissue. Construction of Alternative 1B would result in PM10 concentrations at 94 receptor locations that are above the significance thresholds established by the SMAQMD. As such, localized particulate matter concentrations at analyzed receptors would result in significant human health impacts. Mitigation Measure AQ-9 outlines a tiered strategy to reduce PM10 concentrations and public exposure to a less-than-significant level.

Mitigation Measure AQ-9: Implement Measures to Reduce Re-Entrained Road Dust and Receptor Exposure to PM2.5 and PM10

Please see Mitigation Measure AQ-9 under Impact AQ-9 in the discussion of Alternative 1A.

Impact AQ-10: Exposure of Sensitive Receptors to Health Hazards from Localized Particulate Matter in Excess of YSAQMD's Health-Based Concentration Thresholds

NEPA Effects: As shown in Table 22-31, construction would increase PM10 and PM2.5 emissions in YSAQMD, which may pose inhalation-related health risks for receptors exposed to certain concentrations.

PM2.5 and PM10 concentrations at sensitive receptors locations were assessed using the EPA's AERMOD dispersion. The methodology described in Section 22.3.1.3 provides a more detailed summary of the approach used to conduct the analysis. Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, provides an in-depth discussion of the methodology and results.

As shown in Table 22-34, maximum predicted PM2.5 and PM10 concentrations are less than YSAQMD's adopted thresholds. The project would also implement all air district recommended onsite fugitive dust controls, such as regular watering. Accordingly, this alternative's effect of exposure of sensitive receptors to localized particulate matter concentrations would not be adverse.

Table 22-34. Alternative 1B PM10 and PM2.5 Concentration Results in YSAQMD

	PM10		PM2.5	
Parameter	Annual (μg/m³)	24-Hour (μg/m³)	Annual (μg/m³)	24-Hour (μg/m³)
Maximum Value	0.2	6.6	0.03	1.1
YSAQMD Threshold	*20*	*50*	*12*	*35*

Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions,* includes modeling results for all receptors.
μg/m³ = micrograms per cubic meter

CEQA Conclusion: Respirable particulates pose human health hazard by bypassing the defenses within the mucous ciliary system and entering deep lung tissue. Construction of Alternative 1B would result in PM2.5 and PM10 concentrations at receptor locations that are below the significance thresholds adopted by the YSAQMD. As such, localized particulate matter concentrations at analyzed receptors would not result in significant human health impacts. No mitigation is required.

Impact AQ-11: Exposure of Sensitive Receptors to Health Hazards from Localized Particulate Matter in Excess of BAAQMD's Health-Based Concentration Thresholds

NEPA Effects: As shown in Table 22-30, construction would increase PM10 and PM2.5 emissions in BAAQMD, which may pose inhalation-related health risks for receptors exposed to certain concentrations.

PM2.5 and PM10 concentrations at sensitive receptors locations were assessed using the EPA's AERMOD dispersion. The methodology described in Section 22.3.1.3 provides a more detailed summary of the approach used to conduct the analysis. Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, provides an in-depth discussion of the methodology and results.

As shown in Table 22-35, maximum predicted PM2.5 concentrations are less than BAAQMD's adopted threshold. The project would also implement all air district recommended onsite fugitive dust controls, such as regular watering. Accordingly, this alternative's effect of exposure of sensitive receptors to localized particulate matter concentrations would not be adverse.

Table 22-35. Alternative 1B PM10 and PM2.5 Concentration Results in BAAQMD

	PM10		PM2.5	
Parameter	Annual (μg/m³)	24-Hour (μg/m³)	Annual (μg/m³)	24-Hour (μg/m³)
Maximum Value	0.2	53	0.04	9
BAAQMD Threshold	-	-	*0.3*	-

Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions,* includes modeling results for all receptors.
μg/m³ = micrograms per cubic meter

CEQA Conclusion: Respirable particulates pose human health hazard by bypassing the defenses within the mucous ciliary system and entering deep lung tissue. Construction of Alternative 1B would result in PM2.5 and PM10 concentrations at receptor locations that are below the significance

thresholds established by the BAAQMD. As such, localized particulate matter concentrations at analyzed receptors would not result in significant human health impacts. No mitigation is required.

Impact AQ-12: Exposure of Sensitive Receptors to Health Hazards from Localized Particulate Matter in Excess of SJVAPCD's Health-Based Concentration Thresholds

NEPA Effects: As shown in Table 22-30, construction would increase PM10 and PM2.5 emissions in SJVAPCD, which may pose inhalation-related health risks for receptors exposed to certain concentrations.

PM2.5 and PM10 concentrations at sensitive receptors locations were assessed using the EPA's AERMOD dispersion. The methodology described in Section 22.3.1.3 provides a more detailed summary of the approach used to conduct the analysis. Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, provides an in-depth discussion of the methodology and results.

As shown in Table 22-36, maximum predicted annual PM2.5 and PM10 concentrations are less than SJVAPCD's adopted thresholds. However, the 24-hour concentrations of PM10 and PM2.5 were found to exceed the SJVAPCD's significance thresholds. A total of 108 receptor locations were found to exceed the SJVAPCD's 24-hour PM10 significance threshold and two locations were found to exceed the PM2.5 significance threshold. The primary emission sources that contribute toward the exceedances are construction of the intakes.

As discussed above, DWR has identified several environmental commitments to reduce construction-related particulate matter in the SJVAPCD (see Appendix 3B, *Environmental Commitments*). While these commitments will reduce localized particulate matter emissions, concentrations at receptor locations may still exceed SJVAPCD's 24-hour PM10 and PM2.5 threshold. The receptors exposed to PM10 concentrations in excess of SJVAPCD's threshold could experience increased risk for adverse human health effects. Mitigation Measure AQ-9 is available to address this effect.

Table 22-36. Alternative 1B PM10 and PM2.5 Concentration Results in SJVAPCD

	PM10		PM2.5	
Parameter	Annual (μg/m³)	24-Hour (μg/m³)	Annual (μg/m³)	24-Hour (μg/m³)
Maximum Value	0.7	<u>88</u>	0.1	<u>13</u>
SJVAPCD Threshold	*2.08*	*10.4*	*2.08*	*10.4*

Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions,* includes modeling results for all receptors.
μg/m³ = micrograms per cubic meter

CEQA Conclusion: Respirable particulates pose human health hazard by bypassing the defenses within the mucous ciliary system and entering deep lung tissue. Construction of Alternative 1B would result in PM10 and PM2.5 concentrations at receptor locations that are above the significance thresholds established by the SJVAPCD. As such, localized particulate matter concentrations at analyzed receptors would result in significant human health impacts. Mitigation Measure AQ-9 outlines a tiered strategy to reduce PM10 concentrations and public exposure to a less-than-significant level.

Mitigation Measure AQ-9: Implement Measures to Reduce Re-Entrained Road Dust and Receptor Exposure to PM2.5 and PM10

Please see Mitigation Measure AQ-9 under Impact AQ-9 in the discussion of Alternative 1A.

Impact AQ-13: Exposure of Sensitive Receptors to Health Hazards from Localized Carbon Monoxide

NEPA Effects: Continuous engine exhaust may elevate localized CO concentrations. Receptors exposed to these CO "hot-spots" may have a greater likelihood of developing adverse health effects (as described in Section 22.1.2). CO hot-spots are typically observed at heavily congested intersections where a substantial number of gasoline-powered vehicles idle for prolonged durations throughout the day. Construction sites are less likely to result in localized CO hot-spots due to the nature of construction activities (Sacramento Metropolitan Air Quality Management District 2014), which normally utilize diesel-powered equipment for intermittent or short durations. Moreover, construction sites must comply with the Occupational Safety and Health Administration's (OSHA) CO exposure standards for onsite workers. Unlike regional pollutants (e.g., ROG and NO_X), CO concentrations also dissipate as a function of distance and will therefore be lower at offsite receptor locations. Accordingly, given that construction activities typically do not result in CO hot-spots, onsite concentrations must comply with OSHA standards, and CO levels dissipate as a function of distance, equipment-generated CO emissions (see Table 22-30) are not anticipated to result in adverse health hazards to sensitive receptors.

Construction traffic may contribute to increased roadway congestion, which could lead to conditions conducive to CO hot-spot formation. As shown in Table 19-17, the highest peak hour traffic volumes under BPBGPP—11,968 vehicles per hour—would occur on westbound Interstate 80 between Suisun Valley Road and State Route 12. This is about half of the congested traffic volume modeled by BAAQMD (24,000 vehicles per hour) that would be needed to contribute to a localized CO hot-spot, and less than half of the traffic volume modeled by SMAQMD (31,600 vehicles per hour). The BAAQMD's and SMAQMD's CO screening criteria were developed based on County average vehicle fleets that are primarily comprised of gasoline vehicles. Construction vehicles would be predominantly diesel trucks, which generate fewer CO emissions per idle-hour and vehicle mile traveled than gasoline-powered vehicles. Accordingly, the air district screening thresholds provide a conservative evaluation threshold for the assessment of potential CO emissions impacts during construction.

Based on the above analysis, even if all 11,968 vehicles on the modeled traffic segment drove through the same intersection in the peak hour, CO concentrations adjacent to the traveled way would not exceed the CAAQS or NAAQS according to BAAQMD's and SMAQMD's screening criteria. Thus, construction traffic is not anticipated to result in adverse health hazards to sensitive receptors.

CEQA Conclusion: Continuous engine exhaust may elevate localized CO concentrations. Receptors exposed to these CO "hot-spots" may have a greater likelihood of developing adverse health effects. Construction sites are less likely to result in localized CO hot-spots due to the nature of construction activities (Sacramento Metropolitan Air Quality Management District 2014), which normally utilize diesel-powered equipment for intermittent or short durations. Moreover, construction sites must comply with the OSHA CO exposure standards for onsite workers. Accordingly, given that construction activities typically do not result in CO hot-spots, onsite concentrations must comply with OSHA standards, and CO levels dissipate as a function of distance, equipment-generated CO emissions are not anticipated to result in significant health hazards to sensitive receptors. Similarly, peak-hour construction traffic on local roadways would not exceed BAAQMD's or SMAQMD's conservative screening criteria for the formation potential CO hot-spots. This impact would be less than significant. No mitigation is required.,.

Impact AQ-14: Exposure of Sensitive Receptors to Health Hazards from Diesel Particulate Matter in Excess of SMAQMD's Chronic Non-Cancer and Cancer Risk Thresholds

NEPA Effects: As shown in Table 22-30, construction of Alternative 1B would increase DPM emissions in SMAQMD, which poses inhalation-related chronic non-cancer hazard and cancer risks if adjacent receptors are exposed to significant DPM concentrations for prolonged durations.

Receptor exposure to construction DPM emissions was assessed by predicting the health risks in terms of excess cancer and non-cancer hazard impacts using the EPA's AERMOD dispersion modeling and guidance published by OEHHA. Based on HRA results detailed in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, Alternative 1B would not exceed the SMAQMD's thresholds for chronic non-cancer or cancer risks (see Table 22-37), and thus, would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to DPM emissions and their health hazards during construction would not be adverse.

***CEQA Conclusion*:** DPM generated during construction poses inhalation-related chronic non-cancer hazard and cancer risk if adjacent receptors are exposed to significant concentrations for prolonged durations. The DPM generated during Alternative 1B construction would not exceed the SMAQMD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial health hazards. Therefore, this impact for DPM emissions would be less than significant. No mitigation is required.

Table 22-37. Alternative 1B Health Hazards from DPM Exposure in the Sacramento Metropolitan Air Quality Management District

Parameter	Chronic Health Hazard	Cancer Health Risk
Maximum Value at MEI	0.003	9 per million
Thresholds	1	10 per million

Source: Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*.
MEI = maximally exposed individual.

Impact AQ-15: Exposure of Sensitive Receptors to Health Hazards from Diesel Particulate Matter in Excess of YSAQMD's Chronic Non-Cancer and Cancer Risk Thresholds

NEPA Effects: As shown in Table 22-30, construction of Alternative 1B would increase DPM emissions in YSAQMD, which poses inhalation-related chronic non-cancer hazard and cancer risks if adjacent receptors are exposed to significant DPM concentrations for prolonged durations.

Receptor exposure to construction DPM emissions was assessed by predicting the health risks in terms of excess cancer and non-cancer hazard impacts using the EPA's AERMOD dispersion modeling and guidance published by OEHHA. Based on HRA results detailed in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction*

Emissions, Alternative 1B would not exceed YSAQMD's non-cancer or cancer health thresholds (see Table 22-38) and, thus, would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to DPM emissions and their health hazards during construction would not be adverse.

CEQA Conclusion**:** DPM generated during construction poses inhalation-related chronic non-cancer hazard and cancer risk if adjacent receptors are exposed to significant concentrations for prolonged durations. The DPM generated during Alternative 1B construction would not exceed the YSAQMD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial health hazards. Therefore, this impact for DPM emissions would be less than significant. No mitigation is required.

Table 22-38. Alternative 1B Health Hazards from DPM Exposure in the Yolo-Solano Air Quality Management District

Parameter	Chronic Health Hazard	Cancer Health Risk
Maximum Value	0.0014	4 per million
YSAQMD Thresholds	*1*	*10 per million*

Source: Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*

Note: Emissions would not be generated in Yolo County. However, emissions from the adjacent Sacramento County could affect sensitive receptors in Yolo County.

Impact AQ-16: Exposure of Sensitive Receptors to Health Hazards from Diesel Particulate Matter in Excess of BAAQMD's Chronic Non-Cancer and Cancer Risk Thresholds

NEPA Effects: As shown in Table 22-30, construction would increase DPM emissions in the BAAQMD, particularly near sites involving the greatest duration and intensity of construction activities. DPM poses inhalation-related chronic non-cancer hazard and cancer risks if adjacent receptors are exposed to significant DPM concentrations for prolonged durations.

Receptor exposure to construction DPM emissions was assessed by predicting the health risks in terms of excess cancer and non-cancer hazard impacts using the EPA's AERMOD dispersion modeling and guidance published by OEHHA. Based on the HRA results detailed in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, Alternative 1B would not exceed the BAAQMD's chronic non-cancer or cancer thresholds (see Table 22-39) and, thus, would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to DPM emissions and their health hazards during construction would not be adverse.

CEQA Conclusion**:** DPM generated during construction poses inhalation-related chronic non-cancer hazard and cancer risk if adjacent receptors are exposed to significant concentrations for prolonged durations. The DPM generated during Alternative 1B construction would not exceed the BAAQMD's chronic non-cancer or cancer thresholds. Therefore, this impact for DPM emissions would be less than significant. No mitigation is required.

Table 22-39. Alternative 1B Health Hazards from DPM Exposure in the Bay Area Air Quality Management District

Alternative 1B	Chronic Health Hazard	Cancer Health Risk
Maximum Value	0.0017	5 per million
BAAQMD Thresholds	*1*	*10 per million*

Source: Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*

Note: Emissions would not be generated in Yolo County. However, emissions from the adjacent Sacramento County could affect sensitive receptors in Yolo County.

Impact AQ-17: Exposure of Sensitive Receptors to Health Hazards from Diesel Particulate Matter in Excess of SJVAPCD's Chronic Non-Cancer and Cancer Risk Thresholds

NEPA Effects: As shown in Table 22-30, construction would result in an increase of DPM emissions in the SJVAPCD, particularly near sites involving the greatest duration and intensity of construction activities. DPM poses inhalation-related chronic non-cancer hazard and cancer risks if adjacent receptors are exposed to significant DPM concentrations for prolonged durations.

Receptor exposure to construction DPM emissions was assessed by predicting the health risks in terms of excess cancer and non-cancer hazard impacts using the EPA's AERMOD dispersion modeling and guidance published by OEHHA. Based on HRA results detailed in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, Alternative 1B would exceed the SJVAPCD's cancer threshold at two receptors location in the middle of multiple project features (Table 22-40) and, thus, would expose sensitive receptors to substantial pollutant concentrations.

Table 22-40. Alternative 1B Health Hazards from DPM Exposure in the San Joaquin Valley Air Pollution Control District

Alternative 1B	Chronic Health Hazard	Cancer Health Risk
Maximum Value	0.004	<u>15 per million</u>
SJVAPCD Thresholds	*1*	*10 per million*

Source: Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*

Note: Emissions would not be generated in Yolo County. However, emissions from the adjacent Sacramento County could affect sensitive receptors in Yolo County.

As discussed above, DWR has identified several environmental commitments to reduce construction-related diesel particulate matter in the SJVAPCD (see Appendix 3B, Environmental Commitments). While these commitments will reduce localized diesel particulate matter emissions, cancer risk levels were found to exceed the significance threshold at some of the analyzed receptors and those locations could experience increased risk for adverse human health effects. Therefore, this alternative's effect of exposure of sensitive receptors to health hazards during construction would be adverse.

Mitigation Measure AQ-16 would be available to reduce exposure to substantial cancer risk by relocating affected receptors. Although Mitigation Measure AQ-16 would reduce the severity of this effect, the BDCP proponents are not solely responsible for implementation of the measure. If a landowner chooses not to accept DWR's offer of relocation assistance, an adverse effect in the form excess cancer risk above air district thresholds would occur. Therefore, this effect would be adverse. If, however, all landowners accept DWR's offer of relocation assistance, effects would not be adverse.

***CEQA Conclusion*:** DPM generated during construction poses inhalation-related chronic non-cancer hazard and cancer risk if adjacent receptors are exposed to significant concentrations for prolonged durations. The DPM generated during Alternative 1B construction would exceed the SJVAPCD's cancer threshold at two receptor locations, and thus would expose sensitive receptors to substantial pollutant concentrations. Therefore, this impact for DPM emissions would be significant.

Mitigation Measure AQ-16 would be available to reduce exposure to substantial cancer risk by relocating affected receptors. Although Mitigation Measure AQ-16 would reduce the severity of this effect, the BDCP proponents are not solely responsible for implementation of the measure. If a landowner chooses not to accept DWR's offer of relocation assistance, a significant impact in the form excess cancer risk above air district thresholds would occur. Therefore, this effect would be significant and unavoidable. If, however, all landowners accept DWR's offer of relocation assistance, the impact would be less than significant.

Mitigation Measure AQ-16: Relocate Sensitive Receptors to Avoid Excess Cancer Risk

Please see Mitigation Measure AQ-16 under Impact AQ-16 in the discussion of Alternative 1A.

Impact AQ-18: Exposure of Sensitive Receptors to *Coccidioides immitis* (Valley Fever)

***NEPA Effects*:** As discussed under Alternative 1A, earthmoving activities during construction could release *C. immitis* spores if filaments are present and other soil chemistry and climatic conditions are conducive to spore development. Receptors adjacent to the construction area may therefore be exposed to increase risk of inhaling *C. immitis* spores and subsequent development of Valley Fever. Dust-control measures are the primary defense against infection (United States Geological Survey 2000). Implementation of advanced air-district recommended fugitive dust controls outlined in Appendix 3B, *Environmental Commitments*, would avoid dusty conditions and reduce the risk of contracting Valley Fever through routine watering and other controls. Therefore, this alternative's effect of exposure of sensitive receptors to increased Valley Fever risk during construction would not be adverse.

***CEQA Conclusion*:** Construction of the water conveyance facility would involve earthmoving activities that could release *C. immitis* spores if filaments are present and other soil chemistry and climatic conditions are conducive to spore development. Receptors adjacent to the construction area may therefore be exposed to increase risk of inhaling *C. immitis* spores and subsequent development of Valley Fever. Implementation of air-district recommended fugitive dust controls outlined in Appendix 3B, *Environmental Commitments*, would avoid dusty conditions and reduce the risk of contracting Valley Fever through routine watering and other controls. Therefore, this impact would be less than significant. No mitigation is required.

Impact AQ-19: Creation of Potential Odors Affecting a Substantial Number of People during Construction or Operation of the Proposed Water Conveyance Facility

NEPA Effects: As discussed under Alternative 1A, odors from construction activities would be localized and generally confined to the immediate area surrounding the construction site. Moreover, odors would be temporary and localized, and they would cease once construction activities have been completed. Thus, it is not anticipated that construction of CM1 would create objectionable odors from construction equipment or asphalt paving.

Construction of the water conveyance facility would require removal of subsurface material during tunnel excavation and sediment removal. As discussed under Alternative 1A, geotechnical tests indicate that VOC levels in Plan Area soils are below the method detection limits, indicating that organic decay of exposed RTM and sediment will be relatively low (URS 2014). Moreover, drying and stockpiling of the removed RTM and sediment will occur under aerobic conditions, which will further limit any potential decomposition and associated malodorous products. Accordingly, it is not anticipated that tunnel and sediment excavation would create objectionable odors.

Typical facilities known to produce odors include landfills, wastewater treatment plants, food processing facilities, and certain agricultural activities. Alternative 1B would not result in the addition of facilities associated with odors, and as such, long-term operation of the water conveyance facility would not result in objectionable odors.

***CEQA Conclusion*:** Alternative 1B would not result in the addition of major odor producing facilities. Diesel emissions during construction could generate temporary odors, but these would quickly dissipate and cease once construction is completed. Likewise, potential odors generated during asphalt paving would be addressed through mandatory compliance with air district rules and regulations. While tunnel excavation would unearth substantial quantities of RTM, geotechnical tests indicate that soils in the Plan Area have relatively low organic constituents. Moreover, drying and stockpiling of the removed RTM will occur under aerobic conditions, which will further limit any potential decomposition and associated malodorous products. Accordingly, the impact of exposure of sensitive receptors to potential odors would be less than significant. No mitigation is required.

Impact AQ-20: Generation of Criteria Pollutants in the Excess of Federal *De Minimis* Thresholds from Construction and Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: EPA's General Conformity Rule (40 CFR Parts 51 and 93) only applies to Federal actions that are taken in EPA-designated "nonattainment" or "maintenance" areas. Accordingly, as outlined in Section III.A of the General Conformity Rule, "only actions which cause emissions in designated nonattainment and maintenance areas are subject to the regulations". Criteria pollutant emissions resulting from construction and operation of Alternative 1B in the SFNA, SJVAB, and SFBAAB are presented in Table 22-41. Exceedances of the federal *de minimis* thresholds are shown in <u>underlined</u> text.

Sacramento Federal Nonattainment Area

As shown in Table 22-41, implementation of Alternative 1B would exceed the following SFNA federal *de minimis* thresholds:

- ROG: 2023–2024

- NO_X: 2018–2028
- PM10: 2024

ROG and NO_X are precursors to ozone and NO_X is a precursor to PM, for which the SFNA is in nonattainment for the NAAQS. Sacramento County is also a maintenance area for the PM10 NAAQS. Since project emissions exceed the federal *de minimis* thresholds for ROG, NO_X, and PM10, a general conformity determination must be made to demonstrate that total direct and indirect emissions of ROG, NO_X, and PM10 would conform to the appropriate SFNA SIP for each year of construction in which the *de minimis* thresholds are exceeded.

NO_X is also a precursor to PM and can contribute to PM formation. As discussed above, Sacramento County is currently designated maintenance for the PM10 NAAQS and portions of the SVAB are designated nonattainment for the PM2.5 NAAQS. NO_X emissions in excess of 100 tons per year in Sacramento County trigger a secondary PM10 precursor threshold, whereas NO_X emissions in excess of 100 tons per year in the SVAB trigger a secondary PM2.5 precursor threshold. Since NO_X emissions can contribute to PM formation, NO_X emissions in excess of these secondary precursor thresholds could conflict with the applicable PM10 and PM2.5 SIPs. Accordingly, NO_X offsets pursued for the purposes of general conformity for those years in which NO_X emissions exceed 100 tons must occur within the federally designated PM2.5 nonattainment and PM10 maintenance areas of the SVAB.

As shown in Table 22-31, NO_X emissions generated by construction activities in SMAQMD (Sacramento County) would exceed 100 tons per year between 2019 and 2027. The project therefore triggers the secondary PM10 precursor threshold, requiring all NO_X offsets for 2019 through 2027 to occur within Sacramento County.

Given the magnitude of NO_X emissions and the limited geographic scope available for offsets in 2019 through 2027 (Sacramento County), neither Mitigation Measures AQ-1a nor 1b could feasibly reduce NO_X emissions to net zero for the purposes of general conformity.[27] This impact would be adverse. In the event that Alternative 1B is selected as the APA, Reclamation, USFWS, and NMFS would need to demonstrate that conformity is met for NO_X and secondary PM10 formation through a local air quality modeling analysis (i.e., dispersion modeling) or other acceptable methods to ensure project emissions do not cause or contribute to any new violations of the NAAQS or increase the frequency or severity of any existing violations.

Mitigation Measure AQ-1a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-1a under Impact AQ-1 in the discussion of Alternative 1A.

Mitigation Measure AQ-1b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions

[27] The secondary PM precursor thresholds are triggered through the General Conformity Regulation (40 CFR 93.153 (a)(1)). Accordingly, confinement of the geographic scope for available offsets only applies to the General Conformity determination and does not influence mitigation feasibility for Impacts AQ-1 or AQ-28.

within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-1b under Impact AQ-1 in the discussion of Alternative 1A.

Table 22-41. Criteria Pollutant Emissions from Construction and Operation of Alternative 1B in Nonattainment and Maintenance Areas of the SFNA, SJVAB, and SFBAAB (tons/year)

	Sacramento Federal Nonattainment Area					
Year	ROG	NO_X[a]	CO[b]	PM10[c]	PM2.5	SO_2
2016	0	0	0	0	0	0
2017	0	0	0	0	0	0
2018	8	54	0	28	5	<1
2019	18	135	1	52	10	1
2020	13	109	1	30	7	<1
2021	15	123	2	44	9	<1
2022	16	138	6	64	11	1
2023	31	252	6	95	16	2
2024	37	292	6	121	21	2
2025	20	151	4	74	13	1
2026	17	117	3	64	11	1
2027	18	139	4	75	13	1
2028	7	55	5	26	5	<1
2029	0	0	0	0	0	0
ELT	0.18	1.07	2.30	0.36	0.11	0.01
LLT	0.15	0.90	2.20	0.35	0.09	<0.01
De Minimis	*25*	*25*	*100*	*100*	*100*	*100*

	San Joaquin Valley Air Basin					
Year	ROG	NO_X[a]	CO[b]	PM10	PM2.5	SO_2
2016	0	0	0	2	<1	0
2017	0	0	0	0	0	0
2018	13	74	<1	51	8	<1
2019	46	327	<1	118	23	1
2020	30	256	<1	54	13	1
2021	33	273	<1	59	14	1
2022	22	166	<1	42	9	<1
2023	13	86	<1	33	6	<1
2024	11	73	<1	27	5	<1
2025	1	5	<1	8	1	<1
2026	<1	2	<1	3	0	<1
2027	<1	<1	<1	3	1	<1
2028	0	0	0	2	<1	0
2029	0	0	0	0	0	0
ELT	0.00	0.01	0.01	0.00	0.00	0.00
LLT	0.00	0.00	0.01	0.00	0.00	0.00
De Minimis	*10*	*10*	*100*	*100*	*100*	*100*

	San Francisco Bay Area Air Basin					
Year	ROG	NO_X[a]	CO[b]	PM10[d]	PM2.5	SO_2
2016	0	0	0	-	0	0
2017	0	0	0	-	0	0
2018	<1	3	1	-	1	<1
2019	1	10	2	-	1	<1
2020	1	11	2	-	1	<1
2021	1	13	2	-	1	<1
2022	1	12	2	-	2	<1
2023	4	37	5	-	4	<1
2024	8	64	5	-	5	1
2025	5	36	3	-	3	<1
2026	4	32	3	-	3	<1
2027	3	22	2	-	3	<1
2028	<1	2	1	-	1	<1
2029	0	0	0	-	0	0
ELT	0.00	0.00	0.00	-	0.00	0.00
LLT	0.00	0.00	0.00	-	0.00	0.00
De Minimis	*100*	*100*	*100*	-	*100*	*100*

Notes

[a] NO_X emissions in excess of 100 tons per year within federally designated PM10 and PM2.5 nonattainment or maintenance areas trigger a secondary PM10 and PM2.5 precursor threshold. NOX emissions in excess of this secondary threshold could conflict with the applicable PM10 and PM2.5 SIPs. Accordingly, NO_X offsets pursued for the purposes of general conformity for those years in which NO_X emissions exceed 100 tons must occur within the federally designated PM2.5 nonattainment and PM10 maintenance areas, as applicable.

[b] The proposed water conveyance facility is located within a federally designated CO attainment area. Accordingly, CO emissions generated by construction of CM1 are not subject to the General Conformity Rule and are excluded from the emissions summary and general conformity analysis (40 CFR Part 51 and 93, Section III.A). Emissions presented in the table are limited those generated by haul trucks, which would occur in federally designated CO maintenance area.

[c] There are no federally designated PM10 maintenance areas in Yolo County. Accordingly, PM10 emissions generated by construction of CM1 in Yolo County are not subject to the General Conformity Rule and are excluded from the emissions summary and general conformity analysis for the SFNA (40 CFR Part 51 and 93, Section III.A). Emissions presented in the table are limited those generated within Sacramento County.

[c] There are no federally designated PM10 nonattainment or maintenance areas in the SFBAAB. Accordingly, PM10 emissions generated by construction of CM1 are not subject to the General Conformity Rule and are excluded from the emissions summary and general conformity analysis (40 CFR Part 51 and 93, Section III.A).

San Joaquin Valley Air Basin

As shown in Table 22-41, implementation of Alternative 1B would exceed the following SJVAB federal *de minimis* thresholds:

- ROG: 2018–2024

- NO_X: 2018–2024
- PM10: 2019

ROG and NO_X are precursors to ozone and NO_X is a precursor to PM, for which the SJVAB is in nonattainment for the NAAQS. The SJVAB is also a maintenance area for the PM10 NAAQS. Since project emissions exceed the federal *de minimis* threshold for ROG, NO_X, and PM10, a general conformity determination must be made to demonstrate that total direct and indirect emissions of ROG, NO_X, and PM10 would conform to the appropriate SJVAB SIP for each year of construction in which the *de minimis* thresholds are exceeded.

NO_X is also a precursor to PM and can contribute to PM formation. As discussed above, the SJVAB is currently designated maintenance for the PM10 NAAQS and nonattainment for the PM2.5 NAAQS. NO_X emissions in excess of 100 tons per year trigger a secondary PM precursor threshold, and could conflict with the applicable PM10 and PM2.5 SIPs. As shown in Table 22-41, NO_X emissions generated by construction activities in the SJVAB would exceed 100 tons per year between 2019 and 2022. NO_X offsets pursued for the purposes of general conformity for those years in which NO_X emissions exceed 100 tons must occur within the federally designated PM2.5 nonattainment and PM10 maintenance areas of the SJVAB, which are consistent with the larger nonattainment boundary for ozone.

As shown in Appendix 22E, *General Conformity Determination,* Attachment 22E-1, SJVAPCD confirms that sufficient emissions reduction credits would be available to fully offset ROG, NO_X, and PM10 emissions in excess of the federal *de minimis* thresholds zero through implementation of Mitigation Measures AQ-4a and 4b. Mitigation Measures AQ-4a and 4b will ensure the requirements of the mitigation and offset program are implemented and conformity requirements for ROG, NO_X, and PM10 are met, should Alternative 1B be selected as the APA.

Mitigation Measure AQ-4a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4a under Impact AQ-4 in the discussion of Alternative 1A.

Mitigation Measure AQ-4b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4b under Impact AQ-4 in the discussion of Alternative 1A.

San Francisco Bay Area Air Basin

As shown in Table 22-41, implementation of Alternative 1B would not exceed any of the SFBAAB federal *de minimis* thresholds. Accordingly, a general conformity determination is not required as total direct and indirect emissions would conform to the appropriate SFBAAB SIPs.

CEQA Conclusion: SFNA and SJVAB are classified as nonattainment or maintenance areas with regard to the ozone and PM10 NAAQS, and the impact of increases in criteria pollutant emissions above the air basin *de minimis* thresholds could conflict with or obstruct implementation of the applicable air quality plans. Since construction emissions in the SFNA and SJVAB would exceed the *de minimis* thresholds for ROG, NO_X, and PM10, this impact would be significant.

Mitigation Measures AQ-4a and AQ-4b would ensure project emissions would not result in an increase in regional ROG, NO_X, or PM10 in the SJVAB. These measures would therefore ensure total direct and indirect ROG, NO_X, and PM10 emissions generated by the project would conform to the appropriate SJVAB SIPs by offsetting the action's emissions in the same or nearby area to net zero. Accordingly, impacts would be less than significant with mitigation in the SJVAB.

Although Mitigation Measures AQ-1a and AQ-1b would reduce NO_X in the SFNA, given the magnitude of NO_X emissions and the limited geographic scope available for offsets (Sacramento County), neither measure could feasibly reduce NO_X emissions to net zero for the purposes of general conformity. This impact would be significant and unavoidable in the SFNA.

Emissions generated within the SFBAAB would not exceed the SFBAAB de minimis thresholds and would therefore conform to the appropriate SFBAAB SIPs. No mitigation is required.

Impact AQ-21: Generation of Cumulative Greenhouse Gas Emissions during Construction of the Proposed Water Conveyance Facility

NEPA Effects: GHG (CO_2, CH_4, N_2O, SF_6, and HFCs) emissions resulting from construction of Alternative 1B are presented in Table 22-42. Emissions with are presented with implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*) and state mandates to reduce GHG emissions. State mandates include the RPS, LCFS, and Pavley. These mandates do not require additional action on the part of DWR, but will contribute to GHG emissions reductions. For example, Pavley and LCFS will improve the fuel efficiency of vehicles and reduce the carbon content of transportation fuels, respectively. Equipment used to construct the project will therefore be cleaner and less GHG intensive than if the state mandates had not been established.

Table 22-42. GHG Emissions from Construction of Alternative 1B (metric tons/year)[a]

Year	Equipment and Vehicles (CO_2e)	Electricity (CO_2e)	Concrete Batching (CO_2)	Total CO_2e
2016	0	0	409	409
2017	0	0	0	0
2018	56,832	185	50,761	107,777
2019	175,639	1,033	7,973	184,645
2020	106,574	4,960	49,542	161,077
2021	118,358	13,206	98,263	229,827
2022	103,839	18,545	148,933	271,317
2023	135,968	16,508	145,408	297,885
2024	152,412	17,220	173,968	343,600
2025	71,433	11,616	116,167	199,217
2026	61,396	4,147	27,838	93,382
2027	61,806	792	40,147	102,745
2028	27,294	21	7,899	35,214
2029	0	1	0	1
Total	*1,071,552*	*88,234*	*867,307*	*2,027,094*

[a] Emissions estimates do not account for GHG flux from land disturbance. Surface and subsurface (e.g., tunneling) activities may oxidize peat soils, releasing GHG emissions. However, recent geotechnical surveys indicated that peat is negligible below 80 feet of depth. The tunnel will be placed below this range and the design adjusted if peat soils are discovered. Peat material encountered during surface excavation for non-tunnel work will be covered with top soil to reduce oxidation when needed.

Values may not total correctly due to rounding.

Table 22-43 summarizes GHG emissions that would be generated in the BAAQMD, SMAQMD, SJVAPCD, and YSAQMD. The table does not include emissions from electricity generation as these emissions would be generated by power plants located throughout the state and the specific location of electricity-generating facilities is unknown (see discussion preceding this impact analysis). Due to the global nature of GHGs, the determination of effects is based on total emissions generated by construction (Table 22-43). GHG emissions presented in Table 22-43 are therefore provided for information purposes only.

Table 22-43. Total GHG Emissions from Construction of Alternative 1B by Air District (metric tons/year)

Year	Equipment and Vehicles (CO_2e)	Concrete Batching (CO_2)[a]	Total CO_2e[b]
SMAQMD	467,865	433,654	901,518
YSAQMD	58,320	0	58,320
SJVAPCD	398,330	433,654	831,983
BAAQMD	147,038	0	147,038

[a] Emissions assigned to each air district based on the number of batching plants located in that air district.

[b] Values may not total correctly due to rounding.

Construction of Alternative 1B would generate a total of 2.0 metric tons of GHG emissions after implementation of environmental commitments and state mandates (see Appendix 3B, *Environmental Commitments*). This is equivalent to adding 427,000 typical passenger vehicles to the road during construction (U.S. Environmental Protection Agency 2014e). As discussed in section 22.3.2, *Determination of Effects*, any increase in emissions above net zero associated with construction of the BDCP water conveyance features would be adverse. Accordingly, this effect would be adverse. Mitigation Measure AQ-21, which would develop a GHG Mitigation Program to reduce construction-related GHG emissions to net zero, is available address this effect.

***CEQA Conclusion*:** Construction of Alternative 1B would generate a total of 2.0 metric tons of GHG emissions. This is equivalent to adding 427,000 typical passenger vehicles to the road during construction (U.S. Environmental Protection Agency 2014e). As discussed in section 22.3.2, *Determination of Effects*, any increase in emissions above net zero associated with construction of the BDCP water conveyance features would be significant. Mitigation Measure AQ-21 would develop a GHG Mitigation Program to reduce construction-related GHG emissions to net zero. Accordingly, this impact would be less-than-significant with implementation of Mitigation Measure AQ-21.

Mitigation Measure AQ-21: Develop and Implement a GHG Mitigation Program to Reduce Construction Related GHG Emissions to Net Zero (0)

Please see Mitigation Measure AQ-21 under Impact AQ-21 in the discussion of Alternative 1A.

Impact AQ-22: Generation of Cumulative Greenhouse Gas Emissions from Operation and Maintenance of the Proposed Water Conveyance Facility and Increased Pumping

NEPA Effects: Operation of Alternative 1B would generate direct and indirect GHG emissions. Sources of direct emissions include heavy-duty equipment, on road crew trucks, and employee vehicle traffic. Indirect emissions would be generated predominantly by electricity consumption required for pumping as well as, maintenance, lighting, and other activities.

Table 22-44 summarizes long-term operational GHG emissions associated with operations, maintenance, and increased SWP pumping. Emissions were quantified for both ELT and LLT conditions, although activities would take place annually until project decommissioning. Emissions include state mandates to reduce GHG emissions (described in Impact AQ-21) are presented (there are no BDCP specific operational environmental commitments). Total CO_2e emissions are compared to both the No Action Alternative (NEPA point of comparison) and Existing Conditions (CEQA baseline). As discussed in Section 22.3.1.2, equipment emissions are assumed to be zero under both the No Action Alternative (NEPA point of comparison) and Existing Conditions (CEQA baseline). The equipment emissions presented in Table 22-44 are therefore representative of project impacts for both the NEPA and CEQA analysis.

Table 22-44. GHG Emissions from Operation, Maintenance, and Increased SWP Pumping, Alternative 1B (metric tons/year)

Condition	Equipment CO_2e	SWP Electricity CO_2e NEPA Point of Comparison	SWP Electricity CO_2e CEQA Baseline	Total CO_2e NEPA Point of Comparison	Total CO_2e CEQA Baseline
ELT	436	-	224,103	-	224,538
LLT	418	62,754	24,293	63,172	24,712

Note: The *NEPA point of comparison* compares total CO_2e emissions after implementation of Alternative 1B to the No Action Alternative, whereas the *CEQA baseline* compares total CO_2e emissions to Existing Conditions.

Table 22-45 summarizes equipment CO_2e emissions that would be generated in the BAAQMD, SMAQMD, and SJVAPCD (no emissions would be generated in the YSAQMD). The table does not include emissions from SWP pumping as these emissions would be generated by power plants located throughout the state (see discussion preceding this impact analysis). GHG emissions presented in Table 22-45 are therefore provided for information purposes only.

SWP Operational and Maintenance GHG Emissions Analysis

Alternative 1B would add approximately 1,583 GWh[28] of additional net electricity demand to operation of the SWP each year assuming 2060 conditions. Conditions at 2060 (LLT) are used for this analysis because they yield the largest potential additional net electricity requirements and therefore represent the largest potential impact. This 1,583 GWh is based on assumptions of future conditions and operations and includes all additional energy required to operate the project with BDCP Alternative 1B including any additional energy associated with additional water being moved through the system.

Table 22-45. Equipment CO_2e Emissions from Operation and Maintenance of Alternative 1B by Air District (metric tons/year)[a]

Air District	ELT	LLT
SMAQMD	431	414
SJVAPCD	3	3
BAAQMD	2	2
Total	436	418

[a] Emissions do not include emissions generated by increased SWP pumping.

In the CAP, DWR developed estimates of historical, current, and future GHG emissions. Figure 22-5 shows those emissions as they were projected in the CAP and how those emissions projections would change with the additional electricity demands needed to operate the SWP with the addition of BDCP Alternative 1B. As shown in Figure 22-5, in 2024, the year BDCP Alternative 1B is projected to go online, DWR total emissions jump from around 912,000 metric tons of CO_2e to 1.6 million

[28] Estimated net energy demand differs slightly from what is presented in Chapter 21, *Energy*. This is because the above analysis includes energy needed for transmission and distribution of water along the Valley String, which is required to enable a comparison with the assumptions in DWR's CAP.

metric tons of CO_2e. This elevated level is approximately 340,000 metric tons of CO_2e above DWR's designated GHG emissions reduction trajectory (red line, which is the linear interpolation between DWR's 2020 GHG emissions goal and DWR's 2050 GHG emissions goal.) The projection indicates that after the initial jump in emissions, existing GHG emissions reduction measures would bring the elevated GHG emissions level back down below DWR's GHG emissions reduction trajectory by 2043 and that DWR would still achieve its GHG emission reduction goal by 2050.

Because employing only DWR's existing GHG emissions reduction measures would result in a large initial increase in emissions and result in DWR emissions exceeding the emissions reduction trajectory for several years, DWR will take additional actions to reduce GHG emissions if BDCP Alternative 1B is implemented.

The CAP sets forth DWR's plan to manage its activities and operations to achieve its GHG emissions reduction goals. The CAP commits DWR to monitoring its emissions each year and evaluating its emissions every five years to determine whether it is on a trajectory to achieve its GHG emissions reduction goals. If it appears that DWR will not meet the GHG emission reduction goals established in the plan, DWR may make adjustments to existing emissions reduction measures, devise new measures to ensure achievement of the goals, or take other action. Given the scale of additional emissions that BDCP Alternative 1B would add to DWR's total GHG emissions, DWR has evaluated the most likely method that it would use to compensate for such an increase in GHG emissions: modification of DWR's REPP. The DWR REPP (GHG emissions reduction measure OP-1 in the CAP) describes the amount of additional renewable energy that DWR expects to purchase each year to meet its GHG emissions reduction goals. The REPP lays out a long-term strategy for renewable energy purchases, though actual purchases of renewable energy may not exactly follow the schedule in the REPP and will ultimately be governed by actual operations, measured emissions, and contracting.

Table 22-46 below shows how the REPP could be modified to accommodate BDCP Alternative 1B, and shows that additional renewable energy resources could be purchased during years 2022–2025 over what was programmed in the original REPP. The net result of this change is that by 2026 DWR's energy portfolio would contain nearly 1600 GWh of renewable energy (in addition to hydropower generated at SWP facilities). This amount is nearly twice the amount called for in the original DWR REPP (1,592 compared to 792). In later years, 2031–2050, DWR would bring on slightly fewer additional renewable resources than programmed in the original REPP; however, over 10,000 additional GWh of electricity would be purchased under the modified REPP during the 40 year period 2011–2050 then under the original REPP. Figure 22-6 shows how this modified Renewable Energy Procurement Plan would affect DWR's projected future emissions with BDCP Alternative 1B.

Table 22-46. Changes in Expected Renewable Energy Purchases 2011–2050 (Alternative 1B)

	Additional GWh of Renewable Power Purchased (Above previous year)	
Year(s)	Original REPP	New REPP
2011–2020	36	36
2021	72	72
2022–2025	72	272
2026–2030	72	72
2031–2040	108	58
2041–2050	144	74
Total Cumulative	52,236	63,036

As shown in the analysis above and consistent with the analysis contained in the CAP and associated Initial Study and Negative Declaration for the CAP, BDCP Alternative 1B would not adversely affect DWR's ability to achieve the GHG emissions reduction goals set forth in the CAP. Further, Alternative 1B would not conflict with any of DWR's specific action GHG emissions reduction measures and implements all applicable project level GHG emissions reduction measures as set forth in the CAP. BDCP Alternative 1B is therefore consistent with the analysis performed in the CAP. There would be no adverse effect.

***CEQA Conclusion*:** SWP GHG emissions currently are below 1990 levels and achievement of the goals of the CAP means that total DWR GHG emissions will be reduced to 50% of 1990 levels by 2020 and to 80% of 1990 levels by 2050. The implementation of BDCP Alternative 1B would not affect DWR's established emissions reduction goals or baseline (1990) emissions and therefore would not result in a change in total DWR emissions that would be considered significant. Prior adoption of the CAP by DWR already provides a commitment on the part of DWR to make all necessary modifications to DWR's REPP (as described above) or any other GHG emission reduction measure in the CAP that are necessary to achieve DWR's GHG emissions reduction goals. Therefore no amendment to the approved CAP is necessary to ensure the occurrence of the additional GHG emissions reduction activities needed to account for BDCP-related operational emissions. The effect of BDCP Alternative 1B with respect to GHG emissions is less than cumulatively considerable and therefore less than significant. No mitigation is required.

Impact AQ-23: Generation of Cumulative Greenhouse Gas Emissions from Increased CVP Pumping as a Result of Implementation of CM1

NEPA Effects: As previously discussed, DWR's CAP cannot be used to evaluate environmental impacts associated with increased CVP pumping, as emissions associated with CVP are not under DWR's control and are not included in the CAP. Accordingly, GHG emissions resulting from increased CVP energy use are evaluated separately from GHG emissions generated as a result of SWP energy use.

Under Alternative 1B, operation of the CVP yields the generation of clean, GHG emissions-free, hydroelectric energy. This electricity is sold into the California electricity market or directly to energy users. Analysis of the No Action Alternative indicates that the CVP generates and will continue to generate all of the electricity needed to operate the CVP system and approximately 3,500 GWh of excess hydroelectric energy that would be sold to energy users throughout California. Implementation of Alternative 1B, however, would result in an increase of 167 GWh in the demand for CVP generated electricity, which would result in a reduction of 167 GWh or electricity available for sale from the CVP to electricity users. This reduction in the supply of GHG emissions-free electricity to the California electricity users could result in a potential effect impact of the project, as these electricity users would have to acquire substitute electricity supplies that may result in GHG emissions (although additional conservation is also a possible outcome as well).

It is unknown what type of power source (e.g., renewable, natural gas) would be substituted for CVP electricity or if some of the lost power would be made up with higher efficiency. Given State mandates for renewable energy and incentives for energy efficiency, it is possible that a considerable amount of this power would be replaced by renewable resources or would cease to be needed as a result of higher efficiency. However, to ensure a conservative analysis, indirect emissions were quantified for the entire quantity of electricity (167 GWh) using the current and future statewide energy mix (adjusted to reflect RPS) (please refer to Appendix 22A, *Air Quality Analysis Methodology,* for additional detail on quantification methods).

Substitution of 167 GWh of electricity with a mix of sources similar to the current statewide mix would result in emissions of 46,714 metric tons of CO_2e; however, under expected future conditions (after full implementation of the RPS), emissions would be 36,300 metric tons of CO_2e.

Use of CVP hydroelectricity to meet increased electricity demand from operation of CVP facilities associated with Alternative 1B would reduce available CVP hydroelectricity to other California electricity users. Substitution of the lost electricity with electricity from other sources could indirectly result in an increase of GHG emissions that is comparable or larger than the level of GHG emissions that trigger mandatory GHG reporting for major facilities. As a result, these emissions could contribute to a cumulatively considerable effect and are therefore adverse. However, these emissions would be caused by dozens of independent electricity users, who had previously bought CVP power, making decisions about different ways to substitute for the lost power. These decisions are beyond the control of Reclamation or any of the other BDCP Lead Agencies. Further, monitoring to determine the actual indirect change in emissions as a result of BDCP actions would not be feasible. In light of the impossibility of predicting where any additional emissions would occur, as well as Reclamation's lack of regulatory authority over the purchasers of power in the open market, no workable mitigation is available or feasible.

***CEQA Conclusion*:** Operation of the CVP is a federal activity beyond the control of any State agency such as DWR, and the power purchases by private entities or public utilities in the private marketplace necessitated by a reduction in available CVP-generated hydroelectric power are beyond the control of the State, just as they are beyond the control of Reclamation. For these reasons, there are no feasible mitigation measures that could reduce this potentially significant indirect impact, which is solely attributable to operations of the CVP and not the SWP, to a less than significant level. This impact is therefore determined to be significant and unavoidable**.**

Impact AQ-24: Generation of Regional Criteria Pollutants from Implementation of CM2–CM11

NEPA Effects: Table 22-29 summarizes potential construction and operational emissions that may be generated by implementation of CM2–CM11. See the discussion of Impact AQ-24 under Alternative 1A.

Criteria pollutants from restoration and enhancement actions could exceed applicable general conformity *de minimis* levels and applicable local thresholds. The effect would vary according to the equipment used in construction of a specific conservation measure, the location, the timing of the actions called for in the conservation measure, and the air quality conditions at the time of implementation; these effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. The effect of increases in emissions during implementation of CM2–CM11 in excess of applicable general conformity *de minimis* levels and air district regional thresholds (Table 22-8) could violate air basin SIPs and worsen existing air quality conditions. Mitigation Measure AQ-24 would be available to reduce this effect, but emissions would still be adverse.

***CEQA Conclusion*:** Construction and operational emissions associated with the restoration and enhancement actions would result in a significant impact if the incremental difference, or increase, relative to Existing Conditions exceeds the applicable local air district thresholds shown in Table 22-8; these effects are expected to be further evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measure AQ-24 would be available to reduce this effect, but may not be sufficient to reduce emissions below applicable air quality management district thresholds (see Table 22-8). Consequently, this impact would be significant and unavoidable.

Mitigation Measure AQ-24: Develop an Air Quality Mitigation Plan (AQMP) to Ensure Air District Regulations and Recommended Mitigation are Incorporated into Future Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-24 under Impact AQ-24 in the discussion of Alternative 1A.

Impact AQ-25: Exposure of Sensitive Receptors to Health Hazards from Localized Particulate Matter, Carbon Monoxide, and Diesel Particulate Matter from Implementation of CM2–CM11

NEPA Effects: The potential for Alternative 1B to expose sensitive receptors increased health hazards from localized PM, CO, and DPM would be similar to Alternative 1A. Activities shown in Table 22-29 with the greatest potential to have short or long-term air quality impacts are also anticipated to have the greatest potential to expose receptors to substantial pollutant concentrations. The effect would vary according to the equipment used, the location and timing of the actions called for in the conservation measure, the meteorological and air quality conditions at the time of implementation, and the location of receptors relative to the emission source. Potential health effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions.

The effect of increases in PM, CO, or DPM (cancer and non-cancer-risk) in excess of applicable air district thresholds (Table 22-8) at receptor locations could result in adverse health impacts. Mitigation Measures AQ-24 and AQ-25 would be available to reduce this effect.

***CEQA Conclusion*:** Construction and operational emissions associated with the restoration and enhancement actions under Alternative 1B would result in a significant impact if PM, CO, or DPM (cancer and non-cancer-risk) concentrations at receptor locations exceed the applicable local air district thresholds shown in Table 22-8; these effects are expected to be further evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measures AQ-24 and AQ-25 would ensure localized concentrations at receptor locations would be below applicable air quality management district thresholds (see Table 22-8). Consequently, this impact would be less than significant.

Mitigation Measure AQ-24: Develop an Air Quality Mitigation Plan (AQMP) to Ensure Air District Regulations and Recommended Mitigation are Incorporated into Future Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-24 under Impact AQ-24 in the discussion of Alternative 1A.

Mitigation Measure AQ-25: Prepare a Project-Level Health Risk Assessment to Reduce Potential Health Risks from Exposure to Localized DPM and PM Concentrations

Please see Mitigation Measure AQ-25 under Impact AQ-25 in the discussion of Alternative 1A.

Impact AQ-26: Creation of Potential Odors Affecting a Substantial Number of People from Implementation of CM2–CM11

NEPA Effects: The potential for Alternative 1B to expose sensitive receptors increased odors would be similar to Alternative 1A. Accordingly, construction activities associated with CM2-CM11 are not anticipated to result in nuisance odors. Similarly, while restored land uses associated with the program have the potential to generate odors from natural processes, the emissions would be similar in origin and magnitude to the existing land use types in the restored area (e.g., managed wetlands). Moreover, specific odor effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Accordingly, odor-related effects associated with CM2–CM11 would not be adverse.

***CEQA Conclusion*:** Alternative 1B would not result in the addition of major odor producing facilities. Diesel emissions during construction could generate temporary odors, but these would quickly dissipate and cease once construction is completed. Increases in wetland, tidal, and upland habitats may increase the potential for odors from natural processes. However, the origin and magnitude of odors would be similar to the existing land use types in the restored area (e.g., managed wetlands). Moreover, specific odor impacts would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Accordingly, the impact of exposure of sensitive receptors to potential odors would be less than significant. No mitigation is required.

Impact AQ-27: Generation of Cumulative Greenhouse Gas Emissions from Implementation of CM2–CM11

NEPA Effects: CM2–CM11CM2–CM11 implemented under Alternative 1B would result in local GHG emissions from construction equipment and vehicle exhaust, similar to Alternative 1A. Restoration activities with the greatest potential for emissions include those that break ground and require use of earthmoving equipment. The type of restoration action and related construction equipment use are shown in Table 22-29. Implementing CM2–CM11 would also affect long-term sequestration rates through land use changes, such as conversion of agricultural land to wetlands, inundation of peat soils, drainage of peat soils, and removal or planting of carbon-sequestering plants.

Without additional information on site-specific characteristics associated with each of the restoration components, a complete assessment of GHG flux from CM2–CM11 is currently not possible. The effect of carbon sequestration and CH_4 generation would vary by land use type, season, and chemical and biological characteristics; these effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measures AQ-24 and AQ-27 would be available to reduce this

effect. However, due to the potential for increases in GHG emissions from construction and land use change, this effect would be adverse.

***CEQA Conclusion*:** The restoration and enhancement actions under Alternative 1B could result in a significant impact if activities are inconsistent with applicable GHG reduction plans, do not contribute to a lower carbon future, or generate excessive emissions, relative to other projects throughout the state. These effects are expected to be further evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measures AQ-24 and AQ-27 would be available to reduce this impact, but may not be sufficient to reduce to a less-than-significant level. Consequently, this impact would be significant and unavoidable.

Mitigation Measure AQ-24: Develop an Air Quality Mitigation Plan (AQMP) to Ensure Air District Regulations and Recommended Mitigation are Incorporated into Future Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-24 under Impact AQ-24 in the discussion of Alternative 1A.

Mitigation Measure AQ-27: Prepare a Land Use Sequestration Analysis to Quantify and Mitigate (as Needed) GHG Flux Associated with Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-27 under Impact AQ-27 in the discussion of Alternative 1A.

22.3.3.4 Alternative 1C—Dual Conveyance with West Alignment and Intakes W1–W5 (15,000 cfs; Operational Scenario A)

A total of five intakes would be constructed under Alternative 1C. They would be sited on the west bank of the Sacramento River, opposite the locations identified for the pipeline/tunnel and east alignments. Under this alternative, water would be carried south in a canal along the western side of the Delta to an intermediate pumping plant and then pumped through a tunnel to a continuing canal to the proposed Byron Tract Forebay immediately northwest of Clifton Court Forebay (Figures 3-6 and 3-7 in Chapter 3, *Description of Alternatives*).

Construction and operation of Alternative 1C would require the use of electricity, which would be supplied by the California electrical grid. Power plants located throughout the state supply the grid with power, which will be distributed to the Study area to meet project demand. Power supplied by statewide power plants will generate criteria pollutants. Because these power plants are located throughout the state, criteria pollutant emissions associated with Alternative 1C electricity demand cannot be ascribed to a specific air basin or air district within the Study area. Criteria pollutant emissions from electricity consumption, which are summarized in Table 22-47, are therefore provided for informational purposes only and are not included in the impact conclusion.

Table 22-47. Criteria Pollutant Emissions from Electricity Consumption: Construction and Net Project Operations, Alternative 1C (tons/year) [a,b]

Year	Analysis	ROG	CO	NO_X	PM10	PM2.5[c]	SO_2
2016	-	0	0	0	0	0	0
2017	-	0	0	0	0	0	0
2018	-	<1	<1	<1	<1	<1	<1
2019	-	<1	1	<1	<1	<1	1
2020	-	<1	7	1	1	1	3
2021	-	<1	19	1	2	2	8
2022	-	<1	26	2	2	2	11
2023	-	<1	23	2	2	2	10
2024	-	<1	24	2	2	2	10
2025	-	<1	16	1	1	1	7
2026	-	<1	6	<1	<1	<1	2
2027	-	<1	1	<1	<1	<1	<1
2028	-	<1	<1	<1	<1	<1	<1
2029	-	<1	<1	<1	<1	<1	<1
ELT	CEQA	2	17	232	20	20	98
LLT	NEPA	2	21	286	24	24	121
LLT	CEQA	1	9	120	10	10	51

NEPA = Compares criteria pollutant emissions after implementation of Alternative 1C to the No Action Alternative.

CEQA = Compares criteria pollutant emissions after implementation of Alternative 1C to Existing Conditions.

[a] Emissions assume implementation of RPS (see Appendix 22A, *Air Quality Analysis Methodology*). Power plants that generate electricity for the proposed project would be subject to local air district permitting requirements, including standards to implement BACT to reduce criteria pollutant emissions.

[b] Because GHG emissions are cumulative (see Section 22.3.2.1) and not evaluated at the local air basin or air district level, they are discussed in Impacts AQ-21 and AQ-22. The GHG analysis for SWP power utilizes actual and forecasted GHG emissions rates for the SWP system, which differs slightly from the above analysis. Statewide grid average emission factors were utilized for the above analysis as criteria pollutant emission factors for SWP were unavailable. Please also note that the above analysis does not account for additional renewable energy that will be procured through modifications to DWR's REPP (see Impact AQ-22). Accordingly, the emissions results presented above represent a conservative assessment of potential criteria pollutant emissions.

[c] Emission factors for PM2.5 are currently unavailable. Consequently, PM2.5 emissions were assumed to equal PM10 emissions. Because PM2.5 represents a fraction of PM10, this approach represents a conservative assessment of PM2.5 emissions from electricity consumption.

Construction activities would generate emissions of ozone precursors (ROG and NO_X), CO, PM10, PM2.5, and SO_2. Table 22-48 summarizes criteria pollutant emissions that would be generated in the BAAQMD, SMAQMD, and YSAQMD in pounds per day and tons per year (no construction emissions would be generated in the SJVAPCD). Emissions estimates include implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*). Although emissions are presented in different units (pounds and tons), the amounts of emissions are identical (i.e., 2,000 pounds is identical to 1 ton). Summarizing emissions in both pounds per day and tons per year is necessary to evaluate project-level effects against the appropriate air district thresholds, which are given in both pounds and tons (see Table 22-8).

As shown in Appendix 22B, *Air Quality Assumptions*, construction activities during several phases will likely occur concurrently. To ensure a conservative analysis, the maximum daily emissions during these periods of overlap were estimated assuming all equipment would operate at the same time—this gives the maximum total project-related air quality impact during construction. Accordingly, the daily emissions estimates represent a conservative assessment of construction impacts. Exceedances of the air district thresholds are shown in underlined text.

Operation and maintenance activities under Alternative 1C would result in emissions of ROG, NO_X, CO, PM10, PM2.5, and SO_2. Emissions were quantified for both ELT and LLT conditions, although activities would take place annually until project decommissioning. Future emissions, in general, are anticipated to lessen because of continuing improvements in vehicle and equipment engine technology.

Table 22-49 summarizes criteria pollutant emissions associated with operation of Alternative 1C in the BAAQMD, SMAQMD, and YSAQMD in pounds per day and tons per year (no operational emissions would be generated in the SJVAPCD). Although emissions are presented in different units (pounds and tons), the amounts of emissions are identical (i.e., 2,000 pounds is identical to 1 ton). Summarizing emissions in both pounds per day and tons per year is necessary to evaluate project-level effects against the appropriate air district thresholds, which are given in both pounds and tons (see Table 22-8).

Table 22-48. Criteria Pollutant Emissions from Construction of Alternative 1C (pounds/day and tons/year)

	Maximum Daily Emissions (pounds/day)										Annual Emissions (tons/year)									
	Bay Area Air Quality Management District										Bay Area Air Quality Management District									
	ROG	NO_X	CO	PM10			PM2.5			SO_2	ROG	NO_X	CO	PM10			PM2.5			SO_2
Year				Exhaust	Dust	Total	Exhaust	Dust	Total					Exhaust	Dust	Total	Exhaust	Dust	Total	
2016	0	0	0	0	57	57	0	9	9	0	0	0	0	0	5	5	0	1	1	0
2017	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2018	297	2,468	2,135	36	1,222	1,258	35	196	230	11	8	60	62	1	43	44	1	6	7	<1
2019	449	3,619	2,973	46	1,433	1,478	44	230	274	15	27	212	182	3	81	85	3	13	16	1
2020	182	1,651	1,144	25	489	514	24	89	113	6	21	175	128	3	44	46	3	7	10	1
2021	210	1,856	1,286	28	612	640	27	108	135	8	25	207	157	3	54	57	3	9	12	1
2022	211	1,799	1,289	26	685	700	25	140	155	9	20	152	129	2	43	46	2	7	10	1
2023	221	1,854	1,553	19	806	822	19	164	180	13	20	144	143	2	51	53	2	9	10	1
2024	269	2,180	1,732	19	829	848	18	162	180	13	23	157	150	2	53	55	2	9	11	1
2025	118	969	731	8	445	453	7	93	100	8	10	66	64	1	27	28	1	5	5	1
2026	76	669	496	5	366	371	5	76	82	6	7	48	43	1	21	22	<1	4	4	<1
2027	60	554	372	6	344	351	6	72	78	6	3	27	22	<1	18	18	<1	3	4	<1
2028	16	233	102	1	259	260	1	55	56	3	<1	3	1	<1	7	7	<1	1	1	<1
2029	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Thresholds	*54*	*54*	-	*82*	*BMPs*	-	*54*	*BMPs*	-	-	-	-	-	-	-	-	-	-	-	-
	Sacramento Metropolitan Air Quality Management District										Sacramento Metropolitan Air Quality Management District									
	ROG	NO_X	CO	PM10			PM2.5			SO_2	ROG	NO_X	CO	PM10			PM2.5			SO_2
Year				Exhaust	Dust	Total	Exhaust	Dust	Total					Exhaust	Dust	Total	Exhaust	Dust	Total	
2016	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2017	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2018	11	153	69	1	51	52	1	11	12	1	<1	1	2	<1	1	1	<1	<1	<1	<1
2019	35	383	244	3	104	107	3	19	22	2	3	21	21	<1	5	6	<1	1	1	<1
2020	57	562	390	6	138	144	5	23	28	2	6	41	39	<1	10	11	<1	1	2	<1
2021	72	684	500	8	213	221	7	31	39	3	8	61	60	1	15	16	1	2	3	<1
2022	63	556	476	5	130	135	5	23	28	2	8	55	63	1	11	11	1	1	2	<1
2023	57	469	427	4	108	112	4	20	24	2	7	47	57	1	7	8	<1	1	1	<1
2024	54	421	401	4	88	91	3	18	21	2	7	39	50	<1	5	5	<1	1	1	<1
2025	44	346	309	3	76	79	3	16	18	2	4	26	32	<1	4	4	<1	<1	1	<1
2026	33	286	228	2	70	72	2	15	17	2	2	14	16	<1	2	2	<1	<1	<1	<1
2027	13	167	94	1	60	61	1	14	15	1	1	4	5	<1	1	1	<1	<1	<1	<1
2028	4	83	25	<1	34	34	<1	9	9	1	<1	1	<1	<1	<1	<1	<1	<1	<1	<1
2029	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Thresholds	-	*85*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

	Yolo Solano Air Quality Management District										Yolo Solano Air Quality Management District									
	ROG	NO_X	CO	PM10			PM2.5			SO_2	ROG	NO_X	CO	PM10			PM2.5			SO_2
Year				Exhaust	Dust	Total	Exhaust	Dust	Total					Exhaust	Dust	Total	Exhaust	Dust	Total	
2016	0	0	0	0	29	29	0	4	4	0	0	0	0	0	2	2	0	<1	<1	0
2017	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2018	167	1,249	1,206	21	640	662	21	90	111	5	7	56	51	1	32	33	1	4	6	<1
2019	337	2,769	2,111	45	798	830	43	115	155	9	24	196	160	4	64	68	3	10	13	1
2020	239	2,039	1,471	37	489	526	35	79	114	6	28	230	166	4	53	58	4	9	13	1
2021	289	2,405	1,698	40	681	722	38	108	147	8	32	254	184	5	68	72	4	10	15	1
2022	341	2,950	2,105	44	845	889	42	132	174	14	27	219	167	3	81	85	3	12	15	1
2023	396	3,259	2,654	42	1,074	1,111	41	162	197	28	36	280	248	3	104	107	3	14	18	2
2024	417	3,500	2,751	44	1,222	1,265	42	179	221	25	41	314	274	4	125	129	4	18	21	2
2025	372	3,620	2,594	40	1,428	1,467	38	199	237	25	22	162	148	2	79	81	2	11	13	1
2026	212	1,495	1,225	17	608	624	16	102	118	17	18	123	120	2	66	68	2	10	12	1
2027	230	1,780	1,448	42	656	698	41	107	148	26	19	139	123	3	77	80	3	11	14	1
2028	139	992	737	9	471	479	9	75	83	5	7	53	39	<1	29	29	<1	5	5	<1
2029	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Thresholds	-	-	-	-	-	*80*	-	-	-	-	*10*	*10*	-	-	-	-	-	-	-	-

Table 22-49. Criteria Pollutant Emissions from Operation of Alternative 1C (pounds per day and tons per year)

	Maximum Daily Emissions (pounds/day)						Annual Emissions (tons/year)					
	Bay Area Air Quality Management District						Bay Area Air Quality Management District					
Condition	ROG	NO_X	CO	PM10	PM2.5	SO_2	ROG	NO_X	CO	PM10	PM2.5	SO_2
ELT	3	19	32	6	2	<1	0.02	0.15	0.24	0.04	0.01	<0.01
LLT	3	16	31	6	1	<1	0.02	0.13	0.23	0.04	0.01	<0.01
Thresholds	*54*	*54*	-	*82*	*82*	-	-	-	-	-	-	
	Sacramento Metropolitan Air Quality Management District						Sacramento Metropolitan Air Quality Management District					
Condition	ROG	NO_X	CO	PM10	PM2.5	SO_2	ROG	NO_X	CO	PM10	PM2.5	SO_2
ELT	3	19	32	6	2	<1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
LLT	3	16	31	6	1	<1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Thresholds	65	65	-	-	-	-	-	-	-	-	-	-
	Yolo Solano Air Quality Management District						Yolo Solano Air Quality Management District					
Condition	ROG	NO_X	CO	PM10	PM2.5	SO_2	ROG	NO_X	CO	PM10	PM2.5	SO_2
ELT	4	27	51	9	3	<1	0.20	1.21	2.55	0.42	0.12	0.01
LLT	4	23	48	8	2	<1	0.17	1.03	2.43	0.40	0.11	0.01
Thresholds	-	-	-	*80*	-	-	*10*	*10*	-	-	-	-

Impact AQ-1: Generation of Criteria Pollutants in Excess of the SMAQMD Regional Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: As shown in Table 22-48, construction emissions would exceed SMAQMD's daily NO_X threshold for all years between 2018 and 2027, even with implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*). All other pollutants would be below air district thresholds and therefore would not result in an adverse regional air quality effect. Since NO_X is a precursor to ozone and PM, exceedances of SMAQMD's daily NO_X threshold could impact both regional ozone and PM formation, which could worsen regional air quality and air basin attainment of the NAAQS and CAAQS.

While equipment could operate at any work area identified for this alternative, the highest level of NO_X emissions in the SMAQMD is expected to occur at those sites where the duration and intensity of construction activities would be greatest. This includes all intake and intake pumping plant sites along the west bank of the Sacramento River, as well as the intermediate pumping plant site on Ryer Island.

Environmental commitments will reduce construction-related emissions; however, as shown in Table 22-48, NO_X emissions would still exceed SMAQMD's threshold identified in Table 22-8 and would result in an adverse effect to air quality. Mitigation Measures AQ-1a and AQ-1b would be available to reduce NO_X, and would thus address regional effects related to secondary ozone and PM formation.

***CEQA Conclusion*:** NO_X emissions generated during construction would exceed SMAQMD's threshold identified in Table 22-8. Since NO_X is a precursor to ozone and PM, exceedances of SMAQMD's daily NO_X threshold could impact both regional ozone and PM formation.

SMAQMD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS or NAAQS. The impact of generating NO_X emissions in excess of local air district thresholds would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. This impact would therefore be significant. This would be a significant impact. Mitigation Measures AQ-1a and AQ-1b would be available to reduce NO_X emissions to a less-than-significant level by offsetting emissions to quantities below SMAQMD CEQA thresholds (see Table 22-8).

Mitigation Measure AQ-1a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-1a under Impact AQ-1 in the discussion of Alternative 1A.

Mitigation Measure AQ-1b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-1b under Impact AQ-1 in the discussion of Alternative 1A.

Impact AQ-2: Generation of Criteria Pollutants in Excess of the YSAQMD Regional Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: As shown in Table 22-48, construction emissions would exceed YSAQMD regional thresholds for the following pollutants and years, even with implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*). All other pollutants would be below air district thresholds and therefore would not result in an adverse air quality effect.

- ROG: 2019–2027
- NO_X: 2018–2028
- PM10: 2018–2028

Since ROG and NO_X are precursors to ozone and NO_X is a precursor to PM, exceedances of YSAQMD's ROG and NO_X thresholds could impact both regional ozone and PM formation, which could worsen regional air quality and air basin attainment of the NAAQS and CAAQS. Similarly, exceedances of YSAQMD's PM10 threshold could impede attainment of the NAAQS and CAAQS for PM10.

Environmental commitments outlined in Appendix 3B, *Environmental Commitments,* will reduce construction-related emissions; however, as shown in Table 22-48, ROG, NO_X, and PM10 emissions would still exceed the applicable YSAQMD thresholds identified in Table 22-8 and result in an adverse regional effect to air quality. Mitigation Measures AQ-1a and AQ-1b are available to reduce ROG, NO_X, and PM10 emissions, and would thus address regional effects related to secondary ozone and PM formation.

***CEQA Conclusion*:** Emissions of ROG, NO_X, and PM10 generated during construction would exceed YSAQMD's regional thresholds identified in Table 22-8. Since ROG and NO_X are precursors to ozone and NO_X is a precursor to PM, exceedances of YSAQMD's ROG and NO_X threshold could impact both regional ozone and PM formation, which could worsen regional air quality and air basin attainment of the NAAQS and CAAQS. Similarly, exceedances of YSAQMD's PM10 threshold could impede attainment of the NAAQS and CAAQS for PM10. YSAQMD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS or NAAQS. The impact of generating ROG, NO_X, and PM10 in excess of local air district regional thresholds would therefore violate applicable air quality standards in the study area and could contribute to or worsen an existing air quality conditions. This would be a significant impact. Mitigation Measures AQ-1a and AQ-1b would be available to reduce ROG, NO_X, and PM10 emissions to a less-than-significant level by offsetting emissions to quantities below YSAQMD CEQA thresholds (see Table 22-8).

Mitigation Measure AQ-1a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-1a under Impact AQ-1 in the discussion of Alternative 1A.

Mitigation Measure AQ-1b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-1b under Impact AQ-1 in the discussion of Alternative 1A.

Impact AQ-3: Generation of Criteria Pollutants in Excess of the BAAQMD Regional Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: As shown in Table 22-48, construction emissions would exceed BAAQMD's daily thresholds for the following years and pollutants, even with implementation of environmental commitments. All other pollutants would be below air district thresholds and therefore would not result in an adverse air quality effect.

- ROG: 2018–2027
- NO_X: 2018–2028

Since ROG and NO_X are precursors to ozone and NO_X is a precursor to PM, exceedances of BAAQMD's ROG and NO_X thresholds could impact both regional ozone and PM formation, which could worsen regional air quality and air basin attainment of the NAAQS and CAAQS.

While equipment could operate at any work area identified for this alternative, the highest level of ROG and NO_X emissions in the BAAQMD are expected to occur at those sites where the duration and intensity of construction activities would be greatest, including the site of the Byron Tract Forebay adjacent to and northwest of Clifton Court Forebay.

Environmental commitments outlined in Appendix 3B, *Environmental Commitments,* will reduce construction-related emissions; however, as shown in Table 22-48, ROG and NO_X emissions would still exceed BAAQMD's thresholds identified in Table 22-8 and would result in an adverse effect to air quality. Although Mitigation Measures AQ-3a and AQ-3b would be available to reduce ROG and

NO_X, given the magnitude of estimated emissions, neither measure would reduce emissions below district thresholds.[29] Accordingly, this effect would be adverse.

***CEQA Conclusion*:** Emissions of ROG and NO_X precursors generated during construction would exceed BAAQMD thresholds identified in Table 22-8. Since ROG and NO_X are precursors to ozone and NO_X is a precursor to PM, exceedances of BAAQMD's ROG and NO_X thresholds could impact both regional ozone and PM formation. The BAAQMD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS or NAAQS. The impact of generating ROG and NO_X emissions in excess of local air district regional thresholds would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Although Mitigation Measures AQ-3a and AQ-3b would be available to reduce ROG and NO_X, given the magnitude of estimated emissions, neither measure would reduce emissions below district thresholds. Accordingly, this effect would be significant and unavoidable.

Mitigation Measure AQ-3a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within BAAQMD/SFBAAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable BAAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-3a under Impact AQ-3 in the discussion of Alternative 1A.

Mitigation Measure AQ-3b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the BAAQMD/SFBAAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable BAAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-3b under Impact AQ-3 in the discussion of Alternative 1A.

Impact AQ-4: Generation of Criteria Pollutants in Excess of the SJVAPCD Regional Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: Construction of Alternative 1C would occur in the SMAQMD, YSAQMD, and BAAQMD. No construction emissions would be generated in the SJVAPCD. Consequently, construction of Alternative 1C would neither exceed the SJVAPCD regional thresholds of significance nor result in an adverse effect on air quality.

***CEQA Conclusion*:** Construction emissions generated by the alternative would not exceed SJVAPCD's regional thresholds of significance. This impact would be less than significant. No mitigation is required.

[29] The amount of moneys required to achieve sufficient contracts to reduce project emissions below air district thresholds would require immediate and substantial outreach, staffing, and other resources. There are also a number of hurdles related to accelerating equipment turnover and identifying available projects. While the mitigation measure will reduce project emissions, it is unlikely sufficient resources can be identified to reduce emissions by the amount required to achieve a less-than-significant finding.

Impact AQ-5: Generation of Criteria Pollutants in Excess of the SMAQMD Regional Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance in SMAQMD could include annual inspections (see Appendix 22A, *Air Quality Analysis Methodology,* for additional detail). The highest concentration of operational emissions in the SMAQMD would occur at routine inspection sites along the west canal alignment. As shown in Table 22-49, operation and maintenance activities under Alternative 1C would not exceed SMAQMD's regional thresholds of significance and there would be no adverse effect (see Table 22-8). Accordingly, project operations would not contribute to or worsen existing air quality exceedances. There would be no adverse effect.

***CEQA Conclusion*:** Emissions generated during operation and maintenance activities would not exceed SMAQMD regional thresholds for criteria pollutants. SMAQMD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Because project operations would not exceed SMAQMD regional thresholds, the impact would be less than significant. No mitigation is required.

Impact AQ-6: Generation of Criteria Pollutants in Excess of the YSAQMD Regional Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance in YSAQMD could include both routine activities and yearly maintenance. Daily activities at all pumping plants and intakes are covered by maintenance, management, repair, and operating crews. Yearly maintenance would include annual inspections, as well as tunnel dewatering and sediment removal (see Appendix 22A, *Air Quality Analysis Methodology,* for additional detail). The highest concentration of operational emissions in the YSAQMD is expected at intake and intake pumping plant sites along the west bank of the Sacramento River, as well as at the intermediate pumping plant site on Ryer Island. As shown in Table 22-49, operation and maintenance activities under Alternative 1C would not exceed YSAQMD's regional thresholds of significance and there would be no adverse effect (see Table 22-8). Accordingly, project operations would not contribute to or worsen existing air quality exceedances. There would be no adverse effect.

***CEQA Conclusion*:** Emissions generated during operation and maintenance activities would not exceed YSAQMD regional thresholds for criteria pollutants. YSAQMD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS. Projects that do not violate YSAQMD regional thresholds will therefore not conflict with local, state, and federal efforts to improve regional air quality in the SFNA. The impact would be less than significant. No mitigation is required.

Impact AQ-7: Generation of Criteria Pollutants in Excess of the BAAQMD Regional Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance in BAAQMD could include annual inspections, as well as tunnel dewatering and sediment removal (see Appendix 22A, *Air Quality Analysis Methodology,* for additional detail). The highest concentration of operational emissions in the BAAQMD are expected at the Byron Tract Forebay (including control gates), which is adjacent to and northwest of Clifton Court Forebay. As shown in Table 22-49, operation and maintenance activities under Alternative 1C would not exceed BAAQMD's regional thresholds of significance (see Table 22-8). Thus, project operations would not contribute to or worsen existing air quality exceedances. There would be no adverse effect.

***CEQA Conclusion*:** Emissions generated during operation and maintenance activities would not exceed BAAQMD regional thresholds for criteria pollutants. BAAQMD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district thresholds would violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Because project operations would not exceed BAAQMD regional thresholds, the impact would be less than significant. No mitigation is required.

Impact AQ-8: Generation of Criteria Pollutants in Excess of the SJVAPCD Regional Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Alternative 1C would not construct any permanent features in the SJVAPCD that would require routine operations and maintenance. No operational emissions would be generated in the SJVAPCD. Consequently, operation of Alternative 1C would neither exceed the SJVAPCD thresholds of significance nor result in an adverse effect to air quality.

***CEQA Conclusion*:** Alternative 1C would not construct any permanent features in the SJVAPCD that would require routine operations and maintenance. No operational emissions would be generated in the SJVAPCD. Consequently, operation of Alternative 1C would not contribute to or worsen existing air quality conditions in the SJVAPCD. This impact would be less than significant. No mitigation is required.

Impact AQ-9: Exposure of Sensitive Receptors to Health Hazards from Localized Particulate Matter in Excess of SMAQMD's Health-Based Concentration Thresholds

NEPA Effects: As shown in Table 22-48, construction would increase PM10 and PM2.5 emissions in SMAQMD, which may pose inhalation-related health risks for receptors exposed to certain concentrations.

PM2.5 and PM10 concentrations at sensitive receptors locations were assessed using the EPA's AERMOD dispersion. The methodology described in Section 22.3.1.3 provides a more detailed summary of the approach used to conduct the analysis. Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, provides an in-depth discussion of the methodology and results.

Table 22-50 shows the highest predicted annual and daily (24-hour) PM10 and PM2.5 concentrations in SMAQMD. Exceedances of air district thresholds are shown in underline.

Table 22-50. Alternative 1C PM10 and PM2.5 Concentration Results in SMAQMD

	PM10		PM2.5	
Parameter	Annual (μg/m³)	24-Hour (μg/m³)	Annual (μg/m³)	24-Hour (μg/m³)
Maximum Value	0.13	6.7	0.02	1.13
SMAQMD Threshold	*1*	*2.5*	*0.6*	-

Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions,* includes modeling results for all receptors.
μg/m³ = micrograms per cubic meter

All estimated annual PM10 and PM2.5 concentrations would be less than SMAQMD's annual thresholds. However, as shown in Table 22-50, the maximum predicted 24-hour PM10 concentration exceeds SMAQMD's threshold of 2.5 μg/m³. Exceedances of the threshold would occur at 287 receptor locations near intakes and intake work areas. The exceedances would be temporary and occur intermittently due to soil disturbance during construction activities

As discussed above, DWR has identified several environmental commitments to reduce construction-related particulate matter in the SMAQMD (see Appendix 3B, *Environmental Commitments*). While these commitments will reduce localized particulate matter emissions, concentrations at the analyzed receptor locations would still exceed SMAQMD's 24-hour PM10 threshold. The receptors exposed to PM10 concentrations in excess of SMAQMD's threshold could experience increased risk for adverse human health effects. Mitigation Measure AQ-9 is available to address this effect.

CEQA Conclusion: Respirable particulates pose a human health hazard by bypassing the defenses within the mucous ciliary system and entering deep lung tissue. Construction of Alternative 1C would result in PM10 concentrations at 287 receptor locations that are above the 24-hour significance threshold established by the SMAQMD. As such, localized particulate matter concentrations at analyzed receptors would result in significant human health impacts. Mitigation Measure AQ-9 outlines a tiered strategy to reduce PM10 concentrations and public exposure to a less-than-significant level.

Mitigation Measure AQ-9: Implement Measures to Reduce Re-Entrained Road Dust and Receptor Exposure to PM2.5 and PM10

Please see Mitigation Measure AQ-9 under Impact AQ-9 in the discussion of Alternative 1A.

Impact AQ-10: Exposure of Sensitive Receptors to Health Hazards from Localized Particulate Matter in Excess of YSAQMD's Health-Based Concentration Thresholds

NEPA Effects: As shown in Table 22-48, construction would increase PM10 and PM2.5 emissions in YSAQMD, which may pose inhalation-related health risks for receptors exposed to certain concentrations.

PM2.5 and PM10 concentrations at sensitive receptors locations were assessed using the EPA's AERMOD dispersion. The methodology described in Section 22.3.1.3 provides a more detailed summary of the approach used to conduct the analysis. Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, provides an in-depth discussion of the methodology and results.

As shown in Table 22-51, the maximum predicted PM2.5 and PM10 concentrations are less than YSAQMD's adopted thresholds. The project would also implement all air district recommended onsite fugitive dust controls, such as regular watering. Accordingly, this alternative's effect of exposure of sensitive receptors to localized particulate matter concentrations would not be adverse.

Table 22-51. Alternative 1C PM10 and PM2.5 Concentration Results in YSAQMD

	PM10		PM2.5	
Parameter	Annual (μg/m³)	24-Hour (μg/m³)	Annual (μg/m³)	24-Hour (μg/m³)
Maximum Value	0.55	8.7	0.08	1.4
YSAQMD Threshold	*20*	*50*	*12*	*35*

Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions,* includes modeling results for all receptors.
μg/m³ = micrograms per cubic meter

CEQA Conclusion: Respirable particulates pose human health hazard by bypassing the defenses within the mucous ciliary system and entering deep lung tissue. Construction of Alternative 1C would result in PM2.5 and PM10 concentrations at receptor locations that are below the significance thresholds adopted by the YSAQMD. As such, localized particulate matter concentrations at analyzed receptors would not result in significant human health impacts. No mitigation is required.

Impact AQ-11: Exposure of Sensitive Receptors to Health Hazards from Localized Particulate Matter in Excess of BAAQMD's Health-Based Concentration Thresholds

NEPA Effects: As shown in Table 22-48, construction would increase PM10 and PM2.5 emissions in BAAQMD, which may pose inhalation-related health risks for receptors exposed to certain concentrations.

PM2.5 and PM10 concentrations at sensitive receptors locations were assessed using the EPA's AERMOD dispersion. The methodology described in Section 22.3.1.3 provides a more detailed summary of the approach used to conduct the analysis. Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, provides an in-depth discussion of the methodology and results.

As shown in Table 22-52, maximum predicted PM2.5 concentrations are less than the significance threshold set by the BAAQMD. The project would also implement all air district recommended onsite fugitive dust controls, such as regular watering. Accordingly, this alternative's effect of exposure of sensitive receptors to localized particulate matter concentrations would not be adverse.

Table 22-52. Alternative 1C PM10 and PM2.5 Concentration Results in BAAQMD

	PM10		PM2.5	
Parameter	Annual (μg/m³)	24-Hour (μg/m³)	Annual (μg/m³)	24-Hour (μg/m³)
Maximum Value	1.1	108	0.2	19
BAAQMD Threshold	-	-	*0.3*	-

Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions,* includes modeling results for all receptors.
μg/m³ = micrograms per cubic meter

***CEQA Conclusion*:** Respirable particulates pose human health hazard by bypassing the defenses within the mucous ciliary system and entering deep lung tissue. Construction of Alternative 1C would result in PM2.5 concentrations at receptor locations that are below the significance thresholds established by the BAAQMD. As such, localized particulate matter concentrations at analyzed receptors would not result in significant human health impacts. No mitigation is required.

Impact AQ-12: Exposure of Sensitive Receptors to Health Hazards from Localized Particulate Matter in Excess of SJVAPCD's Health-Based Concentration Thresholds

NEPA Effects: Construction of Alternative 1C would occur in the SMAQMD, YSAQMD, and BAAQMD. No construction emissions would be generated in the SJVAPCD. Consequently, Alternative 1C would not expose receptors to increased health risks from localized particulate matter since there would be no emissions. There would be no adverse effect.

***CEQA Conclusion*:** Construction of Alternative 1C would occur in the SMAQMD, YSAQMD, and BAAQMD. No construction emissions would be generated in the SJVAPCD. Consequently, Alternative 1C would not expose receptors to increased health risks from localized particulate matter since there would be no emissions. This impact would be less than significant. No mitigation is required.

Impact AQ-13: Exposure of Sensitive Receptors to Health Hazards from Localized Carbon Monoxide

Continuous engine exhaust may elevate localized CO concentrations. Receptors exposed to these CO "hot-spots" may have a greater likelihood of developing adverse health effects (as described in Section 22.1.2). CO hot-spots are typically observed at heavily congested intersections where a substantial number of gasoline-powered vehicles idle for prolonged durations throughout the day. Construction sites are less likely to result in localized CO hot-spots due to the nature of construction activities (Sacramento Metropolitan Air Quality Management District 2014), which normally utilize diesel-powered equipment for intermittent or short durations. Moreover, construction sites must comply with the Occupational Safety and Health Administration's (OSHA) CO exposure standards for onsite workers. Unlike regional pollutants (e.g., ROG and NO_X), CO concentrations also dissipate as a function of distance and will therefore be lower at offsite receptor locations. Accordingly, given that construction activities typically do not result in CO hot-spots, onsite concentrations must comply with OSHA standards, and CO levels dissipate as a function of distance, equipment-generated CO emissions (see Table 22-48) are not anticipated to result in adverse health hazards to sensitive receptors.

Construction traffic may contribute to increased roadway congestion, which could lead to conditions conducive to CO hot-spot formation. As shown in Table 19-25, the highest peak hour traffic volumes under BPBGPP—11,863 vehicles per hour—would occur on westbound Interstate 80 between Suisun Valley Road and State Route 12. This is about half of the congested traffic volume modeled by BAAQMD (24,000 vehicles per hour) that would be needed to contribute to a localized CO hot-spot, and less than half of the traffic volume modeled by SMAQMD (31,600 vehicles per hour). The BAAQMD's and SMAQMD's CO screening criteria were developed based on County average vehicle fleets that are primarily comprised of gasoline vehicles. Construction vehicles would be predominantly diesel trucks, which generate fewer CO emissions per idle-hour and vehicle mile traveled than gasoline-powered vehicles. Accordingly, the air district screening thresholds provide a conservative evaluation threshold for the assessment of potential CO emissions impacts during construction.

Based on the above analysis, even if all 11,863 vehicles on the modeled traffic segment drove through the same intersection in the peak hour, CO concentrations adjacent to the traveled way would not exceed the CAAQS or NAAQS according to BAAQMD's and SMAQMD's screening criteria. Thus, construction traffic is not anticipated to result in adverse health hazards to sensitive receptors.

***CEQA Conclusion*:** Continuous engine exhaust may elevate localized CO concentrations. Receptors exposed to these CO "hot-spots" may have a greater likelihood of developing adverse health effects. Construction sites are less likely to result in localized CO hot-spots due to the nature of construction activities (Sacramento Metropolitan Air Quality Management District 2014), which normally utilize diesel-powered equipment for intermittent or short durations. Moreover, construction sites must comply with the OSHA CO exposure standards for onsite workers. Accordingly, given that construction activities typically do not result in CO hot-spots, onsite concentrations must comply with OSHA standards, and CO levels dissipate as a function of distance, equipment-generated CO emissions are not anticipated to result in significant health hazards to sensitive receptors. Similarly, peak-hour construction traffic on local roadways would not exceed BAAQMD's or SMAQMD's conservative screening criteria for the formation potential CO hot-spots. This impact would be less than significant. No mitigation is required.

Impact AQ-14: Exposure of Sensitive Receptors to Health Hazards from Diesel Particulate Matter in Excess of SMAQMD's Chronic Non-Cancer and Cancer Risk Thresholds

NEPA Effects: As shown in Table 22-48, construction of Alternative 1C would increase DPM emissions in SMAQMD, which poses inhalation-related chronic non-cancer hazard and cancer risks if adjacent receptors are exposed to significant DPM concentrations for prolonged durations.

Receptor exposure to construction DPM emissions was assessed by predicting the health risks in terms of excess cancer and non-cancer hazard impacts using the EPA's AERMOD dispersion modeling and guidance published by OEHHA. Based on HRA results detailed in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, Alternative 1C would not exceed the SMAQMD's chronic non-cancer or cancer thresholds (Table 22-53) and, thus, would not expose sensitive receptors to substantial pollutant concentrations. This alternative's effect of exposure of sensitive receptors to DPM emissions and their health hazards during construction would not be adverse.

***CEQA Conclusion*:** DPM generated during construction poses inhalation-related chronic non-cancer hazard and cancer risk if adjacent receptors are exposed to significant concentrations for prolonged durations. The DPM generated during Alternative 1C construction would not exceed the SMAQMD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this impact for DPM emissions would be less than significant. No mitigation is required.

Table 22-53. Alternative 1C Health Hazards from DPM Exposure in the Sacramento Metropolitan Air Quality Management District

Parameter	Chronic Health Hazard	Cancer Health Risk
Maximum Value at MEI	0.001	3 per million
Thresholds	1	10 per million

Source: Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*.
MEI = maximally exposed individual.

Impact AQ-15: Exposure of Sensitive Receptors to Health Hazards from Diesel Particulate Matter in Excess of YSAQMD's Chronic Non-Cancer and Cancer Risk Thresholds

NEPA Effects: As shown in Table 22-48, construction of Alternative 1C would increase DPM emissions in YSAQMD, which poses inhalation-related chronic non-cancer hazard and cancer risks if adjacent receptors are exposed to significant DPM concentrations for prolonged durations.

Receptor exposure to construction DPM emissions was assessed by predicting the health risks in terms of excess cancer and non-cancer hazard impacts using the EPA's AERMOD dispersion modeling and guidance published by OEHHA. Based on HRA results detailed in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions,* Alternative 1C would not exceed the YSAQMD's chronic non-cancer or cancer thresholds (Table 22-54) and, thus, would not expose sensitive receptors to substantial pollutant concentrations. This alternative's effect of exposure of sensitive receptors to DPM emissions and their health hazards during construction would not be adverse.

***CEQA Conclusion*:** DPM generated during construction poses inhalation-related chronic non-cancer hazard and cancer risk if adjacent receptors are exposed to significant concentrations for prolonged durations. The DPM generated during Alternative 1C construction would not exceed the YSAQMD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this impact for DPM emissions would be less than significant. No mitigation is required.

Table 22-54. Alternative 1C Health Hazards from DPM Exposure in the Yolo-Solano Air Quality Management District

Parameter	Chronic Health Hazard	Cancer Health Risk
Maximum Value	0.003	9 per million
YSAQMD Thresholds	*1*	*10 per million*

Source: Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*
Note: Emissions would not be generated in Yolo County. However, emissions from the adjacent Sacramento County could affect sensitive receptors in Yolo County.

Impact AQ-16: Exposure of Sensitive Receptors to Health Hazards from Diesel Particulate Matter in Excess of BAAQMD's Chronic Non-Cancer and Cancer Risk Thresholds

NEPA Effects: As shown in Table 22-48, construction would increase DPM emissions in the BAAQMD, particularly near sites involving the greatest duration and intensity of construction activities. DPM poses inhalation-related chronic non-cancer hazard and cancer risks if adjacent receptors are exposed to significant DPM concentrations for prolonged durations.

Receptor exposure to construction DPM emissions was assessed by predicting the health risks in terms of excess cancer and non-cancer hazard impacts using the EPA's AERMOD dispersion modeling and guidance published by OEHHA. Based on the HRA results detailed in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, Alternative 1C would not exceed the BAAQMD's chronic non-cancer hazard thresholds (see Table 22-55) and, thus, would not expose sensitive receptors to substantial pollutant concentrations from chronic exposure to DPM. However, 186 receptor locations were found to exceed the BAAQMD's significance threshold for cancer risk. These exceedances are primarily due to exhaust generated by the development of the bridge, canals and spoil areas. The high number of exceedances is due to the proximity of a large track home development.

As discussed above, DWR has identified several environmental commitments to reduce construction-related diesel particulate matter in the BAAQMD (see Appendix 3B, Environmental Commitments). While these commitments will reduce localized diesel particulate matter emissions, cancer risk levels were found to exceed the significance threshold at some of the analyzed receptors and those locations could experience increased risk for adverse human health effects. Therefore, this alternative's effect of exposure of sensitive receptors to DPM emissions health effects during construction would be adverse.

Mitigation Measure AQ-16 would be available to reduce exposure to substantial cancer risk by relocating affected receptors. Although Mitigation Measure AQ-16 would reduce the severity of this effect, the BDCP proponents are not solely responsible for implementation of the measure. If a landowner chooses not to accept DWR's offer of relocation assistance, an adverse effect in the form excess cancer risk above air district thresholds would occur. Therefore, this effect would be adverse. If, however, all landowners accept DWR's offer of relocation assistance, effects would not be adverse.

CEQA Conclusion**:** DPM generated during construction poses inhalation-related chronic non-cancer hazard and cancer risk if adjacent receptors are exposed to significant concentrations for prolonged durations. The DPM generated during Alternative 1C construction would not exceed the BAAQMD's chronic non-cancer hazard and thus would not expose sensitive receptors to substantial health hazards for chronic exposure of DPM. However, the project emissions would result in exceedances of the BAAQMD's cancer risk threshold. Therefore, this impact for DPM emissions would be significant.

Mitigation Measure AQ-16 would be available to reduce exposure to substantial cancer risk by relocating affected receptors. Although Mitigation Measure AQ-16 would reduce the severity of this effect, the BDCP proponents are not solely responsible for implementation of the measure. If a landowner chooses not to accept DWR's offer of relocation assistance, a significant impact in the form excess cancer risk above air district thresholds would occur. Therefore, this effect would be significant and unavoidable. If, however, all landowners accept DWR's offer of relocation assistance, the impact would be less than significant.

Mitigation Measure AQ-16: Relocate Sensitive Receptors to Avoid Excess Cancer Risk

Please see Mitigation Measure AQ-16 under Impact AQ-16 in the discussion of Alternative 1A.

Table 22-55. Alternative 1C Health Hazards from DPM Exposure in the Bay Area Air Quality Management District

Alternative 1C	Chronic Health Hazard	Cancer Health Risk
Maximum Value	0.006	18 per million
BAAQMD Thresholds	*1*	*10 per million*
Source: Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*.		

Impact AQ-17: Exposure of Sensitive Receptors to Health Hazards from Diesel Particulate Matter in Excess of SJVAPCD's Chronic Non-Cancer and Cancer Risk Thresholds

NEPA Effects: Construction of Alternative 1C would occur in the SMAQMD, YSAQMD, and BAAQMD. No construction emissions would be generated in the SJVAPCD. Consequently, Alternative 1C would not expose receptors to increased health risks from localized particulate matter since there would be no emissions. There would be no adverse effect.

***CEQA Conclusion*:** Construction of Alternative 1C would occur in the SMAQMD, YSAQMD, and BAAQMD. No construction emissions would be generated in the SJVAPCD. Consequently, Alternative 1C would not expose receptors to increased health risks from localized particulate matter since there would be no emissions. This impact would be less than significant. No mitigation is required..

..

Impact AQ-18: Exposure of Sensitive Receptors to *Coccidioides immitis* (Valley Fever)

***NEPA Effects*:** As discussed under Alternative 1A, earthmoving activities during construction could release *C. immitis* spores if filaments are present and other soil chemistry and climatic conditions are conducive to spore development. Receptors adjacent to the construction area may therefore be exposed to increase risk of inhaling *C. immitis* spores and subsequent development of Valley Fever. Dust-control measures are the primary defense against infection (United States Geological Survey 2000). Implementation of advanced air-district recommended fugitive dust controls outlined in Appendix 3B, *Environmental Commitments*, would avoid dusty conditions and reduce the risk of contracting Valley Fever through routine watering and other controls. Therefore, this alternative's effect of exposure of sensitive receptors to increased Valley Fever risk during construction would not be adverse.

***CEQA Conclusion*:** Construction of the water conveyance facility would involve earthmoving activities that could release *C. immitis* spores if filaments are present and other soil chemistry and climatic conditions are conducive to spore development. Receptors adjacent to the construction area may therefore be exposed to increase risk of inhaling *C. immitis* spores and subsequent development of Valley Fever. Implementation of air-district recommended fugitive dust controls outlined in Appendix 3B, *Environmental Commitments*, would avoid dusty conditions and reduce the risk of contracting Valley Fever through routine watering and other controls. Therefore, this impact would be less than significant. No mitigation is required.

Impact AQ-19: Creation of Potential Odors Affecting a Substantial Number of People during Construction or Operation of the Proposed Water Conveyance Facility

NEPA Effects: As discussed under Alternative 1A, odors from construction activities would be localized and generally confined to the immediate area surrounding the construction site. Moreover, odors would be temporary and localized, and they would cease once construction activities have been completed. Thus, it is not anticipated that construction of CM1 would create objectionable odors from construction equipment or asphalt paving.

Construction of the water conveyance facility would require removal of subsurface material during tunnel excavation and sediment removal. As discussed under Alternative 1A, geotechnical tests indicate that VOC levels in Plan Area soils are below the method detection limits, indicating that organic decay of exposed RTM and sediment will be relatively low (URS 2014). Moreover, drying and stockpiling of the removed RTM and sediment will occur under aerobic conditions, which will further limit any potential decomposition and associated malodorous products. Accordingly, it is not anticipated that tunnel and sediment excavation would create objectionable odors.

Typical facilities known to produce odors include landfills, wastewater treatment plants, food processing facilities, and certain agricultural activities. Alternative 1C would not result in the addition of facilities associated with odors, and as such, long-term operation of the water conveyance facility would not result in objectionable odors.

CEQA Conclusion**:** Alternative 1C would not result in the addition of major odor producing facilities. Diesel emissions during construction could generate temporary odors, but these would quickly dissipate and cease once construction is completed. Likewise, potential odors generated during asphalt paving would be addressed through mandatory compliance with air district rules and regulations. While tunnel excavation would unearth substantial quantities of RTM, geotechnical tests indicate that soils in the Plan Area have relatively low organic constituents. Moreover, drying and stockpiling of the removed RTM will occur under aerobic conditions, which will further limit any potential decomposition and associated malodorous products. Accordingly, the impact of exposure of sensitive receptors to potential odors would be less than significant. No mitigation is required.

Impact AQ-20: Generation of Criteria Pollutants in the Excess of Federal *De Minimis* Thresholds from Construction and Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: EPA's General Conformity Rule (40 CFR Parts 51 and 93) only applies to Federal actions that are taken in EPA-designated "nonattainment" or "maintenance" areas. Accordingly, as outlined in Section III.A of the General Conformity Rule, "only actions which cause emissions in designated nonattainment and maintenance areas are subject to the regulations". Criteria pollutant emissions resulting from construction and operation of Alternative 1C in the SFNA and SFBAAB are presented in Table 22-56 (no emissions would be generated in the SJVAB). Exceedances of the federal *de minimis* thresholds are shown in <u>underlined</u> text.

Sacramento Federal Nonattainment Area

As shown in Table 22-56, implementation of Alternative 1C would exceed the following SFNA federal *de minimis* thresholds:

- ROG: 2019–2025

- NO_X: 2018–2028

ROG and NO_X are precursors to ozone and NO_X is a precursor to PM, for which the SFNA is in nonattainment for the NAAQS. Since project emissions exceed the federal *de minimis* thresholds for ROG and NO_X, a general conformity determination must be made to demonstrate that total direct and indirect emissions of ROG and NO_X would conform to the appropriate SFNA SIP for each year of construction in which the *de minimis* thresholds are exceeded.

NO_X is also a precursor to PM and can contribute to PM formation. As discussed above, Sacramento County is currently designated maintenance for the PM10 NAAQS and portions of the SVAB are designated nonattainment for the PM2.5 NAAQS. NO_X emissions in excess of 100 tons per year in Sacramento County trigger a secondary PM10 precursor threshold, whereas NO_X emissions in excess of 100 tons per year in the SVAB trigger a secondary PM2.5 precursor threshold. Since NO_X emissions can contribute to PM formation, NO_X emissions in excess of these secondary precursor thresholds could conflict with the applicable PM10 and PM2.5 SIPs. Accordingly, NO_X offsets pursued for the purposes of general conformity for those years in which NO_X emissions exceed 100 tons must occur within the federally designated PM2.5 nonattainment and PM10 maintenance areas of the SVAB.

As shown in Table 22-48, NO_X emissions generated by construction activities in SMAQMD (Sacramento County) would not exceed 100 tons per year. Accordingly, the project does not trigger the secondary PM10 precursor threshold. As shown in Table 22-56, NO_X emissions in 2019 through 2027 would exceed 100 tons year in the SFNA. The project therefore triggers the secondary PM2.5 precursor threshold, requiring all NO_X offsets for 2019 through 2027 to occur within the federally designated PM2.5 nonattainment area within the SFNA. The nonattainment boundary for PM2.5 includes all of Sacramento County and portions of Yolo, El Dorado, Solano, and Placer counties.

The federal lead agencies (Reclamation, USFWS, and NMFS) demonstrate that project emissions would not result in a net increase in regional NO_X emissions, as construction-related NO_X would be fully offset to zero through implementation of Mitigation Measures AQ-1a and 1b, which require additional onsite mitigation and/or offsets. Mitigation Measures AQ-1a and 1b will ensure the requirements of the mitigation and offset program are implemented and conformity requirements for NO_X are met.

Mitigation Measure AQ-1a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-1a under Impact AQ-1 in the discussion of Alternative 1A.

Mitigation Measure AQ-1b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-1b under Impact AQ-1 in the discussion of Alternative 1A.

Table 22-56. Criteria Pollutant Emissions from Construction and Operation of Alternative 1C in Nonattainment and Maintenance Areas of the SFNA and SFBAAB (tons/year)

Year	Sacramento Federal Nonattainment Area					
	ROG	NO_X[a]	CO[b]	PM10[c]	PM2.5	SO_2
2016	0	0	0	0	0	0
2017	0	0	0	0	0	0
2018	8	58	<1	1	6	<1
2019	27	217[d]	0	6	14	1
2020	33	271[d]	0	11	14	1
2021	40	316[d]	1	16	17	1
2022	35	274[d]	5	11	17	1
2023	43	327[d]	5	8	19	2
2024	48	353[d]	5	5	22	2
2025	26	188[d]	4	4	14	1
2026	20	137[d]	3	2	12	1
2027	19	144[d]	4	1	15	1
2028	7	53	4	0	5	<1
2029	0	0	0	0	0	0
ELT	0.20	1.21	2.55	0.42	0.12	0.01
LLT	0.17	1.03	2.43	0.40	0.11	0.01
De Minimis	*25*	*25*	*100*	*100*	*100*	*100*

	San Francisco Bay Area Air Basin					
Year	ROG	NO_X[a]	CO[b]	PM10[e]	PM2.5	SO_2
2016	0	0	0	-	1	0
2017	0	0	0	-	0	0
2018	8	60	1	-	7	<1
2019	27	212	2	-	16	1
2020	21	175	2	-	10	1
2021	25	207	3	-	12	1
2022	20	152	4	-	10	1
2023	20	144	5	-	10	1
2024	23	157	6	-	11	1
2025	10	66	3	-	5	1
2026	7	48	3	-	4	<1
2027	3	27	3	-	4	<1
2028	<1	3	1	-	1	<1
2029	0	0	0	-	0	0
ELT	0.02	0.15	0.24	-	0.01	0.00
LLT	0.02	0.13	0.23	-	0.01	0.00
De Minimis	*100*	*100*	*100*	-	*100*	*100*

Notes

[a] NO_X emissions in excess of 100 tons per year within federally designated PM10 and PM2.5 nonattainment or maintenance areas trigger a secondary PM10 and PM2.5 precursor threshold. NO_X emissions in excess of this secondary threshold could conflict with the applicable PM10 and PM2.5 SIPs. Accordingly, NO_X offsets pursued for the purposes of general conformity for those years in which NO_X emissions exceed 100 tons must occur within the federally designated PM2.5 nonattainment and PM10 maintenance areas, as applicable.

[b] The proposed water conveyance facility is located within a federally designated CO attainment area. Accordingly, CO emissions generated by construction of CM1 are not subject to the General Conformity Rule and are excluded from the emissions summary and general conformity analysis (40 CFR Part 51 and 93, Section III.A). Emissions presented in the table are limited those generated by haul trucks, which would occur in federally designated CO maintenance area.

[c] There are no federally designated PM10 maintenance areas in Yolo County. Accordingly, PM10 emissions generated by construction of CM1 in Yolo County are not subject to the General Conformity Rule and are excluded from the emissions summary and general conformity analysis for the SFNA (40 CFR Part 51 and 93, Section III.A). Emissions presented in the table are limited those generated within Sacramento County.

[d] Refer to Table 22-48 for summary of emissions by air district. Emissions within SMAQMD would not exceed 100 tons.

[e] There are no federally designated PM10 nonattainment or maintenance areas in the SFBAAB. Accordingly, PM10 emissions generated by construction of CM1 are not subject to the General Conformity Rule and are excluded from the emissions summary and general conformity analysis (40 CFR Part 51 and 93, Section III.A).

San Francisco Bay Area Air Basin

As shown in Table 22-56, implementation of Alternative 1C would exceed the following SFBAAB federal *de minimis* thresholds:

- NO_X: 2019–2024

NO_X is a precursor to ozone, for which the SJVAB is in nonattainment for the NAAQS. Since project emissions exceed the federal *de minimis* threshold for NO_X, a general conformity determination must be made to demonstrate that total direct and indirect emissions of NO_X would conform to the appropriate SFBAAB SIP for each year of construction in which the *de minimis* thresholds are exceeded.

NO_X is also a precursor to PM and can contribute to PM formation. As discussed above, the SFBAAB is currently designated nonattainment for the PM2.5 NAAQS. NO_X emissions in excess of 100 tons per year trigger a secondary PM precursor threshold, and could conflict with the applicable PM2.5 SIP. Accordingly, NO_X offsets pursued for the purposes of general conformity for those years in which NO_X emissions exceed 100 tons must occur within the federally designated PM2.5 nonattainment area of the SFBAAB, which is consistent with the larger nonattainment boundary for ozone.

Although Mitigation Measures AQ-3a and AQ-3b would reduce NO_X, given the magnitude of emissions; neither measure could feasibly reduce emissions to net zero. This impact would be adverse. In the event that Alternative 1C is selected as the APA, Reclamation, USFWS, and NMFS would need to demonstrate that conformity is met for NO_X through a local air quality modeling analysis (i.e., dispersion modeling) or other acceptable methods to ensure project emissions do not cause or contribute to any new exceedances of the NAAQS or increase the frequency or severity of any existing exceedances.

Mitigation Measure AQ-3a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the BAAQMD/SFBAAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable BAAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-3a under Impact AQ-3 in the discussion of Alternative 1A.

Mitigation Measure AQ-3b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the BAAQMD/SFBAAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable BAAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-3b under Impact AQ-3 in the discussion of Alternative 1A.

CEQA Conclusion: SFNA and SFBAAB are classified as nonattainment areas with regard to the ozone NAAQS and the impact of increases in criteria pollutant emissions above the air basin *de minimis* thresholds could conflict with or obstruct implementation of the applicable air quality plans. Since construction emissions in the SFNA and SFBAAB would exceed the *de minimis* thresholds for ROG (SFNA only) and NO_X, this impact would be significant.

Mitigation Measures AQ-1a and AQ-1bwould ensure project emissions would not result in an increase in regional ROG or NO_X emissions in the SFNA. These measures would therefore ensure total direct and indirect ROG and NO_X emissions generated by the project in the SFNA would conform to the appropriate air basin SIPs by offsetting the action's emissions in the same or nearby area to net zero.

Although Mitigation Measures AQ-3a and AQ-3b would reduce NO_X in the SFBAAB, given the magnitude of emissions; neither measure could feasibly reduce emissions to net zero. This impact would be significant and unavoidable.

No emissions would be generated within the SJVAB and as such, the project would conform to the appropriate SJVAB SIPs.

Impact AQ-21: Generation of Cumulative Greenhouse Gas Emissions during Construction of the Proposed Water Conveyance Facility

NEPA Effects: GHG (CO_2, CH_4, N_2O, SF_6, and HFCs) emissions resulting from construction of Alternative 1C are presented in Table 22-57. Emissions with are presented with implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*) and state mandates to reduce GHG emissions. State mandates include the RPS, LCFS, and Pavley. These mandates do not require additional action on the part of DWR, but will contribute to GHG emissions reductions. For example, Pavley and LCFS will improve the fuel efficiency of vehicles and reduce the carbon content of transportation fuels, respectively. Equipment used to construct the project will therefore be cleaner and less GHG intensive than if the state mandates had not been established.

Table 22-58 summarizes GHG emissions that would be generated in the BAAQMD, SMAQMD, and YSAQMD (no construction emissions would be generated in the SJVAPCD). The table does not include emissions from electricity generation as these emissions would be generated by power plants located throughout the state and the specific location of electricity-generating facilities is unknown (see discussion preceding this impact analysis). Due to the global nature of GHGs, the determination of effects is based on total emissions generated by construction (Table 22-57). GHG emissions presented in Table 22-58 are therefore provided for information purposes only.

Construction of Alternative 1C would generate a total of 2.5 million metric tons of GHG emissions, after implementation of environmental commitments and state mandates. This is equivalent to adding 518,000 typical passenger vehicles to the road during construction (U.S. Environmental Protection Agency 2014e). As discussed in section 22.3.2, *Determination of Effects*, any increase in emissions above net zero associated with construction of the BDCP water conveyance features would be adverse. Accordingly, this effect would be adverse. Mitigation Measure AQ-21, which would develop a GHG Mitigation Program to reduce construction-related GHG emissions to net zero, is available address this effect.

Table 22-57. GHG Emissions from Construction of Alternative 1C (metric tons/year)[a]

Year	Equipment and Vehicles (CO_2e)	Electricity (CO_2e)	Concrete Batching (CO_2)	Total CO_2e
2016	0	0	499	499
2017	0	0	0	0
2018	42,159	359	62,034	104,552
2019	142,951	2,009	9,744	154,704
2020	130,349	9,650	60,545	200,544
2021	156,016	25,692	120,086	301,794
2022	144,322	36,078	182,008	362,409
2023	169,877	32,117	177,701	379,695
2024	183,293	33,500	212,603	429,396
2025	95,161	22,599	141,966	259,726
2026	74,368	8,068	34,020	116,457
2027	64,634	1,541	49,062	115,237
2028	26,032	41	9,653	35,726
2029	0	1	0	1
Total	*1,229,162*	*171,656*	*1,059,921*	*2,460,738*

[a] Emissions estimates do not account for GHG flux from land disturbance. Surface and subsurface (e.g., tunneling) activities may oxidize peat soils, releasing GHG emissions. However, recent geotechnical surveys indicated that peat is negligible below 80 feet of depth. The tunnel will be placed below this range and the design adjusted if peat soils are discovered. Peat material encountered during surface excavation for non-tunnel work will be covered with top soil to reduce oxidation when needed.

Values may not total correctly due to rounding.

Table 22-58. Total GHG Emissions from Construction of Alternative 1C by Air District (metric tons/year)

Year	Equipment and Vehicles (CO_2e)	Concrete Batching (CO_2)[a]	Total CO_2e[b]
SMAQMD	105,869	0	105,869
YSAQMD	642,905	635,952	1,278,857
BAAQMD	480,388	423,968	904,356

[a] Emissions assigned to each air district based on the number of batching plants located in that air district.
[b] Values may not total correctly due to rounding.

CEQA Conclusion: Construction of Alternative 1C would generate a total of 2.5 million metric tons of GHG emissions. This is equivalent to adding 518,000 typical passenger vehicles to the road during construction (U.S. Environmental Protection Agency 2014e). As discussed in section 22.3.2, *Determination of Effects*, any increase in emissions above net zero associated with construction of the BDCP water conveyance features would be significant. Mitigation Measure AQ-21 would develop a GHG Mitigation Program to reduce construction-related GHG emissions to net zero. Accordingly, this impact would be less-than-significant with implementation of Mitigation Measure AQ-21.

Mitigation Measure AQ-21: Develop and Implement a GHG Mitigation Program to Reduce Construction Related GHG Emissions to Net Zero (0)

Please see Mitigation Measure AQ-21 under Impact AQ-21 in the discussion of Alternative 1A.

Impact AQ-22: Generation of Cumulative Greenhouse Gas Emissions from Operation and Maintenance of the Proposed Water Conveyance Facility and Increased Pumping

NEPA Effects: Operation of Alternative 1C would generate direct and indirect GHG emissions. Sources of direct emissions include heavy-duty equipment, on road crew trucks, and employee vehicle traffic. Indirect emissions would be generated predominantly by electricity consumption required for pumping as well as, maintenance, lighting, and other activities.

Table 22-59 summarizes long-term operational GHG emissions associated with operations, maintenance, and increased SWP pumping. Emissions were quantified for both ELT and LLT conditions, although activities would take place annually until project decommissioning. Emissions include state mandates to reduce GHG emissions (described in Impact AQ-21) are presented (there are no BDCP specific operational environmental commitments). Total CO_2e emissions are compared to both the No Action Alternative (NEPA point of comparison) and Existing Conditions (CEQA baseline). As discussed in Section 22.3.1.2, equipment emissions are assumed to be zero under both the No Action Alternative (NEPA point of comparison) and Existing Conditions (CEQA baseline). The equipment emissions presented in Table 22-59 are therefore representative of project impacts for both the NEPA and CEQA analysis.

Table 22-59. GHG Emissions from Operation, Maintenance, and Increased Pumping, Alternative 1C (metric tons/year)

		Electricity CO_{2e}		Total CO_2e	
Condition	Equipment CO_2e	NEPA Point of Comparison	CEQA Baseline	NEPA Point of Comparison	CEQA Baseline
ELT	526	-	252,441	-	252,967
LLT	513	75,973	32,822	76,486	33,335

Note: The NEPA point of comparison compares total CO_2e emissions after implementation of Alternative 1C to the No Action Alternative, whereas the CEQA baseline compares total CO_2e emissions to Existing Conditions.

Table 22-60 summarizes equipment CO_2e emissions that would be generated in the BAAQMD, SMAQMD, and SJVAPCD (no operational emissions would be generated in the YSAQMD). The table does not include emissions from SWP pumping as these emissions would be generated by power plants located throughout the state (see discussion preceding this impact analysis). GHG emissions presented in Table 22-60 are therefore provided for information purposes only.

Table 22-60. Equipment CO_2e Emissions from Operation and Maintenance of Alternative 1C by Air District (metric tons/year)[a]

Air District	ELT	LLT
YSAQMD	481	465
SMAQMD	<1	<1
BAAQMD	46	48
Total	526	513

[a] Emissions do not include emissions generated by increased SWP pumping.

SWP Operational and Maintenance GHG Emissions Analysis

Alternative 1C would add approximately 1,675 GWh[30] of additional net electricity demand to operation of the SWP each year assuming 2060 conditions. Conditions at 2060 (LLT) are used for this analysis because they yield the largest potential additional net electricity requirements and therefore represent the largest potential impact. This 1,675 GWh is based on assumptions of future conditions and operations and includes all additional energy required to operate the project with BDCP Alternative 1C including any additional energy associated with additional water being moved through the system.

In the CAP, DWR developed estimates of historical, current, and future GHG emissions. Figure 22-7 shows those emissions as they were projected in the CAP and how those emissions projections would change with the additional electricity demands needed to operate the SWP with the addition of BDCP Alternative 1C. As shown in Figure 22-7, in 2024, the year BDCP Alternative 1C is projected

[30] Estimated net energy demand differs slightly from what is presented in Chapter 21, *Energy*. This is because the above analysis includes energy needed for transmission and distribution of water along the Valley String, which is required to enable a comparison with the assumptions in DWR's CAP.

to go online, DWR total emissions jump from around 912,000 metric tons of CO_2e to nearly 1.6 million metric tons of CO_2e. This elevated level is approximately 340,000 metric tons of CO_2e above DWR's designated GHG emissions reduction trajectory (red line, which is the linear interpolation between DWR's 2020 GHG emissions goal and DWR's 2050 GHG emissions goal.) The projection indicates that after the initial jump in emissions, existing GHG emissions reduction measures would bring the elevated GHG emissions level back down below DWR's GHG emissions reduction trajectory by 2044 and that DWR would still achieve its GHG emission reduction goal by 2050.

Because employing only DWR's existing GHG emissions reduction measures would result in a large initial increase in emissions and result in DWR emissions exceeding the emissions reduction trajectory for several years, DWR will take additional actions to reduce GHG emissions if BDCP Alternative 1C is implemented.

The CAP sets forth DWR's plan to manage its activities and operations to achieve its GHG emissions reduction goals. The CAP commits DWR to monitoring its emissions each year and evaluating its emissions every five years to determine whether it is on a trajectory to achieve its GHG emissions reduction goals. If it appears that DWR will not meet the GHG emission reduction goals established in the plan, DWR may make adjustments to existing emissions reduction measures, devise new measures to ensure achievement of the goals, or take other action. Given the scale of additional emissions that BDCP Alternative 1C would add to DWR's total GHG emissions, DWR has evaluated the most likely method that it would use to compensate for such an increase in GHG emissions: modification of DWR's REPP. The DWR REPP (GHG emissions reduction measure OP-1 in the CAP) describes the amount of additional renewable energy that DWR expects to purchase each year to meet its GHG emissions reduction goals. The REPP lays out a long-term strategy for renewable energy purchases, though actual purchases of renewable energy may not exactly follow the schedule in the REPP and will ultimately be governed by actual operations, measured emissions, and contracting.

Table 22-61 below shows how the REPP could be modified to accommodate BDCP Alternative 1C, and shows that additional renewable energy resources could be purchased during years 2022–2025 over what was programmed in the original REPP. The net result of this change is that by 2026 DWR's energy portfolio would contain nearly 1,700 GWh of renewable energy (in addition to hydropower generated at SWP facilities). This amount is nearly twice the amount called for in the original DWR REPP (1,692 compared to 792). In later years, 2031–2050, DWR would bring on slightly fewer additional renewable resources than programmed in the original REPP; however, over 13,000 additional GWh of electricity would be purchased under the modified REPP during the 40 year period 2011–2050 then under the original REPP. Figure 22-8 shows how this modified Renewable Energy Procurement Plan would affect DWR's projected future emissions with BDCP Alternative 1C.

Table 22-61. Changes in Expected Renewable Energy Purchases 2011–2050 (Alternative 1C)

	Additional GWh of Renewable Power Purchased (Above previous year)	
Year(s)	Original CAP	New CAP
2011–2020	36	36
2021	72	72
2022–2025	72	297
2026–2030	72	72
2031–2040	108	58
2041–2050	144	69
Total Cumulative	52,236	65,461

As shown in the analysis above and consistent with the analysis contained in the CAP and associated Initial Study and Negative Declaration for the CAP, BDCP Alternative 1C would not adversely affect DWR's ability to achieve the GHG emissions reduction goals set forth in the CAP. Further, Alternative 1C would not conflict with any of DWR's specific action GHG emissions reduction measures and implements all applicable project level GHG emissions reduction measures as set forth in the CAP. BDCP Alternative 1C is therefore consistent with the analysis performed in the CAP. There would be no adverse effect.

***CEQA Conclusion*:** SWP GHG emissions currently are below 1990 levels and achievement of the goals of the CAP means that total DWR GHG emissions will be reduced to 50% of 1990 levels by 2020 and to 80% of 1990 levels by 2050. The implementation of BDCP Alternative 1C would not affect DWR's established emissions reduction goals or baseline (1990) emissions and therefore would not result in a change in total DWR emissions that would be considered significant. Prior adoption of the CAP by DWR already provides a commitment on the part of DWR to make all necessary modifications to DWR's REPP (as described above) or any other GHG emission reduction measure in the CAP that are necessary to achieve DWR's GHG emissions reduction goals. Therefore no amendment to the approved CAP is necessary to ensure the occurrence of the additional GHG emissions reduction activities needed to account for BDCP-related operational emissions. The effect of BDCP Alternative 1C with respect to GHG emissions is less than cumulatively considerable and therefore less than significant. No mitigation is required.

Impact AQ-23: Generation of Cumulative Greenhouse Gas Emissions from Increased CVP Pumping as a Result of Implementation of CM1

NEPA Effects: As previously discussed, DWR's CAP cannot be used to evaluate environmental impacts associated with increased CVP pumping, as emissions associated with CVP are not under DWR's control and are not included in the CAP. Accordingly, GHG emissions resulting from increased CVP energy use are evaluated separately from GHG emissions generated as a result of SWP energy use.

Under Alternative 1C, operation of the CVP yields the generation of clean, GHG emissions-free, hydroelectric energy. This electricity is sold into the California electricity market or directly to energy users. Analysis of the No Action Alternative indicates that the CVP generates and will continue to generate all of the electricity needed to operate the CVP system and approximately 3,500 GWh of excess hydroelectric energy that would be sold to energy users throughout California. Implementation of Alternative 1C, however, would result in an increase of 167 GWh in the demand for CVP generated electricity, which would result in a reduction of 167 GWh or electricity available for sale from the CVP to electricity users. This reduction in the supply of GHG emissions-free electricity to the California electricity users could result in a potential effect impact of the project, as these electricity users would have to acquire substitute electricity supplies that may result in GHG emissions (although additional conservation is also a possible outcome as well).

It is unknown what type of power source (e.g., renewable, natural gas) would be substituted for CVP electricity or if some of the lost power would be made up with higher efficiency. Given State mandates for renewable energy and incentives for energy efficiency, it is possible that a considerable amount of this power would be replaced by renewable resources or would cease to be needed as a result of higher efficiency. However, to ensure a conservative analysis, indirect emissions were quantified for the entire quantity of electricity (167 GWh) using the current and future statewide energy mix (adjusted to reflect RPS) (please refer to Appendix 22A, *Air Quality Analysis Methodology,* for additional detail on quantification methods).

Substitution of 167 GWh of electricity with a mix of sources similar to the current statewide mix would result in emissions of 46,714 metric tons of CO_2e; however, under expected future conditions (after full implementation of the RPS), emissions would be 36,300 metric tons of CO_2e.

Use of CVP hydroelectricity to meet increased electricity demand from operation of CVP facilities associated with Alternative 1C would reduce available CVP hydroelectricity to other California electricity users. Substitution of the lost electricity with electricity from other sources could indirectly result in an increase of GHG emissions that is comparable or larger than the level of GHG emissions that trigger mandatory GHG reporting for major facilities. As a result, these emissions could contribute to a cumulatively considerable effect and are therefore adverse. However, these emissions would be caused by dozens of independent electricity users, who had previously bought CVP power, making decisions about different ways to substitute for the lost power. These decisions are beyond the control of Reclamation or any of the other BDCP Lead Agencies. Further, monitoring to determine the actual indirect change in emissions as a result of BDCP actions would not be feasible. In light of the impossibility of predicting where any additional emissions would occur, as well as Reclamation's lack of regulatory authority over the purchasers of power in the open market, no workable mitigation is available or feasible.

CEQA Conclusion: Operation of the CVP is a federal activity beyond the control of any State agency such as DWR, and the power purchases by private entities or public utilities in the private marketplace necessitated by a reduction in available CVP-generated hydroelectric power are beyond the control of the State, just as they are beyond the control of Reclamation. For these reasons, there are no feasible mitigation measures that could reduce this potentially significant indirect impact, which is solely attributable to operations of the CVP and not the SWP, to a less than significant level. This impact is therefore determined to be significant and unavoidable.

Impact AQ-24: Generation of Regional Criteria Pollutants from Implementation of CM2–CM11

NEPA Effects: Generation of criteria pollutants under Alternative 1C would be similar to Alternative 1A. Table 22-29 summarizes potential construction and operational emissions that may be generated by implementation of CM2–CM11. See the discussion of Impact AQ-24 under Alternative 1A.

Criteria pollutants from restoration and enhancement actions could exceed applicable general conformity *de minimis* levels and applicable local thresholds. The effect would vary according to the equipment used in construction of a specific conservation measure, the location, the timing of the actions called for in the conservation measure, and the air quality conditions at the time of implementation; these effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. The effect of increases in emissions during implementation of CM2–CM11 in excess of applicable general conformity *de minimis* levels and air district regional thresholds (Table 22-8) could violate air basin SIPs and worsen existing air quality conditions. Mitigation Measure AQ-24 would be available to reduce this effect, but emissions would still be adverse.

***CEQA Conclusion*:** Construction and operational emissions associated with the restoration and enhancement actions would result in a significant impact if the incremental difference, or increase, relative to Existing Conditions exceeds the applicable local air district thresholds shown in Table 22-8; these effects are expected to be further evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measure AQ-24 would be available to reduce this effect, but may not be sufficient to reduce emissions below applicable air quality management district thresholds (see Table 22-8). Consequently, this impact would be significant and unavoidable.

Mitigation Measure AQ-24: Develop an Air Quality Mitigation Plan (AQMP) to Ensure Air District Regulations and Recommended Mitigation are Incorporated into Future Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-24 under Impact AQ-24 in the discussion of Alternative 1A.

Impact AQ-25: Exposure of Sensitive Receptors to Health Hazards from Localized Particulate Matter, Carbon Monoxide, and Diesel Particulate Matter from Implementation of CM2–CM11

NEPA Effects: The potential for Alternative 1C to expose sensitive receptors increased health hazards from localized PM, CO, and DPM would be similar to Alternative 1A. Activities shown in Table 22-29 with the greatest potential to have short or long-term air quality impacts are also anticipated to have the greatest potential to expose receptors to substantial pollutant concentrations. The effect would vary according to the equipment used, the location and timing of the actions called for in the conservation measure, the meteorological and air quality conditions at the time of implementation, and the location of receptors relative to the emission source. Potential health effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions.

The effect of increases in PM, CO, or DPM (cancer and non-cancer-risk) in excess of applicable air district thresholds (Table 22-8) at receptor locations could result in adverse health impacts. Mitigation Measures AQ-24 and AQ-25 would be available to reduce this effect.

***CEQA Conclusion*:** Construction and operational emissions associated with the restoration and enhancement actions under Alternative 1C would result in a significant impact if PM, CO, or DPM (cancer and non-cancer-risk) concentrations at receptor locations exceed the applicable local air district thresholds shown in Table 22-8; these effects are expected to be further evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measures AQ-24 and AQ-25 would ensure localized concentrations at receptor locations would be below applicable air quality management district thresholds (see Table 22-8). Consequently, this impact would be less than significant.

Mitigation Measure AQ-24: Develop an Air Quality Mitigation Plan (AQMP) to Ensure Air District Regulations and Recommended Mitigation are Incorporated into Future Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-24 under Impact AQ-24 in the discussion of Alternative 1A.

Mitigation Measure AQ-25: Prepare a Project-Level Health Risk Assessment to Reduce Potential Health Risks from Exposure to Localized DPM and PM Concentrations

Please see Mitigation Measure AQ-25 under Impact AQ-25 in the discussion of Alternative 1A.

Impact AQ-26: Creation of Potential Odors Affecting a Substantial Number of People from Implementation of CM2–CM11

NEPA Effects: The potential for Alternative 1C to expose sensitive receptors increased odors would be similar to Alternative 1A. Accordingly, construction activities associated with CM2–CM11 are not anticipated to result in nuisance odors. Similarly, while restored land uses associated with the program have the potential to generate odors from natural processes, the emissions would be similar in origin and magnitude to the existing land use types in the restored area (e.g., managed wetlands). Moreover, specific odor effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Accordingly, odor-related effects associated with CM2–CM11 would not be adverse.

CEQA Conclusion**:** Alternative 1C would not result in the addition of major odor producing facilities. Diesel emissions during construction could generate temporary odors, but these would quickly dissipate and cease once construction is completed. Increases in wetland, tidal, and upland habitats may increase the potential for odors from natural processes. However, the origin and magnitude of odors would be similar to the existing land use types in the restored area (e.g., managed wetlands). Moreover, specific odor impacts would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Accordingly, the impact of exposure of sensitive receptors to potential odors would be less than significant. No mitigation is required.

Impact AQ-27: Generation of Cumulative Greenhouse Gas Emissions from Implementation of CM2–CM11

NEPA Effects: CM2–CM11 implemented under Alternative 1C would result in local GHG emissions from construction equipment and vehicle exhaust, similar to Alternative 1A. Restoration activities with the greatest potential for emissions include those that break ground and require use of earthmoving equipment. The type of restoration action and related construction equipment use are shown in Table 22-28. Implementing CM2–CM11 would also affect long-term sequestration rates through land use changes, such as conversion of agricultural land to wetlands, inundation of peat soils, drainage of peat soils, and removal or planting of carbon-sequestering plants.

Without additional information on site-specific characteristics associated with each of the restoration components, a complete assessment of GHG flux from CM2–CM11 is currently not possible. The effect of carbon sequestration and CH_4 generation would vary by land use type, season, and chemical and biological characteristics; these effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measures AQ-24 and AQ-27 would be available to reduce this

effect. However, due to the potential for increases in GHG emissions from construction and land use change, this effect would be adverse.

***CEQA Conclusion*:** The restoration and enhancement actions under Alternative 1C could result in a significant impact if activities are inconsistent with applicable GHG reduction plans, do not contribute to a lower carbon future, or generate excessive emissions, relative to other projects throughout the state. These effects are expected to be further evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measures AQ-24 and AQ-27 would be available to reduce this impact, but may not be sufficient to reduce to a less-than-significant level. Consequently, this impact would be significant and unavoidable.

Mitigation Measure AQ-24: Develop an Air Quality Mitigation Plan (AQMP) to Ensure Air District Regulations and Recommended Mitigation are Incorporated into Future Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-24 under Impact AQ-24 in the discussion of Alternative 1A.

Mitigation Measure AQ-27: Prepare a Land Use Sequestration Analysis to Quantify and Mitigate (as Needed) GHG Flux Associated with Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-27 under Impact AQ-27 in the discussion of Alternative 1A.

22.3.3.5 Alternative 2A—Dual Conveyance with Pipeline/Tunnel and Five Intakes (15,000 cfs; Operational Scenario B)

A total of five intakes would be constructed under Alternative 2A. For the purposes of this analysis, it was assumed that Intakes 1–5 or Intakes 1–3 and 6–7 would be constructed under Alternative 2A. Under this alternative, an intermediate forebay would be constructed, and the water conveyance facility would be a buried pipeline and tunnels (Figures 3-2 and 3-3 in Chapter 3, *Description of Alternatives.*

Construction and operation of Alternative 2A would require the use of electricity, which would be supplied by the California electrical grid. Power plants located throughout the state supply the grid with power, which will be distributed to the Study area to meet project demand. Power supplied by statewide power plants will generate criteria pollutants. Because these power plants are located throughout the state, criteria pollutant emissions associated with Alternative 2A electricity demand cannot be ascribed to a specific air basin or air district within the Study area. Criteria pollutant emissions from electricity consumption are therefore provided for informational purposes only and are not included in the impact conclusion.

Electricity demand for construction of Alternative 2A would be to equal demand required for Alternative 1A. Electricity emissions generated by Alternative 1A would therefore be representative of emissions generated by Alternative 2A. Refer to Table 22-11 for a summary of electricity-related criteria pollutants during construction (years 2016 through 2029) of Alternative 1A that are applicable to this alternative. Operational emissions would be different from Alternative 1A and are provided in Table 22-62.

Table 22-62. Criteria Pollutant Emissions from Electricity Consumption: Net Project Operations, Alternative 2A (tons/year) [a,b]

Year	Analysis	ROG	CO	NO_X	PM10	PM2.5[c]	SO_2
ELT	CEQA	1	8	111	9	9	47
LLT	NEPA	2	15	199	17	17	84
LLT	CEQA	0	2	34	3	3	14

NEPA = Compares criteria pollutant emissions after implementation of Alternative 2A to the No Action Alternative.

CEQA = Compares criteria pollutant emissions after implementation of Alternative 2A to Existing Conditions.

[a] Emissions assume implementation of RPS (see Appendix 22A, *Air Quality Analysis Methodology*). Power plants that generate electricity for the proposed project would be subject to local air district permitting requirements, including standards to implement BACT to reduce criteria pollutant emissions.

[b] Because GHG emissions are cumulative (see Section 22.3.2.1) and not evaluated at the local air basin or air district level, they are discussed in Impacts AQ-21 and AQ-22. The GHG analysis for SWP power utilizes actual and forecasted GHG emissions rates for the SWP system, which differs slightly from the above analysis. Statewide grid average emission factors were utilized for the above analysis as criteria pollutant emission factors for SWP were unavailable. Please also note that the above analysis does not account for additional renewable energy that will be procured through modifications to DWR's REPP (see Impact AQ-22). Accordingly, the emissions results presented above represent a conservative assessment of potential criteria pollutant emissions.

[c] Emission factors for PM2.5 are currently unavailable. Consequently, PM2.5 emissions were assumed to equal PM10 emissions. Because PM2.5 represents a fraction of PM10, this approach represents a conservative assessment of PM2.5 emissions from electricity consumption.

Alternative 2A would comprise physical/structural components similar to those under Alternative 1A, but would entail an operable barrier along the San Joaquin separate fish movement corridor at the upstream confluence of Old River and the San Joaquin River (head of Old River). Emissions generated by construction of all features other than the head of Old River barrier under Alternative 1A would be representative of emissions generated by Alternative 2A (refer to Table 22-12).

The head of Old River barrier would be constructed within the SJVAPCD bteween2022 and 2024. To ensure the emissions analysis within the SJVAPCD accurately evaluates all project components, construction emissions associated with the head of Old River barrier were quantified and added to the emissions estimates for the SJVAPCD under Alternative 1A. The resulting emissions are provided in Table 22-63. Exceedances of the air district thresholds are shown in underlined text.

Table 22-63. Criteria Pollutant Emissions from Construction of Alternative 2A within the SJVAPCD (tons/year)

Year	ROG	NO_X	CO	PM10			PM2.5			SO_2
				Exhaust	Dust	Total	Exhaust	Dust	Total	
2016	0	0	0	0	2	2	0	<1	<1	0
2017	0	0	0	0	0	0	0	0	0	0
2018	2	7	11	<1	12	12	<1	2	2	<1
2019	11	81	78	1	18	19	1	2	3	<1
2020	20	139	137	2	35	36	2	4	6	<1
2021	30	217	217	3	56	58	3	7	9	1
2022	29	189	214	2	33	35	2	4	6	1
2023	25	154	187	2	17	19	2	2	4	1
2024	24	140	171	1	17	18	1	2	4	<1
2025	15	92	105	1	13	14	1	2	3	<1
2026	6	37	35	<1	3	3	<1	<1	1	<1
2027	<1	<1	1	1	<1	1	1	<1	1	<1
2028	0	0	0	0	0	0	0	0	0	0
2029	0	0	0	0	0	0	0	0	0	0
Thresholds	10	10	-	-	-	15	-	-	15	-

Daily operation and maintenance activities under Alternative 2A would be the same as those generated under Alternative 1A (see Table 22-13). Yearly maintenance would be similar to those under Alternative 1A, but would also include annual inspections and sediment removal at the operable barrier in San Joaquin County. Table 22-64 summarizes annual criteria pollutant emissions associated with operation of Alternative 2A in the SJVAPCD.

Table 22-64. Criteria Pollutant Emissions from Operation of Alternative 2A in SJVAPCD (tons per year)

Condition	San Joaquin Valley Air Pollution Control District					
	ROG	NO_X	CO	PM10	PM2.5	SO_2
ELT	0.01	0.08	0.14	0.02	0.01	<0.01
LLT	0.01	0.07	0.13	0.02	0.01	<0.01
Thresholds	*10*	*10*	-	*15*	*15*	-

Impact AQ-1: Generation of Criteria Pollutants in Excess of the SMAQMD Regional Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: Construction activity required for Alternative 2A within the SMAQMD was assumed to equal activity required for Alternative 1A. Emissions generated by Alternative 1A would therefore be representative of emissions generated by Alternative 2A. As shown in Table 22-12, emissions would exceed SMAQMD's daily NO_X threshold, even with implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*). Since NO_X is a precursor to ozone and PM, exceedances of SMAQMD's daily NO_X threshold could impact both regional ozone and PM formation, which could worsen regional air quality and air basin attainment of the NAAQS and CAAQS.

While equipment could operate at any work area identified for this alternative, the highest level of NO_X and fugitive dust emissions in the SMAQMD are expected to occur at those sites where the duration and intensity of construction activities would be greatest. This includes all intake and intake pumping plant sites along the east bank of the Sacramento River, as well as the intermediate forebay (and pumping plant) site west of South Stone Lake and east of the Sacramento River. See the discussion of Impact AQ-1 under Alternative 1A.

Environmental commitments outlined in Appendix 3B, *Environmental Commitments,* will reduce construction-related emissions; however, as shown in Table 22-12, NO_X and emissions would still exceed SMAQMD's threshold identified in Table 22-8 and would result in an adverse effect to regional air quality. Mitigation Measures AQ-1a and AQ-1b would be available to reduce NO_X emissions, and would thus address regional effects related to secondary ozone and PM formation.

CEQA Conclusion**:** NO_X emissions generated during construction would exceed SMAQMD threshold identified in Table 22-8. Since NO_X is a precursor to ozone and PM, exceedances of SMAQMD's daily NO_X threshold could impact both regional ozone and PM formation. SMAQMD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS or NAAQS. The impact of generating NO_X emissions in excess of local air district thresholds would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. This would be a significant impact. Mitigation Measures AQ-1a and AQ-1b would be available to reduce NO_X emissions to a less-than-significant level by offsetting emissions to quantities below SMAQMD CEQA thresholds (see Table 22-8).

Mitigation Measure AQ-1a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-1a under Impact AQ-1 in the discussion of Alternative 1A.

Mitigation Measure AQ-1b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-1b under Impact AQ-1 in the discussion of Alternative 1A.

Impact AQ-2: Generation of Criteria Pollutants in Excess of the YSAQMD Regional Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: Construction activity required for Alternative 2A within the YSAQMD was assumed to equal activity required for Alternative 1A. Emissions generated by Alternative 1A would therefore be representative of emissions generated by Alternative 2A. As shown in Table 22-12, emissions would exceed YSAQMD's NO_X and PM10 thresholds, even with implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*).

Since NO_X is a precursor to ozone and PM, exceedances of SMAQMD's daily NO_X threshold could impact both regional ozone and PM formation, which could worsen regional air quality and air basin attainment of the NAAQS and CAAQS. Similarly, exceedances of YSAQMD's PM10 threshold could impede attainment of the NAAQS and CAAQS for PM10. All emissions generated within YSAQMD are a result of haul truck movement for equipment and material delivery.

Environmental commitments outlined in Appendix 3B, *Environmental Commitments,* will reduce construction-related emissions; however, as shown in Table 22-12, NO_X and PM10 emissions would still exceed the applicable YSAQMD thresholds identified in Table 22-8 and result in an adverse regional effect to air quality. Mitigation Measures AQ-1a and AQ-1b are available to reduce NO_X and PM10 emissions, and would thus address regional effects related to secondary ozone and PM formation.

***CEQA Conclusion*:** Emissions of NO_X and PM10 generated during construction would exceed YSAQMD's regional thresholds identified in Table 22-8. Since NO_X is a precursor to ozone and NO_X is a precursor to PM, exceedances of YSAQMD's NO_X threshold could impact both regional ozone and PM formation, which could worsen regional air quality and air basin attainment of the NAAQS and CAAQS. Similarly, exceedances of YSAQMD's PM10 threshold could impede attainment of the NAAQS and CAAQS for PM10. YSAQMD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS or NAAQS. The impact of generating NO_X and PM10 in excess of local air district regional thresholds would therefore violate applicable air quality standards in the study area and could contribute to or worsen an existing air quality conditions. This would be a significant impact. Mitigation Measures AQ-1a and AQ-1b would be available to reduce NO_X and PM10 emissions to a less-than-significant level by offsetting emissions to quantities below YSAQMD CEQA thresholds (see Table 22-8).

Mitigation Measure AQ-1a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-1a under Impact AQ-1 in the discussion of Alternative 1A.

Mitigation Measure AQ-1b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-1b under Impact AQ-1 in the discussion of Alternative 1A.

Impact AQ-3: Generation of Criteria Pollutants in Excess of the BAAQMD Regional Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: Construction activity required for Alternative 2A within the BAAQMD was assumed to equal activity required for Alternative 1A. Emissions generated by Alternative 1A would therefore be representative of emissions generated by Alternative 2A. As shown in Table 22-12, emissions would exceed BAAQMD's daily thresholds for ROG and NO_X, even with implementation of environmental commitments. All other pollutants would be below air district thresholds and therefore would not result in an adverse air quality effect.

Since ROG and NO_X are precursors to ozone and NO_X is a precursor to PM, exceedances of BAAQMD's ROG and NO_X thresholds could impact both regional ozone and PM formation, which could worsen regional air quality and air basin attainment of the NAAQS and CAAQS.

While equipment could operate at any work area identified for this alternative, the highest level of ROG and NO_X emissions in the BAAQMD are expected to occur at those sites where the duration and intensity of construction activities would be greatest, including the site of the Byron Tract Forebay adjacent to and south of Clifton Court Forebay.

Environmental commitments outlined in Appendix 3B, *Environmental Commitments,* will reduce construction-related emissions; however, as shown in Table 22-12, ROG and NO_X emissions would still exceed the applicable air district thresholds identified in Table 22-8 and result in an adverse effect to air quality. Mitigation Measures AQ-3a and AQ-3b would be available to address this effect.

CEQA Conclusion**:** Emissions of ROG and NO_X precursors generated during construction would exceed BAAQMD regional thresholds identified in Table 22-8. Since ROG and NO_X are precursors to ozone and NO_X is a precursor to PM, exceedances of BAAQMD's ROG and NO_X thresholds could impact both regional ozone and PM formation. BAAQMD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS or NAAQS. The impact of generating ROG and NO_X emissions in excess of local air district regional thresholds would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. This would be a significant impact. Mitigation Measures AQ-3a and AQ-3b would be available to reduce ROG and NO_X emissions to a less-than-significant level by offsetting emissions to quantities below BAAQMD CEQA thresholds (see Table 22-8).

Mitigation Measure AQ-3a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within BAAQMD/SFBAAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable BAAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-3a under Impact AQ-3 in the discussion of Alternative 1A.

Mitigation Measure AQ-3b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the BAAQMD/SFBAAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable BAAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-3b under Impact AQ-3 in the discussion of Alternative 1A.

Impact AQ-4: Generation of Criteria Pollutants in Excess of the SJVAPCD Regional Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: As shown in Table 22-63, construction emissions would exceed SJVAPCD's annual thresholds for the following years and pollutants, even with implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*). All other pollutants would be below air district thresholds and therefore would not result in an adverse air quality effect.

- ROG: 2020–2025
- NO_X: 2019–2026

- PM10: 2019–2024

Since ROG and NO_X are precursors to ozone and NO_X is a precursor to PM, exceedances of SJVAPCD's ROG and NO_X thresholds could impact both regional ozone and PM formation, which could worsen regional air quality and air basin attainment of the NAAQS and CAAQS. Similarly, exceedances of SJVAPCD's PM10 threshold could impede attainment of the NAAQS and CAAQS for PM10.

While equipment could operate at any work area identified for this alternative, the highest level of ROG, NO_X, and PM10 emissions in the SJVAPCD is expected to occur at those sites where the duration and intensity of construction activities would be greatest. This includes all temporary and permanent utility sites, as well as all construction sites along the pipeline/tunnel conveyance alignment. For a map of the proposed tunnel alignment, see Mapbook Figure M3-1.

Environmental commitments outlined in Appendix 3B, *Environmental Commitments* will reduce construction-related emissions; however, as shown in Table 22-63, ROG, NO_X, and PM10 emissions would still exceed the applicable air district thresholds identified in Table 22-8 and result in a regional adverse effect to air quality. Mitigation Measures AQ-4a and AQ-4b are available to reduce ROG, NO_X, and PM10 emissions, and would thus address regional effects related to secondary ozone and PM formation.

***CEQA Conclusion*:** Emissions of ROG, NO_X, and PM10 generated during construction would exceed SJVAPCD's regional significance threshold identified in Table 22-8. Since ROG and NO_X are precursors to ozone and NO_X is a precursor to PM, exceedances of SJVAPCD's ROG and NO_X thresholds could impact both regional ozone and PM formation, which could worsen regional air quality and air basin attainment of the NAAQS and CAAQS. Similarly, exceedances of SJVAPCD's PM10 threshold could impede attainment of the NAAQS and CAAQS for PM10. SJVAPCD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS or NAAQS. The impact of generating ROG, NO_X, and PM10 in excess of local air district thresholds would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. This impact would therefore be significant. This would be a significant impact. Mitigation Measures AQ-4a and AQ-4b would be available to reduce ROG, NO_X, and PM10 emissions to a less-than-significant level by offsetting emissions to quantities below SJVAPCD CEQA thresholds (see Table 22-8).

Mitigation Measure AQ-4a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4a under Impact AQ-4 in the discussion of Alternative 1A.

Mitigation Measure AQ-4b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4b under Impact AQ-4 in the discussion of Alternative 1A.

Impact AQ-5: Generation of Criteria Pollutants in Excess of the SMAQMD Regional Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance activities in SMAQMD required for Alternative 2A were assumed to equal activities required for Alternative 1A. Emissions generated by Alternative 1A would therefore be representative of emissions generated by Alternative 2A. As shown in Table 22-13, emissions would not exceed SMAQMD's regional thresholds of significance and there would be no adverse effect. See the discussion of Impact AQ-5 under Alternative 1A.

***CEQA Conclusion*:** Emissions generated during operation and maintenance activities would not exceed SMAQMD thresholds for criteria pollutants. SMAQMD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS or NAAQS. The impact of generating emissions in excess of local air district would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Because project operations would not exceed SMAQMD regional thresholds, the impact would be less than significant. No mitigation is required.

Impact AQ-6: Generation of Criteria Pollutants in Excess of the YSAQMD Regional Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Alternative 2A would not involve the construction of any permanent features in the YSAQMD that would require routine operations and maintenance. No operational emissions would be generated in the YSAQMD. Consequently, operation of Alternative 2A would neither exceed the YSAQMD thresholds of significance nor result in an adverse effect on air quality.

***CEQA Conclusion*:** No operational or maintenance emissions generated by the alternative would occur in YSAQMD and, therefore, YSAQMD's regional thresholds would not be exceeded (see Table 22-8). This impact would be less than significant. No mitigation is required.

Impact AQ-7: Generation of Criteria Pollutants in Excess of the BAAQMD Regional Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance activities in BAAQMD required for Alternative 2A were assumed to equal activities required for Alternative 1A. Emissions generated by Alternative 1A would therefore be representative of emissions generated by Alternative 2A. As shown in Table 22-13, emissions would not exceed BAAQMD's regional thresholds of significance and there would be no adverse effect. See the discussion of Impact AQ-7 under Alternative 1A.

***CEQA Conclusion*:** Emissions generated during operation and maintenance activities would not exceed BAAQMD regional thresholds for criteria pollutants. BAAQMD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district thresholds would violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Because project operations would not exceed BAAQMD regional thresholds, the impact would be less than significant. No mitigation is required.

Impact AQ-8: Generation of Criteria Pollutants in Excess of the SJVAPCD Regional Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance in SJVAPCD include annual inspections, sediment removal, and tunnel dewatering (see Appendix 22A, *Air Quality Analysis Methodology,* for additional detail). The highest concentration of operational emissions in the SJVPACD is expected at routine inspection sites along the pipeline/tunnel conveyance alignment and at the operable barrier. As shown in Table 22-64, operation and maintenance activities under Alternative 2A would not exceed SJVAPCD's regional thresholds of significance (see Table 22-8). Accordingly, project operations would not contribute to or worsen existing air quality exceedances. There would be no adverse effect.

CEQA Conclusion: Emissions generated during operation and maintenance activities would not exceed SJVAPCD's regional thresholds of significance. SJVAPCD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district thresholds would violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Because project operations would not exceed SJVAPCD regional thresholds, the impact would be less than significant. No mitigation is required.

Impact AQ-9: Exposure of Sensitive Receptors to Health Hazards from Localized Particulate Matter in Excess of SMAQMD's Health-Based Concentration Thresholds

NEPA Effects: Construction activity required for Alternative 2A within the SMAQMD was assumed to equal activity required for Alternative 1A. Emissions and associated health risks from exposure to localized PM under Alternative 1A would therefore be representative of emissions and health risks generated by Alternative 2A.

As shown in Table 22-14, concentrations of annual PM10 and PM2.5 would be below the SMAQMD's significance thresholds. However, concentrations of PM10 would exceed SMAQMD's 24-hour PM10 threshold near intakes and intake work areas, even with implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*). Receptors exposed to PM10 concentrations in excess of SMAQMD's threshold could experience increased risk for adverse human health effects. Mitigation Measure AQ-9 is available to address this effect.

CEQA Conclusion: Respirable particulates pose a human health hazard by bypassing the defenses within the mucous ciliary system and entering deep lung tissue. Construction of Alternative 2A would result in the short-term exposure of receptors to PM10 concentrations that exceed SMAQMD threshold. This would be a significant impact. Mitigation Measure AQ-9 outlines a tiered strategy to reduce PM10 concentrations and public exposure to a less-than-significant level.

Mitigation Measure AQ-9: Implement Measures to Reduce Re-Entrained Road Dust and Receptor Exposure to PM2.5 and PM10

Please see Mitigation Measure AQ-9 under Impact AQ-9 in the discussion of Alternative 1A.

Impact AQ-10: Exposure of Sensitive Receptors to Health Hazards from Localized Particulate Matter in Excess of YSAQMD's Health-Based Concentration Thresholds

NEPA Effects: Construction activity required for Alternative 2A within the YSAQMD was assumed to equal activity required for Alternative 1A. Emissions and associated health risks from exposure to localized PM under Alternative 1A would therefore be representative of emissions and health risks generated by Alternative 2A. As shown previously in Table 22-15, concentrations of particulate matter would not exceed YSAQMD's 24-hour and annual PM10 and PM2.5 thresholds and consequently would not result in an adverse effect to human health.

CEQA Conclusion: Respirable particulates pose a human health hazard by bypassing the defenses within the mucous ciliary system and entering deep lung tissue. Construction of Alternative 2A would result in PM2.5 and PM10 concentrations at receptor locations that are below the significance thresholds established by the YSAQMD. As such, localized particulate matter concentrations at analyzed receptors would not result in significant human health impacts. No mitigation is required.

Impact AQ-11: Exposure of Sensitive Receptors to Health Hazards from Localized Particulate Matter in Excess of BAAQMD's Health-Based Concentration Thresholds

NEPA Effects: Construction activity required for Alternative 2A within the BAAQMD was assumed to equal activity required for Alternative 1A. Emissions and associated health risks from exposure to localized PM under Alternative 1A would therefore be representative of emissions and health risks generated by Alternative 2A. As shown in Table 22-16, concentrations of particulate matter would not exceed BAAQMD's annual PM2.5 threshold and consequently would not result in an adverse effect to human health.

CEQA Conclusion: Respirable particulates pose a human health hazard by bypassing the defenses within the mucous ciliary system and entering deep lung tissue. Construction of Alternative 2A would result in PM2.5 concentrations at receptor locations that are below the significance thresholds established by the BAAQMD. As such, localized particulate matter concentrations at analyzed receptors would not result in significant human health impacts. No mitigation is required.

Impact AQ-12: Exposure of Sensitive Receptors to Health Hazards from Localized Particulate Matter in Excess of SJVAPCD's Health-Based Concentration Thresholds

NEPA Effects: The addition of the operational barrier in SJVAPCD would not generate additional construction emissions that would substantially affect sensitive receptors, relative to emissions associated with Alternative 1A. Accordingly, construction activity required for Alternative 2A within the SJVACPD was assumed to equal activity required for Alternative 1A. Emissions and associated health risks from localized exposure to localized PM under Alternative 1A would therefore be representative of emissions and health risks generated by Alternative 2A.

As shown in Table 22-17, with the exception of 24-hour PM10, maximum predicted PM2.5 and PM10 concentrations are less than SJVAPCD's adopted thresholds. Concentrations of PM10 would exceed SJVAPCD's 24-hour PM10 threshold, even with implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*). Receptors exposed to PM10 concentrations in excess of SMAQMD's threshold could experience increased risk for adverse human health effects. Mitigation Measure AQ-9 is available to address this effect.

CEQA Conclusion: Respirable particulates pose a human health hazard by bypassing the defenses within the mucous ciliary system and entering deep lung tissue. Construction of Alternative 2A would result in the short-term exposure of receptors to PM10 concentrations that exceed SJVAPCD threshold. This would be a significant impact. Mitigation Measure AQ-9 outlines a tiered strategy to reduce PM10 concentrations and public exposure to a less-than-significant level.

Mitigation Measure AQ-9: Implement Measures to Reduce Re-Entrained Road Dust and Receptor Exposure to PM2.5 and PM10

Please see Mitigation Measure AQ-9 under Impact AQ-9 in the discussion of Alternative 1A.

Impact AQ-13: Exposure of Sensitive Receptors to Health Hazards from Localized Carbon Monoxide

NEPA Effects: Construction activity required for Alternative 2A would be similar to activity required for Alternative 1A. Accordingly, the potential for Alternative 2A to result in CO hot-spots during construction would be the same as Alternative 1A. Given that construction activities typically do not result in CO hot-spots, onsite concentrations must comply with OSHA standards, and CO levels dissipate as a function of distance, equipment-generated CO emissions (see Table 22-12) are not anticipated to result in adverse health hazards to sensitive receptors. Refer to Impact AQ-13 under Alternative 1A.

Traffic associated with construction may contribute to increase roadway congestion, which could lead to conditions conducive to CO hot-spot formation. As shown in Table 19-8, the highest peak hour traffic volumes under BPBGPP—12,567 vehicles per hour—would occur on westbound Interstate 80 between Suisun Valley Road and State Route 12. This is about half of the congested traffic volume modeled by BAAQMD (24,000 vehicles per hour) that would be needed to contribute to a localized CO hot-spot, and less than half of the traffic volume modeled by SMAQMD (31,600 vehicles per hour). Accordingly, construction traffic is not anticipated to result in adverse health hazards to sensitive receptors.

***CEQA Conclusion*:** Continuous engine exhaust may elevate localized CO concentrations. Receptors exposed to these CO "hot-spots" may have a greater likelihood of developing adverse health effects. Construction sites are less likely to result in localized CO hot-spots due to the nature of construction activities (Sacramento Metropolitan Air Quality Management District 2014), which normally utilize diesel-powered equipment for intermittent or short durations. Moreover, construction sites must comply with the OSHA CO exposure standards for onsite workers. Accordingly, given that construction activities typically do not result in CO hot-spots, onsite concentrations must comply with OSHA standards, and CO levels dissipate as a function of distance, equipment-generated CO emissions are not anticipated to result in significant health hazards to sensitive receptors. Similarly, peak-hour construction traffic on local roadways would not exceed BAAQMD's or SMAQMD's conservative screening criteria for the formation potential CO hot-spots. This impact would be less than significant. No mitigation is required.

Impact AQ-14: Exposure of Sensitive Receptors to Health Hazards from Diesel Particulate Matter in Excess of SMAQMD's Chronic Non-Cancer and Cancer Risk Thresholds

NEPA Effects: Construction activity required for Alternative 2A within the SMAQMD was assumed to equal activity required for Alternative 1A. Emissions and associated health risks from localized exposure to DPM under Alternative 1A would therefore be representative of emissions and health risks generated by Alternative 2A. As shown in Table 22-14, Alternative 1A would not exceed the SMAQMD's thresholds for chronic non-cancer hazard or cancer risk. Therefore, this alternative's effect of exposure of sensitive receptors to DPM emissions and their health hazards during construction would not be adverse.

***CEQA Conclusion*:** DPM generated during construction poses inhalation-related chronic non-cancer hazard and cancer risk if adjacent receptors are exposed to significant concentrations for prolonged durations. The DPM generated during Alternative 2A construction would not exceed the SMAQMD's chronic non-cancer hazard or cancer risk threshold. Therefore, this impact would be less than significant. No mitigation is required.

Impact AQ-15: Exposure of Sensitive Receptors to Health Hazards from Diesel Particulate Matter in Excess of YSAQMD's Chronic Non-Cancer and Cancer Risk Thresholds

NEPA Effects: Construction activity required for Alternative 2A within the YSAQMD was assumed to equal activity required for Alternative 1A. Emissions and associated health risks from localized exposure to DPM under Alternative 1A would therefore be representative of emissions and health risks generated by Alternative 2A. As shown in Table 22-19, Alternative 1A would not exceed the YSAQMD's chronic non-cancer or cancer thresholds and, thus, would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to DPM emissions and their health hazards during construction would not be adverse.

***CEQA Conclusion*:** DPM generated during construction poses inhalation-related chronic non-cancer hazard and cancer risk if adjacent receptors are exposed to significant concentrations for prolonged durations. The DPM generated during Alternative 2A construction would not exceed the YSAQMD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this impact for DPM emissions would be less than significant. No mitigation is required.

Impact AQ-16: Exposure of Sensitive Receptors to Health Hazards from Diesel Particulate Matter in Excess of BAAQMD's Chronic Non-Cancer and Cancer Risk Thresholds

NEPA Effects: Construction activity required for Alternative 2A within the BAAQMD was assumed to equal activity required for Alternative 1A. Emissions and associated health risks from localized exposure to DPM under Alternative 1A would therefore be representative of emissions and health risks generated by Alternative 2A. As shown in Table 22-20, Alternative 1A would not exceed the BAAQMD's thresholds for chronic non-cancer hazard; however, it would exceed BAAQMD's cancer risk threshold. Therefore, this alternative's effect of exposure of sensitive receptors to DPM-related health hazards during construction would be adverse.

Mitigation Measure AQ-16 would be available to reduce exposure to substantial cancer risk by relocating affected receptors. Although Mitigation Measure AQ-16 would reduce the severity of this effect, the BDCP proponents are not solely responsible for implementation of the measure. If a landowner chooses not to accept DWR's offer of relocation assistance, an adverse effect in the form excess cancer risk above air district thresholds would occur. Therefore, this effect would be adverse. If, however, all landowners accept DWR's offer of relocation assistance, effects would not be adverse.

***CEQA Conclusion*:** DPM generated during construction poses inhalation-related chronic non-cancer hazard and cancer risk if adjacent receptors are exposed to significant concentrations for prolonged durations. The DPM generated during Alternative 2A construction would not exceed the BAAQMD's chronic non-cancer hazard threshold; however, it would exceed the BAAQMD's cancer thresholds. Therefore, this impact would be significant.

Mitigation Measure AQ-16 would be available to reduce exposure to substantial cancer risk by relocating affected receptors. Although Mitigation Measure AQ-16 would reduce the severity of this effect, the BDCP proponents are not solely responsible for implementation of the measure. If a landowner chooses not to accept DWR's offer of relocation assistance, a significant impact in the form excess cancer risk above air district thresholds would occur. Therefore, this effect would be significant and unavoidable. If, however, all landowners accept DWR's offer of relocation assistance, the impact would be less than significant.

Mitigation Measure AQ-16: Relocate Sensitive Receptors to Avoid Excess Cancer Risk

Please see Mitigation Measure AQ-16 under Impact AQ-16 in the discussion of Alternative 1A.

Impact AQ-17: Exposure of Sensitive Receptors to Health Hazards from Diesel Particulate Matter in Excess of SJVAPCD's Chronic Non-Cancer and Cancer Risk Thresholds

NEPA Effects: The addition of the operational barrier in SJVAPCD would not generate additional construction emissions that would substantially affect sensitive receptors, relative to emissions associated with Alternative 1A. Accordingly, construction activity required for Alternative 2A within the SJVACPD was assumed to equal activity required for Alternative 1A. Emissions and associated health risks from localized exposure to DPM under Alternative 1A would therefore be representative of emissions and health risks generated by Alternative 2A.

As shown in Table 22-21, Alternative 2A would not exceed the SJVAPCD's chronic non-cancer or cancer thresholds and, thus, would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to DPM emissions and their health hazards during construction would not be adverse.

***CEQA Conclusion*:** DPM generated during construction poses inhalation-related chronic non-cancer hazard and cancer risk if adjacent receptors are exposed to significant concentrations for prolonged durations. The DPM generated during Alternative 2A construction would not exceed the SJVAPCD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this impact for DPM emissions would be less than significant. No mitigation is required.

Impact AQ-18: Exposure of Sensitive Receptors to *Coccidioides immitis* (Valley Fever)

***NEPA Effects*:** As discussed under Alternative 1A, earthmoving activities during construction could release *C. immitis* spores if filaments are present and other soil chemistry and climatic conditions are conducive to spore development. Receptors adjacent to the construction area may therefore be exposed to increase risk of inhaling *C. immitis* spores and subsequent development of Valley Fever. Dust-control measures are the primary defense against infection (United States Geological Survey 2000). Implementation of advanced air-district recommended fugitive dust controls outlined in Appendix 3B, *Environmental Commitments*, would avoid dusty conditions and reduce the risk of contracting Valley Fever through routine watering and other controls. Therefore, this alternative's effect of exposure of sensitive receptors to increased Valley Fever risk during construction would not be adverse.

***CEQA Conclusion*:** Construction of the water conveyance facility would involve earthmoving activities that could release *C. immitis* spores if filaments are present and other soil chemistry and climatic conditions are conducive to spore development. Receptors adjacent to the construction area may therefore be exposed to increase risk of inhaling *C. immitis* spores and subsequent development of Valley Fever. Implementation of air-district recommended fugitive dust controls outlined in Appendix 3B, *Environmental Commitments*, would avoid dusty conditions and reduce the risk of contracting Valley Fever through routine watering and other controls. Therefore, this impact would be less than significant. No mitigation is required.

Impact AQ-19: Creation of Potential Odors Affecting a Substantial Number of People during Construction or Operation of the Proposed Water Conveyance Facility

NEPA Effects: As discussed under Alternative 1A, odors from construction activities would be localized and generally confined to the immediate area surrounding the construction site. Moreover, odors would be temporary and localized, and they would cease once construction activities have been completed. Thus, it is not anticipated that construction of CM1 would create objectionable odors from construction equipment or asphalt paving.

Construction of the water conveyance facility would require removal of subsurface material during tunnel excavation and sediment removal. As discussed under Alternative 1A, geotechnical tests indicate that VOC levels in Plan Area soils are below the method detection limits, indicating that organic decay of exposed RTM and sediment will be relatively low (URS 2014). Moreover, drying and stockpiling of the removed RTM and sediment will occur under aerobic conditions, which will further limit any potential decomposition and associated malodorous products. Accordingly, it is not anticipated that tunnel and sediment excavation would create objectionable odors.

Typical facilities known to produce odors include landfills, wastewater treatment plants, food processing facilities, and certain agricultural activities. Alternative 2A would not result in the addition of facilities associated with odors, and as such, long-term operation of the water conveyance facility would not result in objectionable odors.

CEQA Conclusion: Alternative 2A would not result in the addition of major odor producing facilities. Diesel emissions during construction could generate temporary odors, but these would quickly dissipate and cease once construction is completed. Likewise, potential odors generated during asphalt paving would be addressed through mandatory compliance with air district rules and regulations. While tunnel excavation would unearth substantial quantities of RTM, geotechnical tests indicate that soils in the Plan Area have relatively low organic constituents. Moreover, drying and stockpiling of the removed RTM will occur under aerobic conditions, which will further limit any potential decomposition and associated malodorous products. Accordingly, the impact of exposure of sensitive receptors to potential odors during construction would be less than significant. No mitigation is required.

Impact AQ-20: Generation of Criteria Pollutants in the Excess of Federal *De Minimis* Thresholds from Construction and Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: As discussed above, emissions generated by Alternative 1A within the SFNA and SFBAAB would be representative of emissions generated by Alternative 2A (see Table 22-22). Due to the operable barrier at head of Old River, emissions within the SJVAB would be slightly higher than those quantified for Alternative 1A. To ensure the emissions analysis within the SJVAB accurately evaluates all project components, construction emissions associated with the head of Old River barrier were quantified and added to the emissions estimates for the SJVAB under Alternative 1A. The resulting emissions are provided in Table 22-65. Exceedances of the federal *de minimis* thresholds are shown in <u>underlined</u> text.

Table 22-65. Criteria Pollutant Emissions from Construction and Operation of Alternative 2A in Nonattainment and Maintenance the SJVAB (tons/year)

Year	ROG	NO_X[a]	CO[b]	PM10	PM2.5	SO_2
2016	0	0	0	2	<1	0
2017	0	0	0	0	0	0
2018	2	7	0	12	2	<1
2019	11	81	0	19	3	<1
2020	20	139	0	36	6	<1
2021	30	217	0	58	9	1
2022	29	189	0	35	6	1
2023	25	154	0	19	4	1
2024	24	140	0	18	4	<1
2025	15	92	0	14	3	<1
2026	6	37	0	3	1	<1
2027	<1	<1	0	1	1	<1
2028	0	0	0	0	0	0
2029	0	0	0	0	0	0
ELT	0.01	0.08	0.14	0.02	0.01	<0.01
LLT	0.01	0.07	0.13	0.02	0.01	<0.01
De Minimis	10	10	100	100	100	100

Notes

[a] NO_X emissions in excess of 100 tons per year within federally designated PM10 and PM2.5 nonattainment or maintenance areas trigger a secondary PM10 and PM2.5 precursor threshold. NO_X emissions in excess of this secondary threshold could conflict with the applicable PM10 and PM2.5 SIPs. Accordingly, NO_X offsets pursued for the purposes of general conformity for those years in which NO_X emissions exceed 100 tons must occur within the federally designated PM2.5 nonattainment and PM10 maintenance areas, as applicable.

[b] The proposed water conveyance facility is located within a federally designated CO attainment area. Accordingly, CO emissions generated by construction of CM1 are not subject to the General Conformity Rule and are excluded from the emissions summary and general conformity analysis (40 CFR Part 51 and 93, Section III.A). Emissions presented in the table are limited those generated by haul trucks, which would occur in federally designated CO maintenance area.

Sacramento Federal Nonattainment Area

As shown in Table 22-23, implementation of Alternative 1A (and thus Alternative 2A), would exceed the following SFNA federal *de minimis* thresholds:

- ROG: 2023–2027
- NO_X: 2018–2028
- PM10: 2023–2024

ROG and NO_X are precursors to ozone and NO_X is a precursor to PM, for which the SFNA is in nonattainment for the NAAQS. Sacramento County is also a maintenance area for the PM10 NAAQS. Since project emissions exceed the federal *de minimis* thresholds for ROG, NO_X, and PM10, a general conformity determination must be made to demonstrate that total direct and indirect emissions of

ROG, NO_X, and PM10would conform to the appropriate SFNA SIP for each year of construction in which the *de minimis* thresholds are exceeded.

NO_X is also a precursor to PM and can contribute to PM formation. As discussed above, Sacramento County is currently designated maintenance for the PM10 NAAQS and portions of the SVAB are designated nonattainment for the PM2.5 NAAQS. NO_X emissions in excess of 100 tons per year in Sacramento County trigger a secondary PM10 precursor threshold, whereas NO_X emissions in excess of 100 tons per year in the SVAB trigger a secondary PM2.5 precursor threshold. Since NO_X emissions can contribute to PM formation, NO_X emissions in excess of these secondary precursor thresholds could conflict with the applicable PM10 and PM2.5 SIPs. Accordingly, NO_X offsets pursued for the purposes of general conformity for those years in which NO_X emissions exceed 100 tons must occur within the federally designated PM2.5 nonattainment and PM10 maintenance areas of the SVAB.

As shown in Table 22-12, NO_X emissions generated by construction activities in SMAQMD (Sacramento County) would exceed 100 tons per year between 2022 and 2027. The project therefore triggers the secondary PM10 precursor threshold, requiring all NO_X offsets for 2022 through 2027 to occur within Sacramento County. The project also triggers the secondary PM2.5 precursor threshold in 2021, requiring all NO_X offsets for 2021 to occur within the federally designated PM2.5 nonattainment area within the SFNA. The nonattainment boundary for PM2.5 includes all of Sacramento County and portions of Yolo, El Dorado, Solano, and Placer counties.

Given the magnitude of NO_X emissions and the limited geographic scope available for offsets in 2022 through 2027 (Sacramento County), neither Mitigation Measures AQ-1a nor 1b could feasibly reduce NO_X emissions to net zero for the purposes of general conformity.[31] This impact would be adverse. In the event that Alternative 2A is selected as the APA, Reclamation, USFWS, and NMFS would need to demonstrate that conformity is met for NO_X and secondary PM10 formation through a local air quality modeling analysis (i.e., dispersion modeling) or other acceptable methods to ensure project emissions do not cause or contribute to any new violations of the NAAQS or increase the frequency or severity of any existing violations.

Mitigation Measure AQ-1a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-1a under Impact AQ-1 in the discussion of Alternative 1A.

[31] The secondary PM precursor thresholds are triggered through the General Conformity Regulation (40 CFR 93.153 (a)(1)). Accordingly, confinement of the geographic scope for available offsets only applies to the General Conformity determination and does not influence mitigation feasibility for Impacts AQ-1 or AQ-28.

Mitigation Measure AQ-1b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-1b under Impact AQ-1 in the discussion of Alternative 1A.

San Joaquin Valley Air Basin

As shown in Table 22-65, implementation of Alternative 2A would exceed the following SJVAB federal *de minimis* thresholds:

- ROG: 2019–2025
- NO_X: 2019–2026

ROG and NO_X are precursors to ozone and NO_X is a precursor to PM, for which the SJVAB is in nonattainment for the NAAQS. Since project emissions exceed the federal *de minimis* threshold for ROG and NO_X, a general conformity determination must be made to demonstrate that total direct and indirect emissions of ROG and NO_X would conform to the appropriate SJVAB SIP for each year of construction in which the *de minimis* thresholds are exceeded.

NO_X is also a precursor to PM and can contribute to PM formation. As discussed above, the SJVAB is currently designated maintenance for the PM10 NAAQS and nonattainment for the PM2.5 NAAQS. NO_X emissions in excess of 100 tons per year trigger a secondary PM precursor threshold, and could conflict with the applicable PM10 and PM2.5 SIPs. As shown in Table 22-65, NO_X emissions generated by construction activities in the SJVAB would exceed 100 tons per year between 2020 and 2024. NO_X offsets pursued for the purposes of general conformity for those years in which NO_X emissions exceed 100 tons must occur within the federally designated PM2.5 nonattainment and PM10 maintenance areas of the SJVAB, which are consistent with the larger nonattainment boundary for ozone.

As shown in Appendix 22E, *General Conformity Determination,* Attachment 22E-1, SJVAPCD confirms that sufficient emissions reduction credits would be available to fully offset ROG and NO_X emissions in excess of the federal *de minimis* thresholds zero through implementation of Mitigation Measures AQ-4a and 4b. Mitigation Measures AQ-4a and 4b will ensure the requirements of the mitigation and offset program are implemented and conformity requirements for ROG and NO_X are met, should Alternative 2A be selected as the APA.

Mitigation Measure AQ-4a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4a under Impact AQ-4 in the discussion of Alternative 1A.

Mitigation Measure AQ-4b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4b under Impact AQ-4 in the discussion of Alternative 1A.

San Francisco Bay Area Air Basin

As shown in Table 22-23, implementation of the Alternative 1A (and thus Alternative 2A) would not exceed any of the SFBAAB federal *de minimis* thresholds. Accordingly, a general conformity determination is not required as total direct and indirect emissions would conform to the appropriate SFBAAB SIPs.

CEQA Conclusion**:** SFNA and SJVAB are classified as nonattainment or maintenance areas with regard to the ozone and PM10 NAAQS, and the impact of increases in criteria pollutant emissions above the air basin *de minimis* thresholds could conflict with or obstruct implementation of the applicable air quality plans. Since construction emissions in the SFNA and SJVAB would exceed the *de minimis* thresholds for ROG, NO_X, and PM10 (SFNA only), this impact would be significant.

Mitigation Measures AQ-4a and AQ-4b would ensure project emissions would not result in an increase in regional ROG or NO_X in the SJVAB. These measures would therefore ensure total direct and indirect ROG and NO_X emissions generated by the project would conform to the appropriate SJVAB SIPs by offsetting the action's emissions in the same or nearby area to net zero. Accordingly, impacts would be less than significant with mitigation in the SJVAB.

Although Mitigation Measures AQ-1a and AQ-1b would reduce NO_X in the SFNA, given the magnitude of NO_X emissions and the limited geographic scope available for offsets (Sacramento County), neither measure could feasibly reduce NO_X emissions to net zero for the purposes of general conformity. This impact would be significant and unavoidable in the SFNA.

Emissions generated within the SFBAAB would not exceed the SFBAAB de minimis thresholds and would therefore conform to the appropriate SFBAAB SIPs. No mitigation is required.

Impact AQ-21: Generation of Cumulative Greenhouse Gas Emissions during Construction of the Proposed Water Conveyance Facility

NEPA Effects: GHG emissions generated by construction of Alternative 2A would be similar to emissions generated for Alternative 1A (see Table 22-25). However, because Alternative 2A includes an operable barrier at head of Old River, total emissions associated with Alternative 2A would be slightly higher than Alternative 1A. Table 22-66 summarizes GHG emissions associated with Alternative 2A. Emissions with are presented with implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*) and state mandates to reduce GHG emissions.

Table 22-66. GHG Emissions from Construction of Alternative 2A (metric tons/year)[a]

Year	Equipment and Vehicles (CO_2e)	Electricity (CO_2e)	Concrete Batching (CO_2)	Total CO_2e
2016	0	0	577	577
2017	0	0	0	0

2018	12,534	649	71,664	84,847
2019	46,452	3,625	11,256	61,334
2020	80,608	17,414	69,945	167,967
2021	120,912	46,364	138,729	306,005
2022	145,494	65,106	210,265	420,866
2023	188,505	57,956	205,289	451,751
2024	209,729	60,453	245,610	515,792
2025	142,041	40,781	164,006	346,828
2026	109,805	14,559	39,302	163,667
2027	84,144	2,781	56,679	143,605
2028	30,837	73	11,151	42,062
2029	1,300	2	0	1,302
Total	*1,172,362*	*309,765*	*1,224,476*	*2,706,602*

[a] Emissions estimates do not account for GHG flux from land disturbance. Surface and subsurface (e.g., tunneling) activities may oxidize peat soils, releasing GHG emissions. However, recent geotechnical surveys indicated that peat is negligible below 80 feet of depth. The tunnel will be placed below this range and the design adjusted if peat soils are discovered. Peat material encountered during surface excavation for non-tunnel work will be covered with top soil to reduce oxidation when needed.

Values may not total correctly due to rounding.

Table 22-26 summarizes GHG emissions that would be generated in the BAAQMD, SMAQMD, and YSAQMD. The head of Old River barrier would be constructed within the SJVAPCD under Alternative 2A. Table 22-67 summarizes GHG emissions that would be generated in the SJVAPCD. The table does not include emissions from electricity generation as these emissions would be generated by power plants located throughout the state (see discussion preceding this impact analysis). GHG emissions presented in Tables 22-26 and 22-67 are therefore provided for information purposes only.

Table 22-67. GHG Emissions from Construction of Alternative 2A by Air District (metric tons/year)[a]

Year	Equipment and Vehicles (CO_2e)	Concrete Batching (CO_2)[a]	Total CO_2e[b]
SMAQMD	533,894	734,685	1,268,580
YSAQMD	61,772	0	61,772
SJVAPCD	359,734	244,895	604,629
BAAQMD	216,962	244,895	461,857

[a] Emissions assigned to each air district based on the number of batching plants located in that air district.
[b] Values may not total correctly due to rounding.

As shown in Table 22-66, construction of Alternative 2A would generate a total of 2.7 million metric tons of GHG emissions. This is equivalent to adding 569,000 typical passenger vehicles to the road during construction (U.S. Environmental Protection Agency 2014e). As discussed in section 22.3.2, *Determination of Effects*, any increase in emissions above net zero associated with construction of the BDCP water conveyance features would be adverse. Accordingly, this effect would be adverse. Mitigation Measure AQ-21, which would develop a GHG Mitigation Program to reduce construction-related GHG emissions to net zero, is available address this effect.

***CEQA Conclusion*:** Construction of Alternative 2A would generate a total of 2.7 million metric tons of GHG emissions. As discussed in section 22.3.2, *Determination of Effects*, any increase in emissions above net zero associated with construction of the BDCP water conveyance features would be significant. Mitigation Measure AQ-21 would develop a GHG Mitigation Program to reduce construction-related GHG emissions to net zero. Accordingly, this impact would be less-than-significant with implementation of Mitigation Measure AQ-21.

Mitigation Measure AQ-21: Develop and Implement a GHG Mitigation Program to Reduce Construction Related GHG Emissions to Net Zero (0)

Please see Mitigation Measure AQ-21 under Impact AQ-21 in the discussion of Alternative 1A.

Impact AQ-22: Generation of Cumulative Greenhouse Gas Emissions from Operation and Maintenance of the Proposed Water Conveyance Facility and Increased Pumping

NEPA Effects: Operation of Alternative 2A would generate direct and indirect GHG emissions. Sources of direct emissions include heavy-duty equipment, on road crew trucks, and employee vehicle traffic. Indirect emissions would be generated predominantly by electricity consumption required for pumping as well as, maintenance, lighting, and other activities.

Table 22-68 summarizes long-term operational GHG emissions associated with operations, maintenance, and increased SWP pumping. Emissions were quantified for both ELT and LET conditions, although activities would take place annually until project decommissioning. Emissions include state mandates to reduce GHG emissions (described in Impact AQ-21) are presented (there are no BDCP specific operational environmental commitments). Total CO_2e emissions are compared to both the No Action Alternative (NEPA point of comparison) and Existing Conditions (CEQA baseline). As discussed in Section 22.3.1.2, equipment emissions are assumed to be zero under both the No Action Alternative (NEPA point of comparison) and Existing Conditions (CEQA baseline). The equipment emissions presented in Table 22-67 are therefore representative of project impacts for both the NEPA and CEQA analysis.

Table 22-68. GHG Emissions from Operation, Maintenance, and Increased SWP Pumping, Alternative 2A (metric tons/year)

Condition	Equipment CO_2e	Electricity CO_{2e}		Total CO_2e	
		NEPA Point of Comparison	CEQA Baseline	NEPA Point of Comparison	CEQA Baseline
ELT	562	-	111,643	-	112,205
LLT	548	25,621	4,984	26,169	5,532

Note: The *NEPA point of comparison* compares total CO_2e emissions after implementation of Alternative 2A to the No Action Alternative, whereas the *CEQA baseline* compares total CO_2e emissions to Existing Conditions.

Table 22-27 summarizes equipment CO_2e emissions that would be generated in the BAAQMD, SMAQMD, and YSAQMD. The head of Old River barrier would be constructed within the SJVAPCD under Alternative 2A. Table 22-70 summarizes equipment CO_2e associated with operational activities in SJVAPCD. The table does not include emissions from SWP pumping as these emissions would be generated by power plants located throughout the state (see discussion preceding this impact analysis). GHG emissions presented in Tables 22-27 and 22-69 are therefore provided for information purposes only.

Table 22-69. Equipment CO_2e Emissions from Operation and Maintenance of Alternative 2A in SJVAPCD (metric tons/year)[a]

Air District	ELT	LLT
SJVAPCD	32	32

[a] Emissions do not include emissions generated by increased SWP pumping.

SWP Operational and Maintenance GHG Emissions Analysis

Alternative 2A would add approximately 1,234 GWh[32] of additional net electricity demand to operation of the SWP each year assuming 2060 conditions. Conditions at 2060 (LLT) are used for this analysis because they yield the largest potential additional net electricity requirements and therefore represent the largest potential impact. This 1,234 GWh is based on assumptions of future conditions and operations and includes all additional energy required to operate the project with BDCP Alternative 2A including any additional energy associated with additional water being moved through the system.

In the CAP, DWR developed estimates of historical, current, and future GHG emissions. Figure 22-9 shows those emissions as they were projected in the CAP and how those emissions projections would change with the additional electricity demands needed to operate the SWP with the addition of BDCP Alternative 2A. As shown in Figure 22-9, in 2024, the year BDCP Alternative 2A is projected to go online, DWR total emissions jump from around 912,000 metric tons of CO_2e to nearly 1.5 million metric tons of CO_2e. This elevated level is approximately 200,000 metric tons of CO_2e above DWR's designated GHG emissions reduction trajectory (red line, which is the linear interpolation between DWR's 2020 GHG emissions goal and DWR's 2050 GHG emissions goal.) The projection indicates that after the initial jump in emissions, existing GHG emissions reduction measures would bring the elevated GHG emissions level back down below DWR's GHG emissions reduction trajectory by 2038 and that DWR would still achieve its GHG emission reduction goal by 2050.

Because employing only DWR's existing GHG emissions reduction measures would result in a large initial increase in emissions and result in DWR emissions exceeding the emissions reduction trajectory for several years, DWR will take additional actions to reduce GHG emissions if BDCP Alternative 2A is implemented.

The CAP sets forth DWR's plan to manage its activities and operations to achieve its GHG emissions reduction goals. The CAP commits DWR to monitoring its emissions each year and evaluating its emissions every five years to determine whether it is on a trajectory to achieve its GHG emissions reduction goals. If it appears that DWR will not meet the GHG emission reduction goals established in the plan, DWR may make adjustments to existing emissions reduction measures, devise new measures to ensure achievement of the goals, or take other action. Given the scale of additional

[32] Estimated net energy demand differs slightly from what is presented in Chapter 21, *Energy*. This is because the above analysis includes energy needed for transmission and distribution of water along the Valley String, which is required to enable a comparison with the assumptions in DWR's CAP.

emissions that BDCP Alternative 2A would add to DWR's total GHG emissions, DWR has evaluated the most likely method that it would use to compensate for such an increase in GHG emissions: modification of DWR's REPP. The DWR REPP (GHG emissions reduction measure OP-1 in the CAP) describes the amount of additional renewable energy that DWR expects to purchase each year to meet its GHG emissions reduction goals. The REPP lays out a long-term strategy for renewable energy purchases, though actual purchases of renewable energy may not exactly follow the schedule in the REPP and will ultimately be governed by actual operations, measured emissions, and contracting.

Table 22-70 below shows how the REPP could be modified to accommodate BDCP Alternative 2A, and shows that additional renewable energy resources could be purchased during years 2022–2025 over what was programmed in the original REPP. The net result of this change is that by 2026 DWR's energy portfolio would contain nearly 1,300 GWh of renewable energy (in addition to hydropower generated at SWP facilities). This amount is considerably larger than the amount called for in the original DWR REPP (1,292 compared to 792). In later years, 2031–2050, DWR would bring on slightly fewer additional renewable resources than programmed in the original REPP; however, almost 2,200 additional GWh of electricity would be purchased under the modified REPP during the 40 year period 2011–2050 then under the original REPP. Figure 22-10 shows how this modified Renewable Energy Procurement Plan would affect DWR's projected future emissions with BDCP Alternative 2A.

Table 22-70. Changes in Expected Renewable Energy Purchases 2011–2050 (Alternative 2A)

	Additional GWh of Renewable Power Purchased (Above previous year)	
Year(s)	Original CAP	New CAP
2011–2020	36	36
2021	72	72
2022–2025	72	197
2026–2030	72	72
2031–2040	108	58
2041–2050	144	59
Total Cumulative	52,236	54,411

As shown in the analysis above and consistent with the analysis contained in the CAP and associated Initial Study and Negative Declaration for the CAP, BDCP Alternative 2A would not adversely affect DWR's ability to achieve the GHG emissions reduction goals set forth in the CAP. Further, Alternative 2A would not conflict with any of DWR's specific action GHG emissions reduction measures and implements all applicable project level GHG emissions reduction measures as set forth in the CAP. BDCP Alternative 2A is therefore consistent with the analysis performed in the CAP. There would be no adverse effect.

***CEQA Conclusion*:** SWP GHG emissions currently are below 1990 levels and achievement of the goals of the CAP means that total DWR GHG emissions will be reduced to 50% of 1990 levels by 2020 and to 80% of 1990 levels by 2050. The implementation of BDCP Alternative 2A would not affect DWR's established emissions reduction goals or baseline (1990) emissions and therefore would not result in a change in total DWR emissions that would be considered significant. Prior adoption of the CAP by DWR already provides a commitment on the part of DWR to make all necessary modifications to DWR's REPP (as described above) or any other GHG emission reduction measure in the CAP that are necessary to achieve DWR's GHG emissions reduction goals. Therefore no amendment to the approved CAP is necessary to ensure the occurrence of the additional GHG emissions reduction activities needed to account for BDCP-related operational emissions. The effect of BDCP Alternative 2A with respect to GHG emissions is less than cumulatively considerable and therefore less than significant. No mitigation is required.

Impact AQ-23: Generation of Cumulative Greenhouse Gas Emissions from Increased CVP Pumping as a Result of Implementation of CM1

NEPA Effects: As previously discussed, DWR's CAP cannot be used to evaluate environmental impacts associated with increased CVP pumping, as emissions associated with CVP are not under DWR's control and are not included in the CAP. Accordingly, GHG emissions resulting from increased CVP energy use are evaluated separately from GHG emissions generated as a result of SWP energy use.

Under Alternative 2A, operation of the CVP yields the generation of clean, GHG emissions-free, hydroelectric energy. This electricity is sold into the California electricity market or directly to energy users. Analysis of the No Action Alternative indicates that the CVP generates and will continue to generate all of the electricity needed to operate the CVP system and approximately 3,500 GWh of excess hydroelectric energy that would be sold to energy users throughout California. Implementation of Alternative 2A, however, would result in an increase of 103 GWh in the demand for CVP generated electricity, which would result in a reduction of 103 GWh or electricity available for sale from the CVP to electricity users. This reduction in the supply of GHG emissions-free electricity to the California electricity users could result in a potential indirect effect of the project, as these electricity users would have to acquire substitute electricity supplies that may result in GHG emissions (although additional conservation is also a possible outcome as well).

It is unknown what type of power source (e.g., renewable, natural gas) would be substituted for CVP electricity or if some of the lost power would be made up with higher efficiency. Given State mandates for renewable energy and incentives for energy efficiency, it is possible that a considerable amount of this power would be replaced by renewable resources or would cease to be needed as a result of higher efficiency. However, to ensure a conservative analysis, indirect emissions were quantified for the entire quantity of electricity (103 GWh) using the current and future statewide energy mix (adjusted to reflect RPS) (please refer to Appendix 22A, *Air Quality Analysis Methodology,* for additional detail on quantification methods).

Substitution of 103 GWh of electricity with a mix of sources similar to the current statewide mix would result in emissions of 28,851 metric tons of CO_2e; however, under expected future conditions (after full implementation of the RPS), emissions would be 22,419 metric tons of CO_2e.

Use of CVP hydroelectricity to meet increased electricity demand from operation of CVP facilities associated with Alternative 2A would reduce available CVP hydroelectricity to other California electricity users. Substitution of the lost electricity with electricity from other sources could indirectly result in an increase of GHG emissions that is comparable or larger than the level of GHG emissions that trigger mandatory GHG reporting for major facilities. As a result, these emissions could contribute to a cumulatively considerable effect and are therefore adverse. However, these emissions would be caused by dozens of independent electricity users, who had previously bought CVP power, making decisions about different ways to substitute for the lost power. These decisions are beyond the control of Reclamation or any of the other BDCP Lead Agencies. Further, monitoring to determine the actual indirect change in emissions as a result of BDCP actions would not be feasible. In light of the impossibility of predicting where any additional emissions would occur, as well as Reclamation's lack of regulatory authority over the purchasers of power in the open market, no workable mitigation is available or feasible.

CEQA Conclusion**:** Operation of the CVP is a federal activity beyond the control of any State agency such as DWR, and the power purchases by private entities or public utilities in the private marketplace necessitated by a reduction in available CVP-generated hydroelectric power are beyond the control of the State, just as they are beyond the control of Reclamation. For these reasons, there are no feasible mitigation measures that could reduce this potentially significant indirect impact, which is solely attributable to operations of the CVP and not the SWP, to a less than significant level. This impact is therefore determined to be significant and unavoidable.

Impact AQ-24: Generation of Regional Criteria Pollutants from Implementation of CM2–CM11

NEPA Effects: Table 22-29 summarizes potential construction and operational emissions that may be generated by implementation of CM2–CM11. See the discussion of Impact AQ-24 under Alternative 1A.

Criteria pollutants from restoration and enhancement actions could exceed applicable general conformity *de minimis* levels and applicable local thresholds. The effect would vary according to the equipment used in construction of a specific conservation measure, the location, the timing of the actions called for in the conservation measure, and the air quality conditions at the time of implementation; these effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. The effect of increases in emissions during implementation of CM2–CM11 in excess of applicable general conformity *de minimis* levels and air district regional thresholds (Table 22-8) could violate air basin SIPs and worsen existing air quality conditions. Mitigation Measure AQ-24 would be available to reduce this effect, but emissions would still be adverse.

CEQA Conclusion**:** Construction and operational emissions associated with the restoration and enhancement actions would result in a significant impact if the incremental difference, or increase, relative to Existing Conditions exceeds the applicable local air district thresholds shown in Table 22-8; these effects are expected to be further evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measure AQ-24 would be available to reduce this effect, but may not be sufficient to reduce emissions below applicable air quality management district thresholds (see Table 22-8). Consequently, this impact would be significant and unavoidable.

Mitigation Measure AQ-24: Develop an Air Quality Mitigation Plan (AQMP) to Ensure Air District Regulations and Recommended Mitigation are Incorporated into Future Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-24 under Impact AQ-24 in the discussion of Alternative 1A.

Impact AQ-25: Exposure of Sensitive Receptors to Health Hazards from Localized Particulate Matter, Carbon Monoxide, and Diesel Particulate Matter from Implementation of CM2–CM11

NEPA Effects: The potential for Alternative 2A to expose sensitive receptors increased health hazards from localized PM, CO, and DPM would be similar to Alternative 1A. Activities shown in

Table 22-29 with the greatest potential to have short or long-term air quality impacts are also anticipated to have the greatest potential to expose receptors to substantial pollutant concentrations. The effect would vary according to the equipment used, the location and timing of the actions called for in the conservation measure, the meteorological and air quality conditions at the time of implementation, and the location of receptors relative to the emission source. Potential health effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions.

The effect of increases in PM, CO, or DPM (cancer and non-cancer-risk) in excess of applicable air district thresholds (Table 22-8) at receptor locations could result in adverse health impacts. Mitigation Measures AQ-24 and AQ-25 would be available to reduce this effect.

CEQA Conclusion**:** Construction and operational emissions associated with the restoration and enhancement actions under Alternative 2A would result in a significant impact if PM, CO, or DPM (cancer and non-cancer-risk) concentrations at receptor locations exceed the applicable local air district thresholds shown in Table 22-8; these effects are expected to be further evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measures AQ-24 and AQ-25 would ensure localized concentrations at receptor locations would be below applicable air quality management district thresholds (see Table 22-8). Consequently, this impact would be less than significant.

Mitigation Measure AQ-24: Develop an Air Quality Mitigation Plan (AQMP) to Ensure Air District Regulations and Recommended Mitigation are Incorporated into Future Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-24 under Impact AQ-24 in the discussion of Alternative 1A.

Mitigation Measure AQ-25: Prepare a Project-Level Health Risk Assessment to Reduce Potential Health Risks from Exposure to Localized DPM and PM Concentrations

Please see Mitigation Measure AQ-25 under Impact AQ-25 in the discussion of Alternative 1A.

Impact AQ-26: Creation of Potential Odors Affecting a Substantial Number of People from Implementation of CM2–CM11

NEPA Effects: The potential for Alternative 2A to expose sensitive receptors increased odors would be similar to Alternative 1A. Accordingly, construction activities associated with CM2–CM11 are not anticipated to result in nuisance odors. Similarly, while restored land uses associated with the program have the potential to generate odors from natural processes, the emissions would be similar in origin and magnitude to the existing land use types in the restored area (e.g., managed wetlands). Moreover, specific odor effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Accordingly, odor-related effects associated with CM2–CM11 would not be adverse.

CEQA Conclusion**:** Alternative 2A would not result in the addition of major odor producing facilities. Diesel emissions during construction could generate temporary odors, but these would quickly dissipate and cease once construction is completed. Increases in wetland, tidal, and upland habitats may increase the potential for odors from natural processes. However, the origin and magnitude of odors would be similar to the existing land use types in the restored area (e.g., managed wetlands). Moreover, specific odor impacts would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Accordingly, the impact of exposure of sensitive receptors to potential odors would be less than significant. No mitigation is required.

Impact AQ-27: Generation of Cumulative Greenhouse Gas Emissions from Implementation of CM2–CM11

NEPA Effects: CM2–CM11 implemented under Alternative 2A would result in local GHG emissions from construction equipment and vehicle exhaust, similar to Alternative 1A. Restoration activities with the greatest potential for emissions include those that break ground and require use of earthmoving equipment. The type of restoration action and related construction equipment use are shown in Table 22-29. Implementing CM2–CM11 would also affect long-term sequestration rates through land use changes, such as conversion of agricultural land to wetlands, inundation of peat soils, drainage of peat soils, and removal or planting of carbon-sequestering plants.

Without additional information on site-specific characteristics associated with each of the restoration components, a complete assessment of GHG flux from CM2–CM11 is currently not possible. The effect of carbon sequestration and CH_4 generation would vary by land use type, season, and chemical and biological characteristics; these effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measures AQ-18 and AQ-19 would be available to reduce this effect. However, due to the potential for increases in GHG emissions from construction and land use change, this effect would be adverse.

***CEQA Conclusion*:** The restoration and enhancement actions under Alternative 2A could result in a significant impact if activities are inconsistent with applicable GHG reduction plans, do not contribute to a lower carbon future, or generate excessive emissions, relative to other projects throughout the state. These effects are expected to be further evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measures AQ-24 and AQ-27 would be available to reduce this impact, but may not be sufficient to reduce to a less-than-significant level. Consequently, this impact would be significant and unavoidable.

Mitigation Measure AQ-24: Develop an Air Quality Mitigation Plan (AQMP) to Ensure Air District Regulations and Recommended Mitigation are Incorporated into Future Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-24 under Impact AQ-24 in the discussion of Alternative 1A.

Mitigation Measure AQ-27: Prepare a Land Use Sequestration Analysis to Quantify and Mitigate (as Needed) GHG Flux Associated with Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-27 under Impact AQ-27 in the discussion of Alternative 1A.

22.3.3.6 Alternative 2B—Dual Conveyance with East Alignment and Five Intakes (15,000 cfs; Operational Scenario B)

A total of five intakes would be constructed under Alternative 2B. For the purposes of this analysis, it was assumed that Intakes 1–5 or Intakes 1–3 and 6–7 would be constructed under Alternative 2B.

Under this alternative, an intermediate pumping plant would be constructed; the water conveyance facility would be a canal, and an operable barrier would be installed (Figures 3-4 and 3-5 in Chapter 3, *Description of Alternatives*).

Construction and operation of Alternative 2B would require the use of electricity, which would be supplied by the California electrical grid. Power plants located throughout the state supply the grid with power, which will be distributed to the Study area to meet project demand. Power supplied by statewide power plants will generate criteria pollutants. Because these power plants are located throughout the state, criteria pollutant emissions associated with Alternative 2B electricity demand cannot be ascribed to a specific air basin or air district within the Study area. Criteria pollutant emissions from electricity consumption are therefore provided for informational purposes only and are not included in the impact conclusion.

Electricity demand for construction of Alternative 2B would be to equal demand required for Alternative 1B. Electricity emissions generated by Alternative 1B would therefore be representative of emissions generated by Alternative 2B. Refer to Table 22-31 for a summary of electricity-related criteria pollutants during construction (years 2016 through 2029) of Alternative 1B that are applicable to this alternative. Operational emissions would be different from Alternative 1B and are provided in Table 22-71.

Table 22-71. Criteria Pollutant Emissions from Electricity Consumption: Net Project Operations, Alternative 2B (tons/year) [a,b]

Year	Analysis	ROG	CO	NO_X	PM10	PM2.5[c]	SO_2
ELT	CEQA	1	7	89	8	8	38
LLT	NEPA	1	13	178	15	15	75
LLT	CEQA	0	1	12	1	1	5

NEPA = Compares criteria pollutant emissions after implementation of Alternative 2B to the No Action Alternative.

CEQA = Compares criteria pollutant emissions after implementation of Alternative 2B to Existing Conditions.

[a] Emissions assume implementation of RPS (see Appendix 22A, *Air Quality Analysis Methodology*). Power plants that generate electricity for the proposed project would be subject to local air district permitting requirements, including standards to implement BACT to reduce criteria pollutant emissions.

[b] Because GHG emissions are cumulative (see Section 22.3.2.1) and not evaluated at the local air basin or air district level, they are discussed in Impacts AQ-21 and AQ-22. The GHG analysis for SWP power utilizes actual and forecasted GHG emissions rates for the SWP system, which differs slightly from the above analysis. Statewide grid average emission factors were utilized for the above analysis as criteria pollutant emission factors for SWP were unavailable. Please also note that the above analysis does not account for additional renewable energy that will be procured through modifications to DWR's REPP (see Impact AQ-22). Accordingly, the emissions results presented above represent a conservative assessment of potential criteria pollutant emissions.

[c] Emission factors for PM2.5 are currently unavailable. Consequently, PM2.5 emissions were assumed to equal PM10 emissions. Because PM2.5 represents a fraction of PM10, this approach represents a conservative assessment of PM2.5 emissions from electricity consumption.

Alternative 2B would comprise physical/structural components similar to those under Alternative 1B, but would entail an operable barrier along the San Joaquin separate fish movement corridor at the upstream confluence of Old River and the San Joaquin River (head of Old River). Emissions generated by construction of all features other than the head of Old River barrier under Alternative 1B would be representative of emissions generated by Alternative 2B (refer to Table 22-30).

The head of Old River barrier would be constructed within the SJVAPCD between 2022 and 2024. To ensure the emissions analysis within the SJVAPCD accurately evaluates all project components, construction emissions associated with the head of Old River barrier were quantified and added to the emissions estimates for the SJVAPCD under Alternative 1B. The resulting emissions are provided in Table 22-72. Exceedances of the air district thresholds are shown in underlined text.

Table 22-72. Criteria Pollutant Emissions from Construction of Alternative 2B within the SJVAPCD (tons/year)

Year	ROG	NO_X	CO	PM10			PM2.5			SO_2
				Exhaust	Dust	Total	Exhaust	Dust	Total	
2016	0	0	0	0	2	2	0	<1	<1	0
2017	0	0	0	0	0	0	0	0	0	0
2018	13	74	107	2	49	51	2	7	8	<1
2019	46	327	313	6	112	118	5	17	23	1
2020	30	256	174	5	49	54	5	8	13	1
2021	33	273	186	5	54	59	5	9	14	1
2022	22	169	123	3	39	42	3	6	9	<1
2023	13	88	92	1	32	33	1	5	6	<1
2024	11	75	76	1	26	27	1	4	5	<1
2025	1	5	5	<1	8	8	<1	1	1	<1
2026	<1	2	2	<1	3	3	<1	<1	0	<1
2027	<1	<1	1	<1	3	3	<1	<1	1	<1
2028	0	0	0	0	2	2	0	<1	<1	0
2029	0	0	0	0	0	0	0	0	0	0
Thresholds	10	10	-	-	-	15	-	-	15	-

Daily operation and maintenance activities under Alternative 2B would be the same as those generated under Alternative 1B (see Table 22-32). Yearly maintenance would be similar to those under Alternative 1B, but would also include annual inspections and sediment removal at the operable barrier in San Joaquin County. Table 22-73 summarizes annual criteria pollutant emissions associated with operation of Alternative 2B in the SJVAPCD.

Table 22-73. Criteria Pollutant Emissions from Operation of Alternative 2B in SJVAPCD (pounds per day and tons per year)

Condition	San Joaquin Valley Air Pollution Control District					
	ROG	NO_X	CO	PM10	PM2.5	SO_2
ELT	<0.01	0.01	0.02	<0.01	<0.01	<0.01
LLT	<0.01	0.01	0.01	<0.01	<0.01	<0.01
Thresholds	*10*	*10*	-	*15*	*15*	-

Impact AQ-1: Generation of Criteria Pollutants in Excess of the SMAQMD Regional Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: Construction activity required for Alternative 2B within the SMAQMD was assumed to equal activity required for Alternative 1B. Emissions generated by Alternative 1B would therefore be representative of emissions generated by Alternative 2B. As shown in Table 22-30, emissions would exceed SMAQMD's daily NO_X threshold, even with implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*). Since NO_X is a precursor to ozone and PM, exceedances of SMAQMD's daily NO_X threshold could impact both regional ozone and PM formation, which could worsen regional air quality and air basin attainment of the NAAQS and CAAQS.

While equipment could operate at any work area identified for this alternative, the highest level of NO_X and fugitive dust emissions in the SMAQMD are expected to occur at those sites where the duration and intensity of construction activities would be greatest. This includes all intake and intake pumping plant sites along the east bank of the Sacramento River. See the discussion of Impact AQ-1 under Alternative 1B.

Environmental commitments will reduce construction-related emissions; however, as shown in Table 22-31, NO_X emissions would still exceed SMAQMD's threshold identified in Table 22-8 and result in a regional adverse effect to air quality. Mitigation Measures AQ-1a and AQ-1b would be available to reduce NO_X emissions, and would thus address regional effects related to secondary ozone and PM formation.

***CEQA Conclusion*:** NO_X emissions generated during construction would exceed SMAQMD threshold identified in Table 22-8. Since NO_X is a precursor to ozone and PM, exceedances of SMAQMD's daily NO_X threshold could impact both regional ozone and PM formation. SMAQMD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS or NAAQS. The impact of generating NO_X emissions in excess of local air district thresholds would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. This impact would therefore be significant. Mitigation Measures AQ-1a and AQ-1b would be available to reduce NO_X emissions to a less-than-significant level by offsetting emissions to quantities below SMAQMD CEQA thresholds (see Table 22-8).

Mitigation Measure AQ-1a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-1a under Impact AQ-1 in the discussion of Alternative 1A.

Mitigation Measure AQ-1b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-1b under Impact AQ-1 in the discussion of Alternative 1A.

Impact AQ-2: Generation of Criteria Pollutants in Excess of the YSAQMD Regional Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: Construction activity required for Alternative 2B within the YSAQMD was assumed to equal activity required for Alternative 1B. Emissions generated by Alternative 1B would therefore be representative of emissions generated by Alternative 2B. As shown in Table 22-30, emissions would exceed YSAQMD's NO_X and PM10 thresholds, even with implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*).

Since NO_X is a precursor to ozone and PM, exceedances of SMAQMD's daily NO_X threshold could impact both regional ozone and PM formation, which could worsen regional air quality and air basin attainment of the NAAQS and CAAQS. Similarly, exceedances of YSAQMD's PM10 threshold could impede attainment of the NAAQS and CAAQS for PM10. All emissions generated within YSAQMD are a result of haul truck movement for equipment and material delivery.

Environmental commitments outlined in Appendix 3B, *Environmental Commitments,* will reduce construction-related emissions; however, as shown in Table 22-30, NO_X and PM10 emissions would still exceed the applicable YSAQMD thresholds identified in Table 22-8 and result in an adverse regional effect to air quality. Mitigation Measures AQ-1a and AQ-1b are available to reduce NO_X and PM10 emissions, and would thus address regional effects related to secondary ozone and PM formation.

***CEQA Conclusion*:** Emissions of NO_X and PM10 generated during construction would exceed YSAQMD's regional thresholds identified in Table 22-8. Since NO_X is a precursor to ozone and NO_X is a precursor to PM, exceedances of YSAQMD's NO_X threshold could impact both regional ozone and PM formation, which could worsen regional air quality and air basin attainment of the NAAQS and CAAQS. Similarly, exceedances of YSAQMD's PM10 threshold could impede attainment of the NAAQS and CAAQS for PM10. YSAQMD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS or NAAQS. The impact of generating NO_X and PM10 in excess of local air district regional thresholds would therefore violate applicable air quality standards in the study area and could contribute to or worsen an existing air quality conditions. This would be a significant impact. Mitigation Measures AQ-1a and AQ-1b would be available to reduce NO_X and PM10 emissions to a less-than-significant level by offsetting emissions to quantities below YSAQMD CEQA thresholds (see Table 22-8).

Mitigation Measure AQ-1a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-1a under Impact AQ-1 in the discussion of Alternative 1A.

Mitigation Measure AQ-1b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-1b under Impact AQ-1 in the discussion of Alternative 1A.

Impact AQ-3: Generation of Criteria Pollutants in Excess of the BAAQMD Regional Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: Construction activity required for Alternative 2B within the BAAQMD was assumed to equal activity required for Alternative 1B. Emissions generated by Alternative 1B would therefore be representative of emissions generated by Alternative 2B. As shown in Table 22-30, emissions would exceed BAAQMD's daily ROG and NO_X thresholds, even after implementation of environmental commitments. All other pollutants would be below air district thresholds and therefore would not result in an adverse air quality effect.

Since ROG and NO_X are precursors to ozone and NO_X is a precursor to PM, exceedances of BAAQMD's ROG and NO_X thresholds could impact both regional ozone and PM formation, which could worsen regional air quality and air basin attainment of the NAAQS and CAAQS.

While equipment could operate at any work area identified for this alternative, the highest level of ROG and NO_X emissions in the BAAQMD is expected to occur at those sites where the duration and intensity of construction activities would be greatest, including the site of the Byron Tract Forebay adjacent to and south of Clifton Court Forebay. See the discussion of Impact AQ-3 under Alternative 1B.

Environmental commitments outlined in Appendix 3B, *Environmental Commitments,* will reduce construction-related emissions; however, as shown in Table 22-30, ROG and NO_X emissions would still exceed the applicable air district thresholds identified in Table 22-8 and result in a regional adverse effect to air quality. Mitigation Measures AQ-3a and AQ-3b are available to reduce ROG and NO_X emissions, and would thus address regional effects related to secondary ozone and PM formation.

***CEQA Conclusion*:** Emissions of ROG and NO_X precursors generated during construction would exceed BAAQMD regional thresholds identified in Table 22-8. Since ROG and NO_X are precursors to ozone and NO_X is a precursor to PM, exceedances of BAAQMD's ROG and NO_X thresholds could impact both regional ozone and PM formation. The BAAQMD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS or NAAQS. The impact of generating ROG and NO_X emissions in excess of BAAQMD's regional thresholds would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. This would be a significant impact. Mitigation Measures AQ-3a and AQ-3b would be available to reduce NO_X emissions to a less-than-significant level.

Mitigation Measure AQ-3a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within BAAQMD/SFBAAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable BAAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-3a under Impact AQ-3 in the discussion of Alternative 1A.

Mitigation Measure AQ-3b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the BAAQMD/SFBAAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable BAAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-3b under Impact AQ-3 in the discussion of Alternative 1A.

Impact AQ-4: Generation of Criteria Pollutants in Excess of the SJVAPCD Regional Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: As shown in Table 22-72, emissions would exceed SJVAPCD's annual thresholds for the following years and pollutants, even with implementation of environmental commitments. All other pollutants would be below air district thresholds and therefore would not result in an adverse air quality effect.

- ROG: 2019–2022
- NO_X: 2018–2024
- PM10: 2018–2024
- PM2.5: 2019

Since ROG and NO_X are precursors to ozone and NO_X is a precursor to PM, exceedances of SJVAPCD's ROG and NO_X thresholds could impact both regional ozone and PM formation, which could worsen regional air quality and air basin attainment of the NAAQS and CAAQS. Similarly, exceedances of SJVAPCD's PM10 and PM2.5 thresholds could impede attainment of the NAAQS and CAAQS for PM.

While equipment could operate at any work area identified for this alternative, the highest level of ROG, NO_X, and PM emissions in the SJVAPCD are expected to occur at those sites where the duration and intensity of construction activities would be greatest. This includes all temporary and permanent utility sites, as well as the intermediate pumping plant and all construction sites along the east conveyance alignment. PM10 emissions would be highest in the vicinity of the concrete batch plants. For a map of the proposed east alignment, see Mapbook Figure M3-2.

Environmental commitments outlined in Appendix 3B, *Environmental Commitments,* will reduce construction-related emissions; however, as shown in Table 22-72, ROG, NO_X, PM10, and PM2.5 emissions would still exceed SJVAPCD's regional thresholds identified in Table 22-8 and result in an adverse effect to air quality. Mitigation Measures AQ-4a and AQ-4b are available to reduce ROG, NO_X, PM10, and PM2.5 emissions, and would thus address regional effects related to secondary ozone and PM formation.

***CEQA Conclusion*:** Emissions of ROG, NO_X, PM10, and PM2.5 generated during construction would exceed SJVAPCD's regional significance threshold identified in Table 22-8. Since ROG and NO_X are precursors to ozone and NO_X is a precursor to PM, exceedances of SJVAPCD's ROG and NO_X thresholds could impact both regional ozone and PM formation, which could worsen regional air quality and air basin attainment of the NAAQS and CAAQS. Similarly, exceedances of SJVAPCD's PM10 and PM2.5 thresholds could impede attainment of the NAAQS and CAAQS for PM10. The SJVAPCD's emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS or NAAQS. The impact of generating ROG, NO_X, PM10, and PM2.5 in excess of local air district thresholds would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. This would be a significant impact. Mitigation Measures AQ-4a and AQ-4b would be available to reduce emissions to a less-than-significant level.

Mitigation Measure AQ-4a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4a under Impact AQ-4 in the discussion of Alternative 1A.

Mitigation Measure AQ-4b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4b under Impact AQ-4 in the discussion of Alternative 1A.

Impact AQ-5: Generation of Criteria Pollutants in Excess of the SMAQMD Regional Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance activities in SMAQMD required for Alternative 2Bwere assumed to equal activities required for Alternative 1B. Emissions generated by Alternative 1B would therefore be representative of emissions generated by Alternative 2B. As shown in Table 22-32, emissions would not exceed SMAQMD's regional thresholds of significance and there would be no adverse effect. See the discussion of Impact AQ-6 under Alternative 1B.

***CEQA Conclusion*:** Emissions generated during operation and maintenance activities would not exceed SMAQMD thresholds for criteria pollutants. SMAQMD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS or NAAQS. The impact of generating emissions in excess of local air district would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Because project operations would not exceed SMAQMD regional thresholds, the impact would be less than significant. No mitigation is required.

Impact AQ-6: Generation of Criteria Pollutants in Excess of the YSAQMD Regional Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Construction of Alternative 2B would occur in the SMAQMD, SJVAPCD, and BAAQMD. No construction emissions would be generated in the YSAQMD. Consequently, construction of Alternative 2B would neither exceed the YSAQMD thresholds of significance nor result in an adverse effect to air quality.

***CEQA Conclusion*:** Construction emissions generated by the alternative would not exceed YSAQMD's thresholds of significance. This impact would be less than significant. No mitigation is required.

Impact AQ-7: Generation of Criteria Pollutants in Excess of the BAAQMD Regional Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance activities in BAAQMD required for Alternative 2B were assumed to equal activities required for Alternative 1B. Emissions generated by Alternative 1B would therefore be representative of emissions generated by Alternative 2B. As shown in Table 22-32, emissions would not exceed BAAQMD's regional thresholds of significance and there would be no adverse effect. See the discussion of Impact AQ-7 under Alternative 1B.

CEQA Conclusion: Emissions generated during operation and maintenance activities would not exceed BAAQMD regional thresholds for criteria pollutants. BAAQMD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS or NAAQS. The impact of generating emissions in excess of local air district thresholds would violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Because project operations would not exceed BAAQMD regional thresholds, the impact would be less than significant. No mitigation is required.

Impact AQ-8: Generation of Criteria Pollutants in Excess of the SJVAPCD Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance in SJVAPCD include annual inspections and sediment removal (see Appendix 22A, *Air Quality Analysis Methodology,* for additional detail). The highest concentration of operational emissions in the SJVPACD is expected at routine inspection sites along the east canal alignment and at the operable barrier. As shown in Table 22-72, operation and maintenance activities under Alternative 2B would not exceed SJVAPCD's regional thresholds of significance (see Table 22-8). Accordingly, project operations would not contribute to or worsen existing air quality exceedances. There would be no adverse effect.

CEQA Conclusion: Emissions generated during operation and maintenance activities would not exceed SJVAPCD's regional thresholds of significance. SJVAPCD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS or NAAQS. The impact of generating emissions in excess of local air district thresholds would violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Because project operations would not exceed SJVAPCD regional thresholds, the impact would be less than significant. No mitigation is required.

Impact AQ-9: Exposure of Sensitive Receptors to Health Hazards from Localized Particulate Matter in Excess of SMAQMD's Health-Based Concentration Thresholds

NEPA Effects: Construction activity required for Alternative 2B within the SMAQMD was assumed to equal activity required for Alternative 1B. Emissions and associated health risks from exposure to localized PM under Alternative 1B would therefore be representative of emissions and health risks generated by Alternative 2B.

As shown in Table 22-33, concentrations of annual PM10 and PM2.5 would be below the SMAQMD's significance thresholds. However, concentrations of PM10 would exceed SMAQMD's 24-hour PM10 threshold near intakes and intake work areas, even with implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*). Receptors exposed to PM10 concentrations in excess of SMAQMD's threshold could experience increased risk for adverse human health effects. Mitigation Measure AQ-9 is available to address this effect.

CEQA Conclusion: Respirable particulates pose a human health hazard by bypassing the defenses within the mucous ciliary system and entering deep lung tissue. Construction of Alternative 2B would result in the short-term exposure of receptors to PM10 concentrations that exceed SMAQMD threshold. This would be a significant impact. Mitigation Measure AQ-9 outlines a tiered strategy to reduce PM10 concentrations and public exposure to a less-than-significant level.

Mitigation Measure AQ-9: Implement Measures to Reduce Re-Entrained Road Dust and Receptor Exposure to PM2.5 and PM10

Please see Mitigation Measure AQ-9 under Impact AQ-9 in the discussion of Alternative 1A

Impact AQ-10: Exposure of Sensitive Receptors to Health Hazards from Localized Particulate Matter in Excess of YSAQMD's Health-Based Concentration Thresholds

NEPA Effects: Construction activity required for Alternative 2B within the YSAQMD was assumed to equal activity required for Alternative 1B. Emissions and associated health risks from exposure to localized PM under Alternative 1B would therefore be representative of emissions and health risks generated by Alternative 2B. As shown previously in Table 22-34, concentrations of particulate matter would not exceed YSAQMD's 24-hour and annual PM10 and PM2.5 thresholds and consequently would not result in an adverse effect to human health.

CEQA Conclusion**:** Respirable particulates pose a human health hazard by bypassing the defenses within the mucous ciliary system and entering deep lung tissue. Construction of Alternative 2B would result in PM2.5 and PM10 concentrations at receptor locations that are below the significance thresholds established by the YSAQMD. As such, localized particulate matter concentrations at analyzed receptors would not result in significant human health impacts. No mitigation is required.

Impact AQ-11: Exposure of Sensitive Receptors to Health Hazards from Localized Particulate Matter in Excess of BAAQMD's Health-Based Concentration Thresholds

NEPA Effects: Construction activity required for Alternative 2B within the BAAQMD was assumed to equal activity required for Alternative 1B. Emissions and associated health risks from exposure to localized PM under Alternative 1B would therefore be representative of emissions and health risks generated by Alternative 2B. As shown in Table 22-35, concentrations of particulate matter would not exceed BAAQMD's annual PM2.5 threshold and consequently would not result in an adverse effect to human health.

CEQA Conclusion**:** Respirable particulates pose a human health hazard by bypassing the defenses within the mucous ciliary system and entering deep lung tissue. Construction of Alternative 2B would result in PM2.5 concentrations at receptor locations that are below the significance thresholds established by the BAAQMD. As such, localized particulate matter concentrations at analyzed receptors would not result in significant human health impacts. No mitigation is required.

Impact AQ-12: Exposure of Sensitive Receptors to Health Hazards from Localized Particulate Matter in Excess of SJVAPCD's Health-Based Concentration Thresholds

NEPA Effects: The addition of the operational barrier in SJVAPCD would not generate additional construction emissions that would substantially affect sensitive receptors, relative to emissions associated with Alternative 1B. Accordingly, construction activity required for Alternative 2B within the SJVACPD was assumed to equal activity required for Alternative 1B. Emissions and associated health risks from exposure to localized PM under Alternative 1B would therefore be representative of emissions and health risks generated by Alternative 2B.

As shown in Table 22-36, concentrations of PM10 and PM2.5 would exceed SJVAPCD's 24-hour thresholds, even with implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*). Receptors exposed to PM10 and PM2.5 concentrations in excess of

SMAQMD's threshold could experience increased risk for adverse human health effects. Mitigation Measure AQ-9 is available to address this effect.

CEQA Conclusion**:** Respirable particulates pose a human health hazard by bypassing the defenses within the mucous ciliary system and entering deep lung tissue. Construction of Alternative 2B would result in the short-term exposure of receptors to PM10 and PM2.5 concentrations that exceed SJVAPCD threshold. This would be a significant impact. Mitigation Measure AQ-9 outlines a tiered strategy to reduce PM10 concentrations and public exposure to a less-than-significant level.

Mitigation Measure AQ-9: Implement Measures to Reduce Re-Entrained Road Dust and Receptor Exposure to PM2.5 and PM10

Please see Mitigation Measure AQ-9 under Impact AQ-9 in the discussion of Alternative 1A

Impact AQ-13: Exposure of Sensitive Receptors to Health Hazards from Localized Carbon Monoxide

NEPA Effects: Construction activity required for Alternative 2B would be similar to activity required for Alternative 1B. Accordingly, the potential for Alternative 2B to result in CO hot-spots during construction would be the same as Alternative 1B. Given that construction activities typically do not result in CO hot-spots, onsite concentrations must comply with OSHA standards, and CO levels dissipate as a function of distance, equipment-generated CO emissions (see Table 22-32) are not anticipated to result in adverse health hazards to sensitive receptors. Refer to Impact AQ-13 under Alternative 1B.

Traffic associated with construction may contribute to increase roadway congestion, which could lead to conditions conducive to CO hot-spot formation. As shown in Table 19-21, the highest peak hour traffic volumes under BPBGPP—11,968 vehicles per hour—would occur on westbound Interstate 80 between Suisun Valley Road and State Route 12. This is about half of the congested traffic volume modeled by BAAQMD (24,000 vehicles per hour) that would be needed to contribute to a localized CO hot-spot, and less than half of the traffic volume modeled by SMAQMD (31,600 vehicles per hour). Accordingly, construction traffic is not anticipated to result in adverse health hazards to sensitive receptors.

CEQA Conclusion: **Continuous engine exhaust may elevate localized CO concentrations. Receptors exposed to these CO "hot-spots" may have a greater likelihood of developing adverse health effects. Construction sites are less likely to result in localized CO hot-spots due to the nature of construction activities (Sacramento Metropolitan Air Quality Management District 2014), which normally utilize diesel-powered equipment for intermittent or short durations. Moreover, construction sites must comply with the OSHA CO exposure standards for onsite workers. Accordingly, given that construction activities typically do not result in CO hot-spots, onsite concentrations must comply with OSHA standards, and CO levels dissipate as a function of distance, equipment-generated CO emissions are not anticipated to result in significant health hazards to sensitive receptors. Similarly, peak-hour construction traffic on local roadways would not exceed BAAQMD's or SMAQMD's conservative screening criteria for the formation potential CO hot-spots. This impact would be less than significant. No mitigation is required.. Impact AQ-14: Exposure of Sensitive Receptors to Health Hazards from Diesel Particulate Matter in Excess of SMAQMD's Chronic Non-Cancer and Cancer Risk Thresholds**

NEPA Effects: Construction activity required for Alternative 2B within the SMAQMD was assumed to equal activity required for Alternative 1B. Emissions and resulting health risk generated by Alternative 1B would therefore be representative of emissions and health risk generated by Alternative 2B.

As shown in Table 22-37, Alternative 1B would not exceed the SMAQMD's chronic non-cancer or cancer thresholds and, thus, would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to DPM emissions and their health hazards during construction would not be adverse.

***CEQA Conclusion*:** DPM generated during construction poses inhalation-related chronic non-cancer hazard and cancer risk if nearby receptors are exposed to significant concentrations for prolonged durations. The DPM generated during Alternative 2B construction would not exceed the SMAQMD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this impact for DPM emissions would be less than significant. No mitigation is required.

Impact AQ-15: Exposure of Sensitive Receptors to Health Hazards from Diesel Particulate Matter in Excess of YSAQMD's Chronic Non-Cancer and Cancer Risk Thresholds

NEPA Effects: Construction activity required for Alternative 2B within the YSAQMD was assumed to equal activity required for Alternative 1B. Emissions and associated health risks from localized exposure to DPM under Alternative 1B would therefore be representative of emissions and health risks generated by Alternative 2B. As shown in Table 22-38, Alternative 1B would not exceed the YSAQMD's chronic non-cancer or cancer thresholds and, thus, would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to DPM emissions and their health hazards during construction would not be adverse.

***CEQA Conclusion*:** DPM generated during construction poses inhalation-related chronic non-cancer hazard and cancer risk if nearby receptors are exposed to significant concentrations for prolonged durations. The DPM generated during Alternative 2B construction would not exceed the YSAQMD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this impact for DPM emissions would be less than significant. No mitigation is required.

Impact AQ-16: Exposure of Sensitive Receptors to Health Hazards from Diesel Particulate Matter in Excess of BAAQMD's Chronic Non-Cancer and Cancer Risk Thresholds

NEPA Effects: Construction activity required for Alternative 2B within the BAAQMD was assumed to equal activity required for Alternative 1B. Emissions and associated health risks from exposure to localized DPM under Alternative 1B would therefore be representative of emissions and health risks generated by Alternative 2B. As shown in Table 22-39, Alternative 2B would not exceed the BAAQMD's chronic non-cancer or cancer thresholds and, thus, would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to DPM emissions and their health hazards during construction would not be adverse.

***CEQA Conclusion*:** DPM generated during construction poses inhalation-related chronic non-cancer hazard and cancer risk if nearby receptors are exposed to significant concentrations for prolonged durations. The DPM generated during Alternative 2B construction would not exceed the BAAQMD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this impact for DPM emissions would be less than significant. No mitigation is required.

Impact AQ-17: Exposure of Sensitive Receptors to Health Hazards from Diesel Particulate Matter in Excess of SJVAPCD's Chronic Non-Cancer and Cancer Risk Thresholds

NEPA Effects: The addition of the operational barrier in SJVAPCD would not generate additional construction emissions that would substantially affect sensitive receptors, relative to emissions associated with Alternative 1B. Accordingly, construction activity required for Alternative 2B within the SJVACPD was assumed to equal activity required for Alternative 1B. Emissions and associated health risks from localized exposure to DPM under Alternative 1B would therefore be representative of emissions and health risks generated by Alternative 2B.

As shown in Table 22-40, chronic risk under Alternative 1B would be below the SJVAPCD's significance thresholds. However, cancer risk would exceed SJVAPCD's cancer risk significance threshold, even with implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*). Therefore, this alternative's effect of exposure of sensitive receptors to DPM-related health hazards during construction would be adverse.

Mitigation Measure AQ-16 would be available to reduce exposure to substantial cancer risk by relocating affected receptors. Although Mitigation Measure AQ-16 would reduce the severity of this effect, the BDCP proponents are not solely responsible for implementation of the measure. If a landowner chooses not to accept DWR's offer of relocation assistance, an adverse effect in the form excess cancer risk above air district thresholds would occur. Therefore, this effect would be adverse. If, however, all landowners accept DWR's offer of relocation assistance, effects would not be adverse.

***CEQA Conclusion*:** DPM generated during construction poses inhalation-related chronic non-cancer hazard and cancer risk if adjacent receptors are exposed to significant concentrations for prolonged durations. The DPM generated during Alternative 2B construction would not exceed the SJVAPCD's chronic non-cancer hazard threshold; however, it would exceed the SJVAPCD's cancer threshold. Therefore, this impact would be significant.

Mitigation Measure AQ-16 would be available to reduce exposure to substantial cancer risk by relocating affected receptors. Although Mitigation Measure AQ-16 would reduce the severity of this effect, the BDCP proponents are not solely responsible for implementation of the measure. If a landowner chooses not to accept DWR's offer of relocation assistance, a significant impact in the form excess cancer risk above air district thresholds would occur. Therefore, this effect would be significant and unavoidable. If, however, all landowners accept DWR's offer of relocation assistance, the impact would be less than significant.

Mitigation Measure AQ-16: Relocate Sensitive Receptors to Avoid Excess Cancer Risk

Please see Mitigation Measure AQ-16 under Impact AQ-16 in the discussion of Alternative 1A

Impact AQ-18: Exposure of Sensitive Receptors to *Coccidioides immitis* (Valley Fever)

***NEPA Effects*:** As discussed under Alternative 1A, earthmoving activities during construction could release *C. immitis* spores if filaments are present and other soil chemistry and climatic conditions are conducive to spore development. Receptors adjacent to the construction area may therefore be exposed to increase risk of inhaling *C. immitis* spores and subsequent development of Valley Fever. Dust-control measures are the primary defense against infection (United States Geological Survey 2000). Implementation of advanced air-district recommended fugitive dust controls outlined in Appendix 3B, *Environmental Commitments*, would avoid dusty conditions and reduce the risk of contracting Valley Fever through routine watering and other controls. Therefore, this alternative's effect of exposure of sensitive receptors to increased Valley Fever risk during construction would not be adverse.

***CEQA Conclusion*:** Construction of the water conveyance facility would involve earthmoving activities that could release *C. immitis* spores if filaments are present and other soil chemistry and climatic conditions are conducive to spore development. Receptors adjacent to the construction area may therefore be exposed to increase risk of inhaling *C. immitis* spores and subsequent development of Valley Fever. Implementation of air-district recommended fugitive dust controls outlined in Appendix 3B, *Environmental Commitments*, would avoid dusty conditions and reduce the risk of contracting Valley Fever through routine watering and other controls. Therefore, this impact would be less than significant. No mitigation is required.

Impact AQ-19: Creation of Potential Odors Affecting a Substantial Number of People during Construction or Operation of the Proposed Water Conveyance Facility

NEPA Effects: As discussed under Alternative 1A, odors from construction activities would be localized and generally confined to the immediate area surrounding the construction site. Moreover, odors would be temporary and localized, and they would cease once construction activities have been completed. Thus, it is not anticipated that construction of CM1 would create objectionable odors from construction equipment or asphalt paving.

Construction of the water conveyance facility would require removal of subsurface material during tunnel excavation and sediment removal. As discussed under Alternative 1A, geotechnical tests indicate that VOC levels in Plan Area soils are below the method detection limits, indicating that organic decay of exposed RTM and sediment will be relatively low (URS 2014). Moreover, drying and stockpiling of the removed RTM and sediment will occur under aerobic conditions, which will further limit any potential decomposition and associated malodorous products. Accordingly, it is not anticipated that tunnel and sediment excavation would create objectionable odors.

Typical facilities known to produce odors include landfills, wastewater treatment plants, food processing facilities, and certain agricultural activities. Alternative 2B would not result in the addition of facilities associated with odors, and as such, long-term operation of the water conveyance facility would not result in objectionable odors.

***CEQA Conclusion*:** Alternative 2B would not result in the addition of major odor producing facilities. Diesel emissions during construction could generate temporary odors, but these would quickly dissipate and cease once construction is completed. Likewise, potential odors generated during asphalt paving would be addressed through mandatory compliance with air district rules and regulations. While tunnel excavation would unearth substantial quantities of RTM, geotechnical tests indicate that soils in the Plan Area have relatively low organic constituents. Moreover, drying and stockpiling of the removed RTM will occur under aerobic conditions, which will further limit any potential decomposition and associated malodorous products. Accordingly, the impact of exposure of sensitive receptors to potential odors during construction is therefore less than significant. No mitigation is required.

Impact AQ-20: Generation of Criteria Pollutants in the Excess of Federal *De Minimis* Thresholds from Construction and Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: As discussed above, emissions generated by Alternative 1B within the SFNA and SFBAAB would be representative of emissions generated by Alternative 2B (refer to Table 22-41). Due to the operable barrier at head of Old River, emissions within the SJVAB would be slightly higher than those quantified for Alternative 1B. To ensure the emissions analysis within the SJVAB accurately evaluates all project components, construction emissions associated with the head of Old River barrier were quantified and added to the emissions estimates for the SJVAB under Alternative 1B. The resulting emissions are provided in Table 22-74. Exceedances of the federal *de minimis* thresholds are shown in <u>underlined</u> text.

Table 22-74. Criteria Pollutant Emissions from Construction and Operation of Alternative 2B in Nonattainment and Maintenance Areas of the SJVAB (tons/year)

Year	ROG	NO_X[a]	CO[b]	PM10	PM2.5	SO_2
2016	0	0	0	2	<1	0
2017	0	0	0	0	0	0
2018	13	74	<1	51	8	<1
2019	46	327	<1	118	23	1
2020	30	256	<1	54	13	1
2021	33	273	<1	59	14	1
2022	22	169	<1	42	9	<1
2023	13	88	<1	33	6	<1
2024	11	75	<1	27	5	<1
2025	1	5	<1	8	1	<1
2026	<1	2	<1	3	<1	<1
2027	<1	<1	<1	3	1	<1
2028	0	0	0	2	0	0
2029	0	0	0	0	0	0
ELT	<0.01	0.01	0.02	<0.01	<0.01	<0.01
LLT	<0.01	0.01	0.01	<0.01	<0.01	<0.01
De Minimis	10	10	100	100	100	100

[a] NO_X emissions in excess of 100 tons per year within federally designated PM10 and PM2.5 nonattainment or maintenance areas trigger a secondary PM10 and PM2.5 precursor threshold. NO_X emissions in excess of this secondary threshold could conflict with the applicable PM10 and PM2.5 SIPs. Accordingly, NO_X offsets pursued for the purposes of general conformity for those years in which NO_X emissions exceed 100 tons must occur within the federally designated PM2.5 nonattainment and PM10 maintenance areas, as applicable.

[b] The proposed water conveyance facility is located within a federally designated CO attainment area. Accordingly, CO emissions generated by construction of CM1 are not subject to the General Conformity Rule and are excluded from the emissions summary and general conformity analysis (40 CFR Part 51 and 93, Section III.A). Emissions presented in the table are limited those generated by haul trucks, which would occur in federally designated CO maintenance area.

Sacramento Federal Nonattainment Area

As shown in Table 22-41, implementation of Alternative 1B (and thus Alternative 2B) would exceed the following SFNA federal *de minimis* thresholds:

- ROG: 2023–2024
- NO_X: 2018-2028
- PM10: 2024

ROG and NO_X are precursors to ozone and NO_X is a precursor to PM, for which the SFNA is in nonattainment for the NAAQS. Sacramento County is also a maintenance area for the PM10 NAAQS. Since project emissions exceed the federal *de minimis* thresholds for ROG, NO_X, and PM10, a general conformity determination must be made to demonstrate that total direct and indirect emissions of

ROG, NO_X, and PM10would conform to the appropriate SFNA SIP for each year of construction in which the *de minimis* thresholds are exceeded.

NO_X is also a precursor to PM and can contribute to PM formation. As discussed above, Sacramento County is currently designated maintenance for the PM10 NAAQS and portions of the SVAB are designated nonattainment for the PM2.5 NAAQS. NO_X emissions in excess of 100 tons per year in Sacramento County trigger a secondary PM10 precursor threshold, whereas NO_X emissions in excess of 100 tons per year in the SVAB trigger a secondary PM2.5 precursor threshold. Since NO_X emissions can contribute to PM formation, NO_X emissions in excess of these secondary precursor thresholds could conflict with the applicable PM10 and PM2.5 SIPs. Accordingly, NO_X offsets pursued for the purposes of general conformity for those years in which NO_X emissions exceed 100 tons must occur within the federally designated PM2.5 nonattainment and PM10 maintenance areas of the SVAB.

As shown in Table 22-31, NO_X emissions generated by construction activities in SMAQMD (Sacramento County) would exceed 100 tons per year between 2019 and 2027. The project therefore triggers the secondary PM10 precursor threshold, requiring all NO_X offsets for 2019 through 2027 to occur within Sacramento County.

Given the magnitude of NO_X emissions and the limited geographic scope available for offsets in 2019 through 2027 (Sacramento County), neither Mitigation Measures AQ-1a nor 1b could feasibly reduce NO_X emissions to net zero for the purposes of general conformity.[33] This impact would be adverse. In the event that Alternative 2B is selected as the APA, Reclamation, USFWS, and NMFS would need to demonstrate that conformity is met for NO_X and secondary PM10 formation through a local air quality modeling analysis (i.e., dispersion modeling) or other acceptable methods to ensure project emissions do not cause or contribute to any new violations of the NAAQS or increase the frequency or severity of any existing violations.

Mitigation Measure AQ-1a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-1a under Impact AQ-1 in the discussion of Alternative 1A.

Mitigation Measure AQ-1b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-1b under Impact AQ-1 in the discussion of Alternative 1A.

[33] The secondary PM precursor thresholds are triggered through the General Conformity Regulation (40 CFR 93.153 (a)(1)). Accordingly, confinement of the geographic scope for available offsets only applies to the General Conformity determination and does not influence mitigation feasibility for Impacts AQ-1 or AQ-28.

San Joaquin Valley Air Basin

As shown in Table 22-74, implementation of Alternative 2B would exceed SJVAB federal *de minimis* thresholds for the following pollutants and years.

- ROG: 2018–2024
- NO_X: 2018–2024
- PM10: 2019

ROG and NO_X are precursors to ozone, for which the SJVAB is in nonattainment for the NAAQS. Likewise, the SJVAB is current classified as a maintenance area for PM10. Since project emissions exceed the federal *de minimis* threshold for ROG, NO_X, and PM10, a general conformity determination must be made to demonstrate that total direct and indirect emissions would conform to the appropriate SJVAB SIPs for each year of construction for which the *de minimis* thresholds are exceed.

NO_X is also a precursor to PM and can contribute to PM formation. As discussed above, the SJVAB is currently designated maintenance for the PM10 NAAQS and nonattainment for the PM2.5 NAAQS. NO_X emissions in excess of 100 tons per year trigger a secondary PM precursor threshold, and could conflict with the applicable PM10 and PM2.5 SIPs. As shown in Table 22-74, NO_X emissions generated by construction activities in the SJVAB would exceed 100 tons per year between 2019 and 2022. NO_X offsets pursued for the purposes of general conformity for those years in which NO_X emissions exceed 100 tons must occur within the federally designated PM2.5 nonattainment and PM10 maintenance areas of the SJVAB, which are consistent with the larger nonattainment boundary for ozone

As shown in Appendix 22E, *General Conformity Determination,* Attachment 22E-1, SJVAPCD confirms that sufficient emissions reduction credits would be available to fully offset ROG, NO_X, and PM10 emissions in excess of the federal *de minimis* thresholds zero through implementation of Mitigation Measures AQ-4a and 4b. Mitigation Measures AQ-4a and 4b will ensure the requirements of the mitigation and offset program are implemented and conformity requirements for ROG, NO_X, and PM10 are met, should Alternative 2B be selected as the APA.

Mitigation Measure AQ-4a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4a under Impact AQ-4 in the discussion of Alternative 1A.

Mitigation Measure AQ-4b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4b under Impact AQ-4 in the discussion of Alternative 1A.

San Francisco Bay Area Air Basin

As shown in Table 22-41, implementation of the Alternative 1B (and thus Alternative 2B) would not exceed any of the SFBAAB federal *de minimis* thresholds. Accordingly, a general conformity determination is not required as total direct and indirect emissions of NO_X would conform to the appropriate SFBAAB SIPs.

***CEQA Conclusion*:** SFNA and SJVAB are classified as nonattainment or maintenance areas with regard to the ozone and PM10 NAAQS, and the impact of increases in criteria pollutant emissions above the air basin *de minimis* thresholds could conflict with or obstruct implementation of the applicable air quality plans. Since construction emissions in the SFNA and SJVAB would exceed the *de minimis* thresholds for ROG, NO_X, and PM10, this impact would be significant.

Mitigation Measures AQ-4a and AQ-4b would ensure project emissions would not result in an increase in regional ROG, NO_X, or PM10 in the SJVAB. These measures would therefore ensure total direct and indirect ROG, NO_X, and PM10 emissions generated by the project would conform to the appropriate SJVAB SIPs by offsetting the action's emissions in the same or nearby area to net zero. Accordingly, impacts would be less than significant with mitigation in the SJVAB.

Although Mitigation Measures AQ-1a and AQ-1b would reduce NO_X in the SFNA, given the magnitude of NO_X emissions and the limited geographic scope available for offsets (Sacramento County), neither measure could feasibly reduce NO_X emissions to net zero for the purposes of general conformity. This impact would be significant and unavoidable in the SFNA.

Emissions generated within the SFBAAB would not exceed the SFBAAB de minimis thresholds and would therefore conform to the appropriate SFBAAB SIPs. No mitigation is required.

Impact AQ-21: Generation of Cumulative Greenhouse Gas Emissions during Construction of the Proposed Water Conveyance Facility

NEPA Effects: GHG emissions generated by construction of Alternative 2B would be similar to emissions generated for Alternative 1B (see Table 22-42). However, because Alternative 2B includes an operable barrier at head of Old River, total emissions associated with Alternative 2B would be slightly higher than Alternative 1A due to additional equipment activity. Table 22-75 summarizes GHG emissions associated with Alternative 2B. Emissions with are presented with implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*) and state mandates to reduce GHG emissions.

Table 22-43 summarizes GHG emissions that would be generated in the BAAQMD, SMAQMD, and YSAQMD. The head of Old River barrier would be constructed within the SJVAPCD under Alternative 2B. Table 22-76 summarizes GHG emissions that would be generated in the SJVAPCD. The table does not include emissions from electricity generation as these emissions would be generated by power plants located throughout the state (see discussion preceding this impact analysis). GHG emissions presented in Tables 22-43 and 22-76 are therefore provided for information purposes only.

As shown in Table 22-75, construction of Alternative 2B would generate a total of 2.0 million metric tons of GHG emissions. This is equivalent to adding 427,000 typical passenger vehicles to the road during construction (U.S. Environmental Protection Agency 2014e). As discussed in section 22.3.2, *Determination of Effects*, any increase in emissions above net zero associated with construction of the BDCP water conveyance features would be adverse. Accordingly, this effect would be adverse.

Mitigation Measure AQ-21, which would develop a GHG Mitigation Program to reduce construction-related GHG emissions to net zero, is available address this effect.

CEQA Conclusion: Construction of Alternative 2B would generate a total of 2.0 million metric tons of GHG emissions. This is equivalent to adding 427,000 typical passenger vehicles to the road during construction (U.S. Environmental Protection Agency 2014e). As discussed in section 22.3.2, *Determination of Effects*, any increase in emissions above net zero associated with construction of the BDCP water conveyance features would be significant. Mitigation Measure AQ-21 would develop a GHG Mitigation Program to reduce construction-related GHG emissions to net zero. Accordingly, this impact would be less-than-significant with implementation of Mitigation Measure AQ-21.

Table 22-75. GHG Emissions from Construction of Alternative 2B (metric tons/year)[a]

Year	Equipment and Vehicles (CO_2e)	Electricity (CO_2e)	Concrete Batching (CO_2)	Total CO_2e
2016	0	0	409	409
2017	0	0	0	0
2018	56,832	185	50,761	107,777
2019	175,639	1,033	7,973	184,645
2020	106,574	4,960	49,542	161,077
2021	118,358	13,206	98,263	229,827
2022	104,853	18,545	148,933	272,331
2023	136,856	16,508	145,408	298,773
2024	152,885	17,220	173,968	344,072
2025	71,433	11,616	116,167	199,217
2026	61,396	4,147	27,838	93,382
2027	61,806	792	40,147	102,745
2028	27,294	21	7,899	35,214
2029	0	1	0	1
Total	*1,073,927*	*88,234*	*867,307*	*2,029,469*

[a] Emissions estimates do not account for GHG flux from land disturbance. Surface and subsurface (e.g., tunneling) activities may oxidize peat soils, releasing GHG emissions. However, recent geotechnical surveys indicated that peat is negligible below 80 feet of depth. The tunnel will be placed below this range and the design adjusted if peat soils are discovered. Peat material encountered during surface excavation for non-tunnel work will be covered with top soil to reduce oxidation when needed.

Values may not total correctly due to rounding.

Table 22-76. GHG Emissions from Construction of Alternative 2B by Air District (metric tons/year)[a]

Air District	Equipment and Vehicles (CO_2e)	Concrete Batching (CO_2)[a]	Total CO_2e[b]
SJVAPCD	400,705	433,654	834,358

[a] Emissions assigned to each air district based on the number of batching plants located in that air district.

[b] Values may not total correctly due to rounding.

Mitigation Measure AQ-21: Develop and Implement a GHG Mitigation Program to Reduce Construction Related GHG Emissions to Net Zero (0)

Please see Mitigation Measure AQ-21 under Impact AQ-21 in the discussion of Alternative 1A.

Impact AQ-22: Generation of Cumulative Greenhouse Gas Emissions from Operation and Maintenance of the Proposed Water Conveyance Facility and Increased Pumping

NEPA Effects: Operation of Alternative 2B would generate direct and indirect GHG emissions. Sources of direct emissions include heavy-duty equipment, on road crew trucks, and employee vehicle traffic. Indirect emissions would be generated predominantly by electricity consumption required for pumping as well as, maintenance, lighting, and other activities.

Table 22-77 summarizes long-term operational GHG emissions associated with operations, maintenance, and increased SWP pumping. Emissions were quantified for both ELT and LLT conditions, although activities would take place annually until project decommissioning. Emissions include state mandates to reduce GHG emissions (described in Impact AQ-21) are presented (there are no BDCP specific operational environmental commitments). Total CO_2e emissions are compared to both the No Action Alternative (NEPA point of comparison) and Existing Conditions (CEQA baseline). As discussed in Section 22.3.1.2, equipment emissions are assumed to be zero under both the No Action Alternative (NEPA point of comparison) and Existing Conditions (CEQA baseline). The equipment emissions presented in Table 22-77 are therefore representative of project impacts for both the NEPA and CEQA analysis.

Table 22-77. GHG Emissions from Operation, Maintenance, and Increased SWP Pumping, Alternative 2B (metric tons/year)

		Electricity CO_{2e}		Total CO_2e	
Condition	Equipment CO_2e	NEPA Point of Comparison	CEQA Baseline	NEPA Point of Comparison	CEQA Baseline
ELT	438	-	85,458	-	85,896
LLT	420	22,585	1,948	23,005	2,368

Note: The *NEPA point of comparison* compares total CO_2e emissions after implementation of Alternative 2B to the No Action Alternative, whereas the *CEQA baseline* compares total CO_2e emissions to Existing Conditions.

Table 22-45 summarizes equipment CO_2e emissions that would be generated in the BAAQMD and SMAQMD. The head of Old River barrier would be constructed within the SJVAPCD under Alternative 2B. Table 22-78 summarizes equipment CO_2e associated with operational activities in SJVAPCD. The table does not include emissions from SWP pumping as these emissions would be generated by power plants located throughout the state (see discussion preceding this impact analysis). GHG emissions presented in Tables 22-45 and 22-78 are therefore provided for information purposes only.

Table 22-78. Equipment CO_2e Emissions from Operation and Maintenance of Alternative 2B in SJVAPCD (metric tons/year)[a]

Air District	ELT	LLT
SJVAPCD	5	5

[a] Emissions do not include emissions generated by increased SWP pumping.

SWP Operational and Maintenance GHG Emissions Analysis

Alternative 2B would add approximately 1,078 GWh[34] of additional net electricity demand to operation of the SWP each year assuming 2060 conditions. Conditions at 2060 (LLT) are used for this analysis because they yield the largest potential additional net electricity requirements and therefore represent the largest potential impact. This 1,078 GWh is based on assumptions of future conditions and operations and includes all additional energy required to operate the project with BDCP Alternative 2B including any additional energy associated with additional water being moved through the system.

In the CAP, DWR developed estimates of historical, current, and future GHG emissions. Figure 22-11 shows those emissions as they were projected in the CAP and how those emissions projections would change with the additional electricity demands needed to operate the SWP with the addition of BDCP Alternative 2B. As shown in Figure 22-11, in 2024, the year BDCP Alternative 2B is projected to go online, DWR total emissions jump from around 912,000 metric tons of CO_2e to nearly 1.4 million metric tons of CO_2e. This elevated level is approximately 120,000 metric tons of CO_2e above DWR's designated GHG emissions reduction trajectory (red line, which is the linear interpolation between DWR's 2020 GHG emissions goal and DWR's 2050 GHG emissions goal.) The projection indicates that after the initial jump in emissions, existing GHG emissions reduction measures would bring the elevated GHG emissions level back down below DWR's GHG emissions reduction trajectory by 2035 and that DWR would still achieve its GHG emission reduction goal by 2050.

Because employing only DWR's existing GHG emissions reduction measures would result in a large initial increase in emissions and result in DWR emissions exceeding the emissions reduction trajectory for several years, DWR will take additional actions to reduce GHG emissions if BDCP Alternative 2B is implemented.

The CAP sets forth DWR's plan to manage its activities and operations to achieve its GHG emissions reduction goals. The CAP commits DWR to monitoring its emissions each year and evaluating its emissions every five years to determine whether it is on a trajectory to achieve its GHG emissions reduction goals. If it appears that DWR will not meet the GHG emission reduction goals established in the plan, DWR may make adjustments to existing emissions reduction measures, devise new measures to ensure achievement of the goals, or take other action. Given the scale of additional emissions that BDCP Alternative 2B would add to DWR's total GHG emissions, DWR has evaluated the most likely method that it would use to compensate for such an increase in GHG emissions:

[34] Estimated net energy demand differs slightly from what is presented in Chapter 21, *Energy*. This is because the above analysis includes energy needed for transmission and distribution of water along the Valley String, which is required to enable a comparison with the assumptions in DWR's CAP.

modification of DWR's REPP. The DWR REPP (GHG emissions reduction measure OP-1 in the CAP) describes the amount of additional renewable energy that DWR expects to purchase each year to meet its GHG emissions reduction goals. The REPP lays out a long-term strategy for renewable energy purchases, though actual purchases of renewable energy may not exactly follow the schedule in the REPP and will ultimately be governed by actual operations, measured emissions, and contracting.

Table 22-79 below shows how the REPP could be modified to accommodate BDCP Alternative 2B, and shows that additional renewable energy resources could be purchased during years 2022–2025 over what was programmed in the original REPP. The net result of this change is that by 2026 DWR's energy portfolio would contain nearly 1,042 GWh of renewable energy (in addition to hydropower generated at SWP facilities). This amount is considerably larger than the amount called for in the original DWR REPP (1,042 compared to 792). In later years, 2031–2050, DWR would bring on slightly fewer additional renewable resources than programmed in the original REPP. Figure 22-12 shows how this modified Renewable Energy Procurement Plan would affect DWR's projected future emissions with BDCP Alternative 2B.

Table 22-79. Changes in Expected Renewable Energy Purchases 2011–2050 (Alternative 2B)

	Additional GWh of Renewable Power Purchased (Above previous year)	
Year(s)	Original CAP	New CAP
2011–2020	36	36
2021	72	72
2022–2025	72	122
2026–2030	72	72
2031–2040	108	53
2041–2050	144	74
Total Cumulative	52,236	48,761

As shown in the analysis above and consistent with the analysis contained in the CAP and associated Initial Study and Negative Declaration for the CAP, BDCP Alternative 2B would not adversely affect DWR's ability to achieve the GHG emissions reduction goals set forth in the CAP. Further, Alternative 2B would not conflict with any of DWR's specific action GHG emissions reduction measures and implements all applicable project level GHG emissions reduction measures as set forth in the CAP. BDCP Alternative 2B is therefore consistent with the analysis performed in the CAP. There would be no adverse effect.

***CEQA Conclusion*:** SWP GHG emissions currently are below 1990 levels and achievement of the goals of the CAP means that total DWR GHG emissions will be reduced to 50% of 1990 levels by 2020 and to 80% of 1990 levels by 2050. The implementation of BDCP Alternative 2B would not affect DWR's established emissions reduction goals or baseline (1990) emissions and therefore would not result in a change in total DWR emissions that would be considered significant. Prior adoption of the CAP by DWR already provides a commitment on the part of DWR to make all necessary modifications to DWR's REPP (as described above) or any other GHG emission reduction measure in the CAP that are necessary to achieve DWR's GHG emissions reduction goals. Therefore no amendment to the approved CAP is necessary to ensure the occurrence of the additional GHG emissions reduction activities needed to account for BDCP-related operational emissions. The effect of BDCP Alternative 2B with respect to GHG emissions is less than cumulatively considerable and therefore less than significant. No mitigation is required.

Impact AQ-23: Generation of Cumulative Greenhouse Gas Emissions from Increased CVP Pumping as a Result of Implementation of CM1

NEPA Effects: As previously discussed, DWR's CAP cannot be used to evaluate environmental impacts associated with increased CVP pumping, as emissions associated with CVP are not under DWR's control and are not included in the CAP. Accordingly, GHG emissions resulting from increased CVP energy use are evaluated separately from GHG emissions generated as a result of SWP energy use.

Under Alternative 2B, operation of the CVP yields the generation of clean, GHG emissions-free, hydroelectric energy. This electricity is sold into the California electricity market or directly to energy users. Analysis of the No Action Alternative indicates that the CVP generates and will continue to generate all of the electricity needed to operate the CVP system and approximately 3,500 GWh of excess hydroelectric energy that would be sold to energy users throughout California. Implementation of Alternative 2B, however, would result in an increase of 103 GWh in the demand for CVP generated electricity, which would result in a reduction of 103 GWh or electricity available for sale from the CVP to electricity users. This reduction in the supply of GHG emissions-free electricity to the California electricity users could result in a potential indirect effect of the project, as these electricity users would have to acquire substitute electricity supplies that may result in GHG emissions (although additional conservation is also a possible outcome as well).

It is unknown what type of power source (e.g., renewable, natural gas) would be substituted for CVP electricity or if some of the lost power would be made up with higher efficiency. Given State mandates for renewable energy and incentives for energy efficiency, it is possible that a considerable amount of this power would be replaced by renewable resources or would cease to be needed as a result of higher efficiency. However, to ensure a conservative analysis, indirect emissions were quantified for the entire quantity of electricity (103 GWh) using the current and future statewide energy mix (adjusted to reflect RPS) (please refer to Appendix 22A, *Air Quality Analysis Methodology,* for additional detail on quantification methods).

Substitution of 103 GWh of electricity with a mix of sources similar to the current statewide mix would result in emissions of 28,851 metric tons of CO_2e; however, under expected future conditions (after full implementation of the RPS), emissions would be 22,419 metric tons of CO_2e.

Use of CVP hydroelectricity to meet increased electricity demand from operation of CVP facilities associated with Alternative 2B would reduce available CVP hydroelectricity to other California electricity users. Substitution of the lost electricity with electricity from other sources could indirectly result in an increase of GHG emissions that is comparable or larger than the level of GHG emissions that trigger mandatory GHG reporting for major facilities. As a result, these emissions could contribute to a cumulatively considerable effect and are therefore adverse. However, these emissions would be caused by dozens of independent electricity users, who had previously bought CVP power, making decisions about different ways to substitute for the lost power. These decisions are beyond the control of Reclamation or any of the other BDCP Lead Agencies. Further, monitoring to determine the actual indirect change in emissions as a result of BDCP actions would not be feasible. In light of the impossibility of predicting where any additional emissions would occur, as well as Reclamation's lack of regulatory authority over the purchasers of power in the open market, no workable mitigation is available or feasible.

***CEQA Conclusion*:** Operation of the CVP is a federal activity beyond the control of any State agency such as DWR, and the power purchases by private entities or public utilities in the private marketplace necessitated by a reduction in available CVP-generated hydroelectric power are beyond the control of the State, just as they are beyond the control of Reclamation. For these reasons, there are no feasible mitigation measures that could reduce this potentially significant indirect impact, which is solely attributable to operations of the CVP and not the SWP, to a less than significant level. This impact is therefore determined to be significant and unavoidable**.**

Impact AQ-24: Generation of Regional Criteria Pollutants from Implementation of CM2–CM11

NEPA Effects: Table 22-38 summarizes potential construction and operational emissions that may be generated by implementation of CM2–CM11. See the discussion of Impact AQ-24 under Alternative 1A.

Criteria pollutants from restoration and enhancement actions could exceed applicable general conformity *de minimis* levels and applicable local thresholds. The effect would vary according to the equipment used in construction of a specific conservation measure, the location, the timing of the actions called for in the conservation measure, and the air quality conditions at the time of implementation; these effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. The effect of increases in emissions during implementation of CM2–CM11 in excess of applicable general conformity *de minimis* levels and air district regional thresholds (Table 22-8) could violate air basin SIPs and worsen existing air quality conditions. Mitigation Measure AQ-24 would be available to reduce this effect, but emissions would still be adverse.

***CEQA Conclusion*:** Construction and operational emissions associated with the restoration and enhancement actions would result in a significant impact if the incremental difference, or increase, relative to Existing Conditions exceeds the applicable local air district thresholds shown in Table 22-8; these effects are expected to be further evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measure AQ-24 would be available to reduce this effect, but may not be sufficient to reduce emissions below applicable air quality management district thresholds (see Table 22-8). Consequently, this impact would be significant and unavoidable.

Mitigation Measure AQ-24: Develop an Air Quality Mitigation Plan (AQMP) to Ensure Air District Regulations and Recommended Mitigation are Incorporated into Future Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-24 under Impact AQ-24 in the discussion of Alternative 1A.

Impact AQ-25: Exposure of Sensitive Receptors to Health Hazards from Localized Particulate Matter, Carbon Monoxide, and Diesel Particulate Matter from Implementation of CM2–CM11

NEPA Effects: The potential for Alternative 2B to expose sensitive receptors increased health hazards from localized PM, CO, and DPM would be similar to Alternative 1A. Activities shown in Table 22-38 with the greatest potential to have short or long-term air quality impacts are also anticipated to have the greatest potential to expose receptors to substantial pollutant concentrations. The effect would vary according to the equipment used, the location and timing of the actions called for in the conservation measure, the meteorological and air quality conditions at the time of implementation, and the location of receptors relative to the emission source. Potential health effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions.

The effect of increases in PM, CO, or DPM (cancer and non-cancer-risk) in excess of applicable air district thresholds (Table 22-8) at receptor locations could result in adverse health impacts. Mitigation Measures AQ-24 and AQ-25 would be available to reduce this effect.

CEQA Conclusion**:** Construction and operational emissions associated with the restoration and enhancement actions under Alternative 2B would result in a significant impact if PM, CO, or DPM (cancer and non-cancer-risk) concentrations at receptor locations exceed the applicable local air district thresholds shown in Table 22-8; these effects are expected to be further evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measures AQ-24 and AQ-25 would ensure localized concentrations at receptor locations would be below applicable air quality management district thresholds (see Table 22-8). Consequently, this impact would be less than significant.

Mitigation Measure AQ-24: Develop an Air Quality Mitigation Plan (AQMP) to Ensure Air District Regulations and Recommended Mitigation are Incorporated into Future Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-24 under Impact AQ-24 in the discussion of Alternative 1A.

Mitigation Measure AQ-25: Prepare a Project-Level Health Risk Assessment to Reduce Potential Health Risks from Exposure to Localized DPM and PM Concentrations

Please see Mitigation Measure AQ-25 under Impact AQ-25 in the discussion of Alternative 1A.

Impact AQ-26: Creation of Potential Odors Affecting a Substantial Number of People from Implementation of CM2–CM11

NEPA Effects: The potential for Alternative 2B to expose sensitive receptors increased odors would be similar to Alternative 1A. Accordingly, construction activities associated with CM2-CM11 are not anticipated to result in nuisance odors. Similarly, while restored land uses associated with the program have the potential to generate odors from natural processes, the emissions would be similar in origin and magnitude to the existing land use types in the restored area (e.g., managed wetlands). Moreover, specific odor effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Accordingly, odor-related effects associated with CM2–CM11 would not be adverse.

CEQA Conclusion**:** Alternative 2B would not result in the addition of major odor producing facilities. Diesel emissions during construction could generate temporary odors, but these would quickly dissipate and cease once construction is completed. Increases in wetland, tidal, and upland habitats may increase the potential for odors from natural processes. However, the origin and magnitude of odors would be similar to the existing land use types in the restored area (e.g., managed wetlands). Moreover, specific odor impacts would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Accordingly, the impact of exposure of sensitive receptors to potential odors would be less than significant. No mitigation is required.

Impact AQ-27: Generation of Cumulative Greenhouse Gas Emissions from Implementation of CM2–CM11

NEPA Effects: CM2–CM11 implemented under Alternative 2B would result in local GHG emissions from construction equipment and vehicle exhaust, similar to Alternative 1A. Restoration activities with the greatest potential for emissions include those that break ground and require use of earthmoving equipment. The type of restoration action and related construction equipment use are shown in Table 22-47. Implementing CM2–CM11 would also affect long-term sequestration rates through land use changes, such as conversion of agricultural land to wetlands, inundation of peat soils, drainage of peat soils, and removal or planting of carbon-sequestering plants.

Without additional information on site-specific characteristics associated with each of the restoration components, a complete assessment of GHG flux from CM2–CM11 is currently not possible. The effect of carbon sequestration and CH_4 generation would vary by land use type, season, and chemical and biological characteristics; these effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measures AQ-18 and AQ-19 would be available to reduce this effect. However, due to the potential for increases in GHG emissions from construction and land use change, this effect would be adverse.

***CEQA Conclusion*:** The restoration and enhancement actions under Alternative 2B could result in a significant impact if activities are inconsistent with applicable GHG reduction plans, do not contribute to a lower carbon future, or generate excessive emissions, relative to other projects throughout the state. These effects are expected to be further evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measures AQ-24 and AQ-27 would be available to reduce this impact, but may not be sufficient to reduce to a less-than-significant level. Consequently, this impact would be significant and unavoidable.

Mitigation Measure AQ-24: Develop an Air Quality Mitigation Plan (AQMP) to Ensure Air District Regulations and Recommended Mitigation are Incorporated into Future Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-24 under Impact AQ-24 in the discussion of Alternative 1A.

Mitigation Measure AQ-27: Prepare a Land Use Sequestration Analysis to Quantify and Mitigate (as Needed) GHG Flux Associated with Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-27 under Impact AQ-27 in the discussion of Alternative 1A.

22.3.3.7 Alternative 2C—Dual Conveyance with West Alignment Intakes W1–W5 (15,000 cfs; Operational Scenario B)

A total of five intakes would be constructed under Alternative 2C. They would be sited on the west bank of the Sacramento River, opposite the locations identified for the pipeline/tunnel and east alignments. Under this alternative, water would be carried south in a canal along the western side of the Delta to an intermediate pumping plant and then pumped through a tunnel to a continuing canal to the proposed Byron Tract Forebay immediately northwest of Clifton Court Forebay (Figures 3-6 and 3-7 in Chapter 3, *Description of Alternatives*). The severity and location of effects are anticipated to be similar to Alternative 1C.

Construction and operation of Alternative 2C would require the use of electricity, which would be supplied by the California electrical grid. Power plants located throughout the state supply the grid with power, which will be distributed to the Study area to meet project demand. Power supplied by statewide power plants will generate criteria pollutants. Because these power plants are located throughout the state, criteria pollutant emissions associated with Alternative 2C electricity demand cannot be ascribed to a specific air basin or air district within the Study area. Criteria pollutant emissions from electricity consumption are therefore provided for informational purposes only and are not included in the impact conclusion.

Electricity demand for construction of Alternative 2C would be to equal demand required for Alternative 1C. Electricity emissions generated by Alternative 1C would therefore be representative of emissions generated by Alternative 2C. Refer to Table 22-58 for a summary of electricity-related criteria pollutants during construction (years 2016 through 2029) of Alternative 1C that are applicable to this alternative. Operational emissions would be different from Alternative 1C and are provided in Table 22-80.

Table 22-80. Criteria Pollutant Emissions from Electricity Consumption: Net Project Operations, Alternative 2C (tons/year) [a,b]

Year	Analysis	ROG	CO	NO_X	PM10	PM2.5[c]	SO_2
ELT	CEQA	1	8	111	9	9	47
LLT	NEPA	2	14	198	17	17	84
LLT	CEQA	0	2	33	3	3	14

NEPA = Compares criteria pollutant emissions after implementation of Alternative 2C to the No Action Alternative.

CEQA = Compares criteria pollutant emissions after implementation of Alternative 2C to Existing Conditions.

[a] Emissions assume implementation of RPS (see Appendix 22A, *Air Quality Analysis Methodology*). Power plants that generate electricity for the proposed project would be subject to local air district permitting requirements, including standards to implement BACT to reduce criteria pollutant emissions.

[b] Because GHG emissions are cumulative (see Section 22.3.2.1) and not evaluated at the local air basin or air district level, they are discussed in Impacts AQ-21 and AQ-22. The GHG analysis for SWP power utilizes actual and forecasted GHG emissions rates for the SWP system, which differs slightly from the above analysis. Statewide grid average emission factors were utilized for the above analysis as criteria pollutant emission factors for SWP were unavailable. Please also note that the above analysis does not account for additional renewable energy that will be procured through modifications to DWR's REPP (see Impact AQ-22). Accordingly, the emissions results presented above represent a conservative assessment of potential criteria pollutant emissions.

[c] Emission factors for PM2.5 are currently unavailable. Consequently, PM2.5 emissions were assumed to equal PM10 emissions. Because PM2.5 represents a fraction of PM10, this approach represents a conservative assessment of PM2.5 emissions from electricity consumption.

Alternative 2C would comprise physical/structural components similar to those under Alternative 1C, but would entail an operable barrier along the San Joaquin separate fish movement corridor at the upstream confluence of Old River and the San Joaquin River (head of Old River). Emissions generated by construction of all features other than the head of Old River barrier under Alternative 1C would be representative of emissions generated by Alternative 2C (refer to Table 22-48).

The head of Old River barrier would be constructed within the SJVAPCD between 2022 and 2024. This would be the only feature constructed within the SJVAPCD under Alternative 2B. Emissions associated with construction are shown in Table 22-81. Exceedances of the air district thresholds are shown in underlined text.

Table 22-81. Criteria Pollutant Emissions from Construction of Alternative 2C within the SJVAPCD (tons/year)

Year	ROG	NO_X	CO	PM10 Exhaust	PM10 Dust	PM10 Total	PM2.5 Exhaust	PM2.5 Dust	PM2.5 Total	SO_2
2016	0	0	0	0	0	0	0	0	0	0
2017	0	0	0	0	0	0	0	0	0	0
2018	0	0	0	0	0	0	0	0	0	0
2019	0	0	0	0	0	0	0	0	0	0
2020	0	0	0	0	0	0	0	0	0	0
2021	0	0	0	0	0	0	0	0	0	0
2022	<1	3	4	<1	<1	<1	<1	<1	<1	<1
2023	<1	3	3	<1	<1	<1	<1	<1	<1	<1
2024	<1	2	2	<1	<1	<1	<1	<1	<1	<1
2025	0	0	0	0	0	0	0	0	0	0
2026	0	0	0	0	0	0	0	0	0	0
2027	0	0	0	0	0	0	0	0	0	0
2028	0	0	0	0	0	0	0	0	0	0
2029	0	0	0	0	0	0	0	0	0	0
Thresholds	10	10	-	-	-	15	-	-	15	-

Daily operation and maintenance activities under Alternative 2C would be the same as those generated under Alternative 1C (see Table 22-49). Yearly maintenance would be similar to those under Alternative 1C, but would also include annual inspections and sediment removal at the operable barrier in San Joaquin County. Table 22-82 summarizes annual criteria pollutant emissions associated with operation of Alternative 2C in the SJVAPCD.

Table 22-82. Criteria Pollutant Emissions from Operation of Alternative 2C in SJVAPCD (pounds per day and tons per year)

	San Joaquin Valley Air Pollution Control District					
Condition	ROG	NO_X	CO	PM10	PM2.5	SO_2
ELT	<0.01	<0.01	0.01	0.01	<0.01	<0.01
LLT	<0.01	<0.01	0.01	0.01	<0.01	<0.01
Thresholds	*10*	*10*	-	*15*	*15*	-

Impact AQ-1: Generation of Criteria Pollutants in Excess of the SMAQMD Regional Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: Construction activity required for Alternative 2C was assumed to equal activity required for Alternative 1C. Emissions generated by Alternative 1C would therefore be representative of emissions generated by Alternative 2C. As shown in Table 22-48, emissions would exceed SMAQMD's daily NO_X threshold, even with implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*). Since NO_X is a precursor to ozone and PM, exceedances of SMAQMD's daily NO_X threshold could impact both regional ozone and PM formation, which could worsen regional air quality and air basin attainment of the NAAQS and CAAQS.

While equipment could operate at any work area identified for this alternative, the highest level of NO_X and fugitive dust emissions in the SMAQMD are expected to occur at those sites where the duration and intensity of construction activities would be greatest. See the discussion of Impact AQ-2 under Alternative 1C.

Environmental commitments will reduce construction-related emissions; however, as shown in Table 22-48, NO_X emissions would still exceed the air district threshold identified in Table 22-8 and would result in an adverse effect to air quality. Mitigation Measures AQ-1a and AQ-1b would be available to reduce NO_X emissions, and would thus address regional effects related to secondary ozone and PM formation.

***CEQA Conclusion*:** NO_X emissions generated during construction would exceed SMAQMD threshold identified in Table 22-8. Since NO_X is a precursor to ozone and PM, exceedances of SMAQMD's daily NO_X threshold could impact both regional ozone and PM formation. SMAQMD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS or NAAQS. The impact of generating NO_X emissions in excess of local air district thresholds would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. This would be a significant impact. Mitigation Measures AQ-1a and AQ-1b would be available to reduce NO_X emissions to a less-than-significant level by offsetting emissions to quantities below SMAQMD CEQA thresholds (see Table 22-8).

Mitigation Measure AQ-1a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-1a under Impact AQ-1 in the discussion of Alternative 1A.

Mitigation Measure AQ-1b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-1b under Impact AQ-1 in the discussion of Alternative 1A.

Impact AQ-2: Generation of Criteria Pollutants in Excess of the YSAQMD Regional Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: Construction activity required for Alternative 2C within the YSAQMD was assumed to equal activity required for Alternative 1C. Emissions generated by Alternative 1C would therefore be representative of emissions generated by Alternative 2C. As shown in Table 22-48, emissions would exceed YSAQMD's ROG, NO_X, and PM10 thresholds, even with implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*).

Since ROG and NO_X are precursors to ozone and PM, exceedances of SMAQMD's daily ROG and NO_X threshold could impact both regional ozone and PM formation, which could worsen regional air quality and air basin attainment of the NAAQS and CAAQS. Similarly, exceedances of YSAQMD's PM10 threshold could impede attainment of the NAAQS and CAAQS for PM10.

Environmental commitments outlined in Appendix 3B, *Environmental Commitments,* will reduce construction-related emissions; however, as shown in Table 22-48, ROG, NO_X, and PM10 emissions would still exceed the applicable YSAQMD thresholds identified in Table 22-8 and result in an adverse regional effect to air quality. Mitigation Measures AQ-1a and AQ-1b are available to reduce ROG, NO_X, and PM10 emissions, and would thus address regional effects related to secondary ozone and PM formation.

***CEQA Conclusion*:** Emissions of ROG, NO_X, and PM10 generated during construction would exceed YSAQMD's regional thresholds identified in Table 22-8. Since ROG and NO_X are precursors to ozone and PM, exceedances of SMAQMD's daily ROG and NO_X threshold could impact both regional ozone and PM formation, which could worsen regional air quality and air basin attainment of the NAAQS and CAAQS. Similarly, exceedances of YSAQMD's PM10 threshold could impede attainment of the NAAQS and CAAQS for PM10. YSAQMD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS or NAAQS. The impact of generating ROG, NO_X, and PM10 in excess of local air district regional thresholds would therefore violate applicable air quality standards in the study area and could contribute to or worsen an existing air quality conditions. This would be a significant impact. Mitigation Measures AQ-1a and AQ-1b would be available to reduce ROG, NO_X, and PM10 emissions to a less-than-significant level by offsetting emissions to quantities below YSAQMD CEQA thresholds (see Table 22-8).

Mitigation Measure AQ-1a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-1a under Impact AQ-1 in the discussion of Alternative 1A.

Mitigation Measure AQ-1b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-1b under Impact AQ-1 in the discussion of Alternative 1A.

Impact AQ-3: Generation of Criteria Pollutants in Excess of the BAAQMD Regional Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: Construction activity required for Alternative 2C was assumed to equal activity required for Alternative 1C. Emissions generated by Alternative 1C would therefore be representative of emissions generated by Alternative 2C. As shown in Table 22-48, construction emissions would exceed BAAQMD's daily ROG and NO_X thresholds, even with implementation of environmental commitments. All other pollutants would be below air district thresholds and therefore would not result in an adverse air quality effect.

Since ROG and NO_X are precursors to ozone and NO_X is a precursor to PM, exceedances of BAAQMD's ROG and NO_X thresholds could impact both regional ozone and PM formation, which could worsen regional air quality and air basin attainment of the NAAQS and CAAQS.

While equipment could operate at any work area identified for this alternative, the highest level of ROG and NO_X emissions in the BAAQMD are expected to occur at those sites where the duration and intensity of construction activities would be greatest, including the site of the Byron Tract Forebay adjacent to and south of Clifton Court Forebay.

Environmental commitments outlined in Appendix 3B, *Environmental Commitments,* will reduce construction-related emissions; however, as shown in Table 22-48, ROG and NO_X emissions would still exceed the applicable air district thresholds identified in Table 22-8 and result in an adverse effect to air quality. Although Mitigation Measures AQ-3a and AQ-3b would reduce ROG and NO_X, given the magnitude of estimated emissions, neither measure would reduce emissions below district thresholds.[35] Accordingly, this effect would be adverse.

CEQA Conclusion**:** Emissions of ROG and NO_X precursors generated during construction would exceed BAAQMD regional thresholds identified in Table 22-8. Since ROG and NO_X are precursors to ozone and NO_X is a precursor to PM, exceedances of BAAQMD's ROG and NO_X thresholds could impact both regional ozone and PM formation. BAAQMD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS or NAAQS. The impact of generating emissions in excess of BAAQMD thresholds would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Although Mitigation Measures AQ-3a and AQ-3b would reduce ROG and NO_X, given the magnitude of estimated emissions, neither measure would reduce emissions below district thresholds. Accordingly, this impact would be significant and unavoidable.

Mitigation Measure AQ-3a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within BAAQMD/SFBAAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable BAAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-3a under Impact AQ-3 in the discussion of Alternative 1A.

Mitigation Measure AQ-3b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the BAAQMD/SFBAAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable BAAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-3b under Impact AQ-3 in the discussion of Alternative 1A.

[35] The amount of moneys required to achieve sufficient contracts to reduce project emissions below air district thresholds would require immediate and substantial outreach, staffing, and other resources. There are also a number of hurdles related to accelerating equipment turnover and identifying available projects. While the mitigation measure will reduce project emissions, it is unlikely sufficient resources can be identified to reduce emissions by the amount required to achieve a less-than-significant finding.

Impact AQ-4: Generation of Criteria Pollutants in Excess of the SJVAPCD Regional Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: As shown in Table 22-81, construction emissions would not exceed SJVAPCD's annual thresholds. Accordingly, there would be no adverse air quality effect.

***CEQA Conclusion*:** Construction emissions would not exceed SJVAPCD's annual thresholds. Accordingly, this impact would be less than significant.

Impact AQ-6: Generation of Criteria Pollutants in Excess of the SMAQMD Regional Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance activities in SMAQMD required for Alternative 2C were assumed to equal activities required for Alternative 1C. Emissions generated by Alternative 1C would therefore be representative of emissions generated by Alternative 2C. As shown in Table 22-49, emissions would not exceed SMAQMD's regional thresholds of significance and there would be no adverse effect. See the discussion of Impact AQ-5 under Alternative 1C.

***CEQA Conclusion*:** Emissions generated during operation and maintenance activities would not exceed SMAQMD regional thresholds for criteria pollutants. SMAQMD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS or NAAQS. The impact of generating emissions in excess of local air district would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Because project operations would not exceed SMAQMD regional thresholds, the impact would be less than significant. No mitigation is required.

Impact AQ-6: Generation of Criteria Pollutants in Excess of the YSAQMD Regional Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance activities in YSAQMD required for Alternative 2C were assumed to equal activities required for Alternative 1C. Emissions generated by Alternative 1C would therefore be representative of emissions generated by Alternative 2C. As shown in Table 22-49, emissions would not exceed YSAQMD's regional thresholds of significance and there would be no adverse effect. See the discussion of Impact AQ-6 under Alternative 1C.

***CEQA Conclusion*:** Emissions generated during operation and maintenance activities would not exceed YSAQMD's regional thresholds for criteria pollutants. YSAQMD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS. Projects that do not violate YSAQMD's regional thresholds will therefore not conflict with local, state, and federal efforts to improve regional air quality in the SFNA. The impact would be less than significant. No mitigation is required.

Impact AQ-7: Generation of Criteria Pollutants in Excess of the BAAQMD Regional Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance activities in BAAQMD required for Alternative 2C were assumed to equal activities required for Alternative 1C. Emissions generated by Alternative 1C would therefore be representative of emissions generated by Alternative 2C. As shown in Table 22-49, emissions would not exceed BAAQMD's regional thresholds of significance and there would be no adverse effect. See the discussion of Impact AQ-7 under Alternative 1C.

***CEQA Conclusion*:** Emissions generated during operation and maintenance activities would not exceed BAAQMD regional thresholds for criteria pollutants. BAAQMD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS or NAAQS. The impact of generating emissions in excess of local air district thresholds would violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Because project operations would not exceed BAAQMD regional thresholds, the impact would be less than significant. No mitigation is required.

Impact AQ-8: Generation of Criteria Pollutants in Excess of the SJVAPCD Regional Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance in SJVAPCD include annual inspections and sediment removal (see Appendix 22A, *Air Quality Analysis Methodology,* for additional detail). The highest concentration of operational emissions in the SJVPACD is expected at routine inspection sites along the west canal alignment and at the operable barrier. As shown in Table 22-82, operation and maintenance activities under Alternative 2C would not exceed SJVAPCD's regional thresholds of significance (see Table 22-8). Accordingly, project operations would not contribute to or worsen existing air quality violations. There would be no adverse effect.

***CEQA Conclusion*:** Operational emissions generated by the alternative would not exceed SJVAPCD's regional thresholds of significance. SJVAPCD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS or NAAQS. Projects that do not violate SJVAPCD regional thresholds will therefore not conflict with local, state, and federal efforts to improve regional air quality in the SJVAB. This impact would be less than significant. No mitigation is required.

Impact AQ-9: Exposure of Sensitive Receptors to Health Hazards from Localized Particulate Matter in Excess of SMAQMD's Health-Based Concentration Thresholds

NEPA Effects: Construction activity required for Alternative 2C within the SMAQMD was assumed to equal activity required for Alternative 1C. Emissions and associated health risks from exposure to localized PM under Alternative 1C would therefore be representative of emissions and health risks generated by Alternative 2C. As shown in Table 22-50, concentrations of annual PM10 and PM2.5 would be below the SMAQMD's significance thresholds. However, concentrations of PM10 would exceed SMAQMD's 24-hour PM10 threshold, even with implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*). Receptors exposed to PM10 concentrations in excess of SMAQMD's threshold could experience increased risk for adverse human health effects. Mitigation Measure AQ-9 is available to address this effect.

***CEQA Conclusion*:** Respirable particulates pose a human health hazard by bypassing the defenses within the mucous ciliary system and entering deep lung tissue. Construction of Alternative 2C would result in the short-term exposure of receptors to PM10 concentrations that exceed SMAQMD threshold. This would be a significant impact. Mitigation Measure AQ-9 outlines a tiered strategy to reduce PM10 concentrations and public exposure to a less-than-significant level.

Mitigation Measure AQ-9: Implement Measures to Reduce Re-Entrained Road Dust and Receptor Exposure to PM2.5 and PM10

Please see Mitigation Measure AQ-9 under Impact AQ-9 in the discussion of Alternative 1A.

Impact AQ-10: Exposure of Sensitive Receptors to Health Hazards from Localized Particulate Matter in Excess of YSAQMD's Health-Based Concentration Thresholds

NEPA Effects: Construction activity required for Alternative 2C within the YSAQMD was assumed to equal activity required for Alternative 1C. Emissions and associated health risks from exposure to localized PM under Alternative 1C would therefore be representative of emissions and health risks generated by Alternative 2C. As shown previously in Table 22-51, concentrations of particulate matter would not exceed YSAQMD's 24-hour and annual PM10 and PM2.5 thresholds and consequently would not result in an adverse effect to human health at the analyzed receptors.

***CEQA Conclusion*:** Respirable particulates pose a human health hazard by bypassing the defenses within the mucous ciliary system and entering deep lung tissue. Construction of Alternative 2C would result in PM2.5 and PM10 concentrations at receptor locations that are below the significance thresholds established by the YSAQMD. As such, localized particulate matter concentrations at analyzed receptors would not result in significant human health impacts. No mitigation is required.

Impact AQ-11: Exposure of Sensitive Receptors to Health Hazards from Localized Particulate Matter in Excess of BAAQMD's Health-Based Concentration Thresholds

NEPA Effects: Construction activity required for Alternative 2C within the BAAQMD was assumed to equal activity required for Alternative 1C. Emissions and associated health risks from exposure to localized PM under Alternative 1C would therefore be representative of emissions and health risks generated by Alternative 2C. As shown in Table 22-52, concentrations of particulate matter would not exceed BAAQMD's annual PM2.5 threshold and consequently would not result in an adverse effect to human health.

***CEQA Conclusion*:** Respirable particulates pose a human health hazard by bypassing the defenses within the mucous ciliary system and entering deep lung tissue. Construction of Alternative 2C would result in PM2.5 concentrations at receptor locations that are below the significance thresholds established by the BAAQMD. As such, localized particulate matter concentrations at analyzed receptors would not result in significant human health impacts. No mitigation is required.

Impact AQ-12: Exposure of Sensitive Receptors to Health Hazards from Localized Particulate Matter in Excess of SJVAPCD's Health-Based Concentration Thresholds

NEPA Effects: As described above, Alternative 2C includes construction of the Head of Old River Barrier. While emissions would be generated during construction of the barrier, they would not result in PM concentrations at adjacent receptor locations in excess of SJVAPCD thresholds. Accordingly, there would be no adverse effect.

***CEQA Conclusion*:** Respirable particulates pose a human health hazard by bypassing the defenses within the mucous ciliary system and entering deep lung tissue. Construction of the Head of Old River Barrier would not result in PM concentrations at receptor in excess of SJVAPCD thresholds. As such, localized particulate matter concentrations at analyzed receptors would not result in significant human health impacts. No mitigation is required.

Impact AQ-13: Exposure of Sensitive Receptors to Health Hazards from Localized Carbon Monoxide

NEPA Effects: Construction activity required for Alternative 2C would be similar to activity required for Alternative 1C. Accordingly, the potential for Alternative 2C to result in CO hot-spots during construction would be the same as Alternative 1C. Given that construction activities typically do not result in CO hot-spots, onsite concentrations must comply with OSHA standards, and CO levels dissipate as a function of distance, equipment-generated CO emissions (see Table 22-48) are not anticipated to result in adverse health hazards to sensitive receptors. Refer to Impact AQ-13 under Alternative 1C.

Traffic associated with construction may contribute to increase roadway congestion, which could lead to conditions conducive to CO hot-spot formation. As shown in Table 19-21, the highest peak hour traffic volumes under BPBGPP—11,863 vehicles per hour—would occur on westbound Interstate 80 between Suisun Valley Road and State Route 12. This is about half of the congested traffic volume modeled by BAAQMD (24,000 vehicles per hour) that would be needed to contribute to a localized CO hot-spot, and less than half of the traffic volume modeled by SMAQMD (31,600 vehicles per hour). Accordingly, construction traffic is not anticipated to result in adverse health hazards to sensitive receptors.

***CEQA Conclusion*:** Continuous engine exhaust may elevate localized CO concentrations. Receptors exposed to these CO "hot-spots" may have a greater likelihood of developing adverse health effects. Construction sites are less likely to result in localized CO hot-spots due to the nature of construction activities (Sacramento Metropolitan Air Quality Management District 2014), which normally utilize diesel-powered equipment for intermittent or short durations. Moreover, construction sites must comply with the OSHA CO exposure standards for onsite workers. Accordingly, given that construction activities typically do not result in CO hot-spots, onsite concentrations must comply with OSHA standards, and CO levels dissipate as a function of distance, equipment-generated CO emissions are not anticipated to result in significant health hazards to sensitive receptors. Similarly, peak-hour construction traffic on local roadways would not exceed BAAQMD's or SMAQMD's conservative screening criteria for the formation potential CO hot-spots. This impact would be less than significant. No mitigation is required.

Impact AQ-14: Exposure of Sensitive Receptors to Health Hazards from Diesel Particulate Matter in Excess of SMAQMD's Chronic Non-Cancer and Cancer Risk Thresholds

NEPA Effects: Construction activity required for Alternative 2C within the SMAQMD was assumed to equal activity required for Alternative 1C. Emissions and associated health risks from exposure to localized DPM under Alternative 1C would therefore be representative of emissions and health risks generated by Alternative 2C.

As shown in Table 22-53, Alternative 1C would not exceed the SMAQMD's chronic non-cancer or cancer thresholds and, thus, would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to DPM emissions and their health hazards during construction would not be adverse.

***CEQA Conclusion*:** DPM generated during construction poses inhalation-related chronic non-cancer hazard and cancer risk if adjacent receptors are exposed to significant concentrations for prolonged durations. The health hazards resulting from DPM generated by Alternative 2C would not exceed the SMAQMD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this impact for DPM health hazards would be less than significant. No mitigation is required.

Impact AQ-15: Exposure of Sensitive Receptors to Health Hazards from Diesel Particulate Matter in Excess of YSAQMD's Chronic Non-Cancer and Cancer Risk Thresholds

NEPA Effects: Construction activity required for Alternative 2C within the YSAQMD was assumed to equal activity required for Alternative 1C. Emissions and associated health risks from exposure to localized DPM under Alternative 1C would therefore be representative of emissions and health risks generated by Alternative 2C. As shown in Table 22-54, Alternative 1C would not exceed the YSAQMD's chronic non-cancer or cancer thresholds and, thus, would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to DPM emissions and their health hazards during construction would not be adverse.

***CEQA Conclusion*:** DPM generated during construction poses inhalation-related chronic non-cancer hazard and cancer risk if adjacent receptors are exposed to significant concentrations for prolonged durations. The health hazards resulting from DPM generated by Alternative 2C would not exceed the YSAQMD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this impact for DPM health hazards would be less than significant. No mitigation is required.

Impact AQ-16: Exposure of Sensitive Receptors to Health Hazards from Diesel Particulate Matter in Excess of BAAQMD's Chronic Non-Cancer and Cancer Risk Thresholds

NEPA Effects: Construction activity required for Alternative 2C within the BAAQMD was assumed to equal activity required for Alternative 1C. Emissions and associated health risks from exposure to localized DPM under Alternative 1C would therefore be representative of emissions and health risks generated by Alternative 2C. As shown in Table 22-55, chronic risk would be below the BAAQMD's significance thresholds. However, cancer risk would exceed BAAQMD's cancer significance threshold, even with implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*). Therefore, this alternative's effect of exposure of sensitive receptors to DPM-related health hazards during construction would be adverse.

Mitigation Measure AQ-16 would be available to reduce exposure to substantial cancer risk by relocating affected receptors. Although Mitigation Measure AQ-16 would reduce the severity of this effect, the BDCP proponents are not solely responsible for implementation of the measure. If a landowner chooses not to accept DWR's offer of relocation assistance, an adverse effect in the form excess cancer risk above air district thresholds would occur. Therefore, this effect would be adverse. If, however, all landowners accept DWR's offer of relocation assistance, effects would not be adverse.

***CEQA Conclusion*:** DPM generated during construction poses inhalation-related chronic non-cancer hazard and cancer risk if adjacent receptors are exposed to significant concentrations for prolonged durations. The DPM generated during Alternative 2C construction would not exceed the BAAQMD's chronic non-cancer hazard and thus would not expose sensitive receptors to substantial health hazards for chronic exposure of DPM. However, the project emissions would result in exceedances of the BAAQMD's cancer risk threshold. Therefore, this impact for DPM emissions would be significant.

Mitigation Measure AQ-16 would be available to reduce exposure to substantial cancer risk by relocating affected receptors. Although Mitigation Measure AQ-16 would reduce the severity of this effect, the BDCP proponents are not solely responsible for implementation of the measure. If a landowner chooses not to accept DWR's offer of relocation assistance, a significant impact in the form excess cancer risk above air district thresholds would occur. Therefore, this effect would be significant and unavoidable. If, however, all landowners accept DWR's offer of relocation assistance, the impact would be less than significant.

Mitigation Measure AQ-16: Relocate Sensitive Receptors to Avoid Excess Cancer Risk

Please see Mitigation Measure AQ-16 under Impact AQ-16 in the discussion of Alternative 1A.

Impact AQ-17: Exposure of Sensitive Receptors to Health Hazards from Diesel Particulate Matter in Excess of SJVAPCD's Chronic Non-Cancer and Cancer Risk Thresholds

NEPA Effects: As described above, Alternative 2C includes construction of the Head of Old River Barrier. While emissions would be generated during construction of the barrier, they would not result in DPM concentrations at adjacent receptor locations in excess of SJVAPCD thresholds. Accordingly, there would be no adverse effect.

CEQA Conclusion**:** Construction of the Head of Old River Barrier would not result in DPM concentrations at receptor in excess of SJVAPCD thresholds. As such, construction-related DPM would not result in significant human health impacts. No mitigation is required.

Impact AQ-18: Exposure of Sensitive Receptors to *Coccidioides immitis* (Valley Fever)

NEPA Effects**:** As discussed under Alternative 1A, earthmoving activities during construction could release *C. immitis* spores if filaments are present and other soil chemistry and climatic conditions are conducive to spore development. Receptors adjacent to the construction area may therefore be exposed to increase risk of inhaling *C. immitis* spores and subsequent development of Valley Fever. Dust-control measures are the primary defense against infection (United States Geological Survey 2000). Implementation of advanced air-district recommended fugitive dust controls outlined in Appendix 3B, *Environmental Commitments*, would avoid dusty conditions and reduce the risk of contracting Valley Fever through routine watering and other controls. Therefore, this alternative's effect of exposure of sensitive receptors to increased Valley Fever risk during construction would not be adverse.

CEQA Conclusion: Construction of the water conveyance facility would involve earthmoving activities that could release *C. immitis* spores if filaments are present and other soil chemistry and climatic conditions are conducive to spore development. Receptors adjacent to the construction area may therefore be exposed to increase risk of inhaling *C. immitis* spores and subsequent development of Valley Fever. Implementation of air-district recommended fugitive dust controls outlined in Appendix 3B, *Environmental Commitments*, would avoid dusty conditions and reduce the risk of contracting Valley Fever through routine watering and other controls. Therefore, this impact would be less than significant. No mitigation is required.

Impact AQ-19: Creation of Potential Odors Affecting a Substantial Number of People during Construction or Operation of the Proposed Water Conveyance Facility

NEPA Effects: As discussed under Alternative 1A, odors from construction activities would be localized and generally confined to the immediate area surrounding the construction site. Moreover, odors would be temporary and localized, and they would cease once construction activities have been completed. Thus, it is not anticipated that construction of CM1 would create objectionable odors from construction equipment or asphalt paving.

Construction of the water conveyance facility would require removal of subsurface material during tunnel excavation and sediment removal. As discussed under Alternative 1A, geotechnical tests indicate that VOC levels in Plan Area soils are below the method detection limits, indicating that organic decay of exposed RTM and sediment will be relatively low (URS 2014). Moreover, drying and stockpiling of the removed RTM and sediment will occur under aerobic conditions, which will further limit any potential decomposition and associated malodorous products. Accordingly, it is not anticipated that tunnel and sediment excavation would create objectionable odors.

Typical facilities known to produce odors include landfills, wastewater treatment plants, food processing facilities, and certain agricultural activities. Alternative 2C would not result in the addition of facilities associated with odors, and as such, long-term operation of the water conveyance facility would not result in objectionable odors.

CEQA Conclusion: Alternative 2C would not result in the addition of major odor producing facilities. Diesel emissions during construction could generate temporary odors, but these would quickly dissipate and cease once construction is completed. Likewise, potential odors generated during asphalt paving would be addressed through mandatory compliance with air district rules and regulations. While tunnel excavation would unearth substantial quantities of RTM, geotechnical tests indicate that soils in the Plan Area have relatively low organic constituents. Moreover, drying and stockpiling of the removed RTM will occur under aerobic conditions, which will further limit any potential decomposition and associated malodorous products. Accordingly, the impact of exposure of sensitive receptors to potential odors during construction would be less than significant. No mitigation is required.

Impact AQ-20: Generation of Criteria Pollutants in the Excess of Federal *De Minimis* Thresholds from Construction and Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: As discussed above, emissions generated by Alternative 1C within the SFNA and SFBAAB would be representative of emissions generated by Alternative 2C (refer to Table 22-56). Due to the operable barrier at head of Old River, a minor amount of emissions would be generated in the SJVAB under Alternative 2C. These emissions would be generated during the last three years of construction and are presented in Table 22-83. Exceedances of the federal *de minimis* thresholds are shown in underlined text.

Table 22-83. Criteria Pollutant Emissions from Construction and Operation of Alternative 2C in Nonattainment and Maintenance Areas of the SJVAB (tons/year)

Year	ROG	NO_X[a]	CO[b]	PM10	PM2.5	SO_2
2016	0	0	0	0	0	0
2017	0	0	0	0	0	0
2018	0	0	0	0	0	0
2019	0	0	0	0	0	0
2020	0	0	0	0	0	0
2021	0	0	0	0	0	0
2022	<1	3	0	<1	<1	<1
2023	<1	3	0	<1	<1	<1
2024	<1	2	0	<1	<1	<1
2025	0	0	0	0	0	0
2026	0	0	0	0	0	0
2027	0	0	0	0	0	0
2028	0	0	0	0	0	0
2029	0	0	0	0	0	0
ELT	<0.01	<0.01	0.01	0.01	<0.01	<0.01
LLT	<0.01	<0.01	0.01	0.01	<0.01	<0.01
De Minimis	10	10	100	100	100	100

[a] NO_X emissions in excess of 100 tons per year within federally designated PM10 and PM2.5 nonattainment or maintenance areas trigger a secondary PM10 and PM2.5 precursor threshold. NO_X emissions in excess of this secondary threshold could conflict with the applicable PM10 and PM2.5 SIPs. Accordingly, NO_X offsets pursued for the purposes of general conformity for those years in which NO_X emissions exceed 100 tons must occur within the federally designated PM2.5 nonattainment and PM10 maintenance areas, as applicable.

[b] The proposed water conveyance facility is located within a federally designated CO attainment area. Accordingly, CO emissions generated by construction of CM1 are not subject to the General Conformity Rule and are excluded from the emissions summary and general conformity analysis (40 CFR Part 51 and 93, Section III.A). Emissions presented in the table are limited those generated by haul trucks, which would occur in federally designated CO maintenance area.

Sacramento Federal Nonattainment Area

As shown in Table 22-56, implementation of Alternative 1C (and thus Alternative 2C) would exceed the following SFNA federal *de minimis* thresholds:

- ROG: 2019–2025
- NO_X: 2018–2028

ROG and NO_X are precursors to ozone and NO_X is a precursor to PM, for which the SFNA is in nonattainment for the NAAQS. Since project emissions exceed the federal *de minimis* thresholds for ROG and NO_X, a general conformity determination must be made to demonstrate that total direct and indirect emissions of ROG and NO_X would conform to the appropriate SFNA SIP for each year of construction in which the *de minimis* thresholds are exceeded.

NO_X is also a precursor to PM and can contribute to PM formation. As discussed above, Sacramento County is currently designated maintenance for the PM10 NAAQS and portions of the SVAB are designated nonattainment for the PM2.5 NAAQS. NO_X emissions in excess of 100 tons per year in Sacramento County trigger a secondary PM10 precursor threshold, whereas NO_X emissions in excess of 100 tons per year in the SVAB trigger a secondary PM2.5 precursor threshold. Since NO_X emissions can contribute to PM formation, NO_X emissions in excess of these secondary precursor thresholds could conflict with the applicable PM10 and PM2.5 SIPs. Accordingly, NO_X offsets pursued for the purposes of general conformity for those years in which NO_X emissions exceed 100 tons must occur within the federally designated PM2.5 nonattainment and PM10 maintenance areas of the SVAB.

As shown in Table 22-48, NO_X emissions generated by construction activities in SMAQMD (Sacramento County) would not exceed 100 tons per year. Accordingly, the project does not trigger the secondary PM10 precursor threshold. As shown in Table 22-56, NO_X emissions in 2019 through 2027 would exceed 100 tons year in the SFNA. The project therefore triggers the secondary PM2.5 precursor threshold, requiring all NO_X offsets for 2019 through 2027 to occur within the federally designated PM2.5 nonattainment area within the SFNA. The nonattainment boundary for PM2.5 includes all of Sacramento County and portions of Yolo, El Dorado, Solano, and Placer counties.

The federal lead agencies (Reclamation, USFWS, and NMFS) demonstrate that project emissions would not result in a net increase in regional NO_X emissions, as construction-related NO_X would be fully offset to zero through implementation of Mitigation Measures AQ-1a and 1b, which require additional onsite mitigation and/or offsets. Mitigation Measures AQ-1a and 1b will ensure the requirements of the mitigation and offset program are implemented and conformity requirements for NO_X are met.

Mitigation Measure AQ-1a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-1a under Impact AQ-1 in the discussion of Alternative 1A.

Mitigation Measure AQ-1b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-1b under Impact AQ-1 in the discussion of Alternative 1A.

San Joaquin Valley Air Basin

As shown in Table 22-83, emissions generated by construction of the head of Old River barrier would not exceed any of the SJVAB federal *de minimis* thresholds. Accordingly, a general conformity determination is not required as total direct and indirect emissions would conform to the appropriate SJVAB SIPs.

San Francisco Bay Area Air Basin

As shown in Table 22-56, implementation of Alternative 1C (and thus Alternative 2C) would exceed the following SFBAAB federal *de minimis* thresholds:

- NO_X: 2019–2024

NO_X is a precursor to ozone, for which the SJVAB is in nonattainment for the NAAQS. Since project emissions exceed the federal *de minimis* threshold for NO_X, a general conformity determination must be made to demonstrate that total direct and indirect emissions of NO_X would conform to the appropriate SJVAB SIP for each year of construction in which the *de minimis* thresholds are exceeded.

NO_X is also a precursor to PM and can contribute to PM formation. As discussed above, the SFBAAB is currently designated nonattainment for the PM2.5 NAAQS. NO_X emissions in excess of 100 tons per year trigger a secondary PM precursor threshold, and could conflict with the applicable PM2.5 SIP. Accordingly, NO_X offsets pursued for the purposes of general conformity for those years in which NO_X emissions exceed 100 tons must occur within the federally designated PM2.5 nonattainment area of the SFBAAB, which is consistent with the larger nonattainment boundary for ozone.

Although Mitigation Measures AQ-3a and AQ-3b would reduce NO_X, given the magnitude of emissions; neither measure could feasibly reduce emissions to net zero. This impact would be adverse. In the event that Alternative 2C is selected as the APA, Reclamation, USFWS, and NMFS would need to demonstrate that conformity is met for NO_X through a local air quality modeling analysis (i.e., dispersion modeling) or other acceptable methods to ensure project emissions do not cause or contribute to any new exceedances of the NAAQS or increase the frequency or severity of any existing exceedances.

Mitigation Measure AQ-3a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the BAAQMD/SFBAAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable BAAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-3a under Impact AQ-3 in the discussion of Alternative 1A.

Mitigation Measure AQ-3b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the BAAQMD/SFBAAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable BAAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-3b under Impact AQ-3 in the discussion of Alternative 1A.

CEQA Conclusion: SFNA and SFBAAB are classified as nonattainment areas with regard to the ozone NAAQS. The impact of increases in criteria pollutant emissions above the air basin *de minimis* thresholds could conflict with or obstruct implementation of the applicable air quality plans. Since construction emissions in the SFNA and SFBAAB would exceed the *de minimis* thresholds for ROG (SFNA only) and NO_X, this impact would be significant.

Mitigation Measures AQ-1a and AQ-1bwould ensure project emissions would not result in an increase in regional ROG or NO_X emissions in the SFNA. These measures would therefore ensure total direct and indirect ROG and NO_X emissions generated by the project in the SFNA would conform to the appropriate air basin SIPs by offsetting the action's emissions in the same or nearby area to net zero.

Although Mitigation Measures AQ-3a and AQ-3b would reduce NO_X in the SFBAAB, given the magnitude of emissions; neither measure could feasibly reduce emissions to net zero. This impact would be significant and unavoidable.

Emissions within the SJVAB would not exceed the federal de minimis thresholds and as such, the project would conform to the appropriate SJVAB SIPs.

Impact AQ-21: Generation of Cumulative Greenhouse Gas Emissions during Construction of the Proposed Water Conveyance Facility

NEPA Effects: GHG emissions generated by construction of Alternative 2C would be similar to emissions generated for Alternative 1C (see Table 22-57). However, because Alternative 2C includes an operable barrier at head of Old River, total emissions associated with Alternative 2C would be slightly higher than Alternative 1C due to additional equipment activity. Table 22-84 summarizes GHG emissions associated with Alternative 2C. Emissions with are presented with implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*) and state mandates to reduce GHG emissions.

Table 22-84. GHG Emissions from Construction of Alternative 2C (metric tons/year)[a]

Year	Equipment and Vehicles (CO_2e)	Electricity (CO_2e)	Concrete Batching (CO_2)	Total CO_2e
2016	0	0	499	499
2017	0	0	0	0
2018	42,159	359	62,034	104,552
2019	142,951	2,009	9,744	154,704
2020	130,349	9,650	60,545	200,544
2021	156,016	25,692	120,086	301,794
2022	145,336	36,078	182,008	363,423
2023	170,765	32,117	177,701	380,583
2024	183,766	33,500	212,603	429,869
2025	95,161	22,599	141,966	259,726
2026	74,368	8,068	34,020	116,457
2027	64,634	1,541	49,062	115,237
2028	26,032	41	9,653	35,726
2029	0	1	0	1
Total	*1,231,537*	*171,656*	*1,059,921*	*2,463,113*

[a] Emissions estimates do not account for GHG flux from land disturbance. Surface and subsurface (e.g., tunneling) activities may oxidize peat soils, releasing GHG emissions. However, recent geotechnical surveys indicated that peat is negligible below 80 feet of depth. The tunnel will be placed below this range and the design adjusted if peat soils are discovered. Peat material encountered during surface excavation for non-tunnel work will be covered with top soil to reduce oxidation when needed.

Values may not total correctly due to rounding.

Table 22-58 summarizes GHG emissions that would be generated in the BAAQMD, SMAQMD, and YSAQMD. The head of Old River barrier would be constructed within the SJVAPCD under Alternative 2A. Table 22-85 summarizes GHG emissions that would be generated in the SJVAPCD. The table does not include emissions from electricity generation as these emissions would be generated by power plants located throughout the state (see discussion preceding this impact analysis). GHG emissions presented in Tables 22-58 and 22-85 are therefore provided for information purposes only.

Table 22-85. GHG Emissions from Construction of Alternative 2C by Air District (metric tons/year)[a]

Year	Equipment and Vehicles (CO_2e)	Concrete Batching (CO_2)[a]	Total CO_2e[b]
SJVAPCD	2,375	0	2,375

[a] Emissions assigned to each air district based on the number of batching plants located in that air district.
[b] Values may not total correctly due to rounding.

As shown in Table 22-84, construction of Alternative 2C would generate a total of 2.5 million metric tons of GHG emissions. This is equivalent to adding 518,000 typical passenger vehicles to the road during construction (U.S. Environmental Protection Agency 2014e). As discussed in section 22.3.2, *Determination of Effects*, any increase in emissions above net zero associated with construction of the BDCP water conveyance features would be adverse. Accordingly, this effect would be adverse. Mitigation Measure AQ-21, which would develop a GHG Mitigation Program to reduce construction-related GHG emissions to net zero, is available address this effect.

CEQA Conclusion: Construction of Alternative 2C would generate a total of 2.5 million metric tons of GHG emissions. This is equivalent to adding 518,000 typical passenger vehicles to the road during construction (U.S. Environmental Protection Agency 2014e). As discussed in section 22.3.2, *Determination of Effects*, any increase in emissions above net zero associated with construction of the BDCP water conveyance features would be significant. Mitigation Measure AQ-21 would develop a GHG Mitigation Program to reduce construction-related GHG emissions to net zero. Accordingly, this impact would be less-than-significant with implementation of Mitigation Measure AQ-21

Mitigation Measure AQ-21: Develop and Implement a GHG Mitigation Program to Reduce Construction Related GHG Emissions to Net Zero (0)

Please see Mitigation Measure AQ-21 under Impact AQ-21 in the discussion of Alternative 1A.

Impact AQ-22: Generation of Cumulative Greenhouse Gas Emissions from Operation and Maintenance of the Proposed Water Conveyance Facility and Increased Pumping

NEPA Effects: Operation of Alternative 2C would generate direct and indirect GHG emissions. Sources of direct emissions include heavy-duty equipment, on road crew trucks, and employee vehicle traffic. Indirect emissions would be generated predominantly by electricity consumption required for pumping as well as, maintenance, lighting, and other activities.

Table 22-86 summarizes long-term operational GHG emissions associated with operations, maintenance, and increased SWP pumping. Emissions were quantified for both ELT and LLT conditions, although activities would take place annually until project decommissioning. Emissions include state mandates to reduce GHG emissions (described in Impact AQ-21) are presented (there are no BDCP specific operational environmental commitments). Total CO_2e emissions are compared to both the No Action Alternative (NEPA point of comparison) and Existing Conditions (CEQA baseline). As discussed in Section 22.3.1.2, equipment emissions are assumed to be zero under both the No Action Alternative (NEPA point of comparison) and Existing Conditions (CEQA baseline). The equipment emissions presented in Table 22-86 are therefore representative of project impacts for both the NEPA and CEQA analysis.

Table 22-86. GHG Emissions from Operation, Maintenance, and Increased SWP Pumping, Alternative 2C (metric tons/year)

Condition	Equipment CO_2e	Electricity CO_{2e}		Total CO_2e	
		NEPA Point of Comparison	CEQA Baseline	NEPA Point of Comparison	CEQA Baseline
ELT	530	-	111,309	-	111,839
LLT	517	25,489	4,852	26,006	5,369

Note: The *NEPA point of comparison* compares total CO_2e emissions after implementation of Alternative 2C to the No Action Alternative, whereas the *CEQA baseline* compares total CO_2e emissions to Existing Conditions.

Table 22-59 summarizes equipment CO_2e emissions that would be generated in the BAAQMD,SMAQMD, and YSAQMD. Table 22-87 summarizes equipment CO_2e associated with operational activities in SJVAPCD. The table does not include emissions from SWP pumping as these emissions would be generated by power plants located throughout the state (see discussion preceding this impact analysis). GHG emissions presented in Tables 22-58 and 22-86 are therefore provided for information purposes only.

Table 22-87. Equipment CO_2e Emissions from Operation and Maintenance of Alternative 2C in SJVAPCD (metric tons/year)[a]

Air District	ELT	LLT
SJVAPCD	4	4

[a] Emissions do not include emissions generated by increased SWP pumping.

SWP Operational and Maintenance GHG Emissions Analysis

Alternative 2C would add approximately 1,178 GWh[36] of additional net electricity demand to operation of the SWP each year assuming 2060 conditions. Conditions at 2060 (LLT) are used for this analysis because they yield the largest potential additional net electricity requirements and therefore represent the largest potential impact. This 1,178 GWh is based on assumptions of future conditions and operations and includes all additional energy required to operate the project with BDCP Alternative 2C including any additional energy associated with additional water being moved through the system.

[36] Estimated net energy demand differs slightly from what is presented in Chapter 21, *Energy*. This is because the above analysis includes energy needed for transmission and distribution of water along the Valley String, which is required to enable a comparison with the assumptions in DWR's CAP.

In the CAP, DWR developed estimates of historical, current, and future GHG emissions. Figure 22-13 shows those emissions as they were projected in the CAP and how those emissions projections would change with the additional electricity demands needed to operate the SWP with the addition of BDCP Alternative 2C. As shown in Figure 22-13, in 2024, the year BDCP Alternative 2C is projected to go online, DWR total emissions jump from around 912,000 metric tons of CO_2e to over 1.4 million metric tons of CO_2e. This elevated level is approximately 160,000 metric tons of CO_2e above DWR's designated GHG emissions reduction trajectory (red line, which is the linear interpolation between DWR's 2020 GHG emissions goal and DWR's 2050 GHG emissions goal.) The projection indicates that after the initial jump in emissions, existing GHG emissions reduction measures would bring the elevated GHG emissions level back down below DWR's GHG emissions reduction trajectory by 2037 and that DWR would still achieve its GHG emission reduction goal by 2050.

Because employing only DWR's existing GHG emissions reduction measures would result in a large initial increase in emissions and result in DWR emissions exceeding the emissions reduction trajectory for several years, DWR will take additional actions to reduce GHG emissions if BDCP Alternative 2C is implemented.

The CAP sets forth DWR's plan to manage its activities and operations to achieve its GHG emissions reduction goals. The CAP commits DWR to monitoring its emissions each year and evaluating its emissions every five years to determine whether it is on a trajectory to achieve its GHG emissions reduction goals. If it appears that DWR will not meet the GHG emission reduction goals established in the plan, DWR may make adjustments to existing emissions reduction measures, devise new measures to ensure achievement of the goals, or take other action. Given the scale of additional emissions that BDCP Alternative 2C would add to DWR's total GHG emissions, DWR has evaluated the most likely method that it would use to compensate for such an increase in GHG emissions: modification of DWR's REPP. The DWR REPP (GHG emissions reduction measure OP-1 in the CAP) describes the amount of additional renewable energy that DWR expects to purchase each year to meet its GHG emissions reduction goals. The REPP lays out a long-term strategy for renewable energy purchases, though actual purchases of renewable energy may not exactly follow the schedule in the REPP and will ultimately be governed by actual operations, measured emissions, and contracting.

Table 22-88 below shows how the REPP could be modified to accommodate BDCP Alternative 2C, and shows that additional renewable energy resources could be purchased during years 2022–2025 over what was programmed in the original REPP. The net result of this change is that by 2026 DWR's energy portfolio would contain nearly 1,042 GWh of renewable energy (in addition to hydropower generated at SWP facilities). This amount is considerably larger than the amount called for in the original DWR REPP (1,112 compared to 792). In later years, 2031–2050, DWR would bring on slightly fewer additional renewable resources than programmed in the original REPP. Figure 22-14 shows how this modified Renewable Energy Procurement Plan would affect DWR's projected future emissions with BDCP Alternative 2C.

Table 22-88. Changes in Expected Renewable Energy Purchases 2011–2050 (Alternative 2C)

	Additional GWh of Renewable Power Purchased (Above previous year)	
Year(s)	Original CAP	New CAP
2011–2020	36	36
2021	72	72
2022–2025	72	152
2026–2030	72	72
2031–2040	108	63
2041–2050	144	74
Total Cumulative	52,236	51,041

As shown in the analysis above and consistent with the analysis contained in the CAP and associated Initial Study and Negative Declaration for the CAP, BDCP Alternative 2C would not adversely affect DWR's ability to achieve the GHG emissions reduction goals set forth in the CAP. Further, Alternative 2C would not conflict with any of DWR's specific action GHG emissions reduction measures and implements all applicable project level GHG emissions reduction measures as set forth in the CAP. BDCP Alternative 2C is therefore consistent with the analysis performed in the CAP. There would be no adverse effect.

***CEQA Conclusion*:** SWP GHG emissions currently are below 1990 levels and achievement of the goals of the CAP means that total DWR GHG emissions will be reduced to 50% of 1990 levels by 2020 and to 80% of 1990 levels by 2050. The implementation of BDCP Alternative 2C would not affect DWR's established emissions reduction goals or baseline (1990) emissions and therefore would not result in a change in total DWR emissions that would be considered significant. Prior adoption of the CAP by DWR already provides a commitment on the part of DWR to make all necessary modifications to DWR's REPP (as described above) or any other GHG emission reduction measure in the CAP that are necessary to achieve DWR's GHG emissions reduction goals. Therefore no amendment to the approved CAP is necessary to ensure the occurrence of the additional GHG emissions reduction activities needed to account for BDCP-related operational emissions. The effect of BDCP Alternative 2C with respect to GHG emissions is less than cumulatively considerable and therefore less than significant. No mitigation is required.

Impact AQ-23: Generation of Cumulative Greenhouse Gas Emissions from Increased CVP Pumping as a Result of Implementation of CM1

NEPA Effects: As previously discussed, DWR's CAP cannot be used to evaluate environmental impacts associated with increased CVP pumping, as emissions associated with CVP are not under DWR's control and are not included in the CAP. Accordingly, GHG emissions resulting from increased CVP energy use are evaluated separately from GHG emissions generated as a result of SWP energy use.

Under Alternative 2C, operation of the CVP yields the generation of clean, GHG emissions-free, hydroelectric energy. This electricity is sold into the California electricity market or directly to energy users. Analysis of the No Action Alternative indicates that the CVP generates and will continue to generate all of the electricity needed to operate the CVP system and approximately 3,500 GWh of excess hydroelectric energy that would be sold to energy users throughout California. Implementation of Alternative 2C, however, would result in an increase of 103 GWh in the demand for CVP generated electricity, which would result in a reduction of 103 GWh or electricity available for sale from the CVP to electricity users. This reduction in the supply of GHG emissions-free electricity to the California electricity users could result in a potential indirect effect of the project, as these electricity users would have to acquire substitute electricity supplies that may result in GHG emissions (although additional conservation is also a possible outcome as well).

It is unknown what type of power source (e.g., renewable, natural gas) would be substituted for CVP electricity or if some of the lost power would be made up with higher efficiency. Given State mandates for renewable energy and incentives for energy efficiency, it is possible that a considerable amount of this power would be replaced by renewable resources or would cease to be needed as a result of higher efficiency. However, to ensure a conservative analysis, indirect emissions were quantified for the entire quantity of electricity (103 GWh) using the current and future statewide energy mix (adjusted to reflect RPS) (please refer to Appendix 22A, *Air Quality Analysis Methodology,* for additional detail on quantification methods).

Substitution of 103 GWh of electricity with a mix of sources similar to the current statewide mix would result in emissions of 28,851 metric tons of CO_2e; however, under expected future conditions (after full implementation of the RPS), emissions would be 22,419 metric tons of CO_2e.

Use of CVP hydroelectricity to meet increased electricity demand from operation of CVP facilities associated with Alternative 2C would reduce available CVP hydroelectricity to other California electricity users. Substitution of the lost electricity with electricity from other sources could indirectly result in an increase of GHG emissions that is comparable or larger than the level of GHG emissions that trigger mandatory GHG reporting for major facilities. As a result, these emissions could contribute to a cumulatively considerable effect and are therefore adverse. However, these emissions would be caused by dozens of independent electricity users, who had previously bought CVP power, making decisions about different ways to substitute for the lost power. These decisions are beyond the control of Reclamation or any of the other BDCP Lead Agencies. Further, monitoring to determine the actual indirect change in emissions as a result of BDCP actions would not be feasible. In light of the impossibility of predicting where any additional emissions would occur, as well as Reclamation's lack of regulatory authority over the purchasers of power in the open market, no workable mitigation is available or feasible.

***CEQA Conclusion*:** Operation of the CVP is a federal activity beyond the control of any State agency such as DWR, and the power purchases by private entities or public utilities in the private marketplace necessitated by a reduction in available CVP-generated hydroelectric power are beyond the control of the State, just as they are beyond the control of Reclamation. For these reasons, there are no feasible mitigation measures that could reduce this potentially significant indirect impact, which is solely attributable to operations of the CVP and not the SWP, to a less than significant level. This impact is therefore determined to be significant and unavoidable.

Impact AQ-24: Generation of Regional Criteria Pollutants from Implementation of CM2–CM11

NEPA Effects: Table 22-29 summarizes potential construction and operational emissions that may be generated by implementation of CM2–CM11. See the discussion of Impact AQ-24 under Alternative 1A.

Criteria pollutants from restoration and enhancement actions could exceed applicable general conformity *de minimis* levels and applicable local thresholds. The effect would vary according to the equipment used in construction of a specific conservation measure, the location, the timing of the actions called for in the conservation measure, and the air quality conditions at the time of implementation; these effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. The effect of increases in emissions during implementation of CM2–CM11 in excess of applicable general conformity *de minimis* levels and air district regional thresholds (Table 22-8) could violate air basin SIPs and worsen existing air quality conditions. Mitigation Measure AQ-24 would be available to reduce this effect, but emissions would still be adverse.

***CEQA Conclusion*:** Construction and operational emissions associated with the restoration and enhancement actions would result in a significant impact if the incremental difference, or increase, relative to Existing Conditions exceeds the applicable local air district thresholds shown in Table 22-8; these effects are expected to be further evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measure AQ-24 would be available to reduce this effect, but may not be sufficient to reduce emissions below applicable air quality management district thresholds (see Table 22-8). Consequently, this impact would be significant and unavoidable.

Mitigation Measure AQ-24: Develop an Air Quality Mitigation Plan (AQMP) to Ensure Air District Regulations and Recommended Mitigation are Incorporated into Future Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-24 under Impact AQ-24 in the discussion of Alternative 1A.

Impact AQ-25: Exposure of Sensitive Receptors to Health Hazards from Localized Particulate Matter, Carbon Monoxide, and Diesel Particulate Matter from Implementation of CM2–CM11

NEPA Effects: The potential for Alternative 2C to expose sensitive receptors increased health hazards from localized PM, CO, and DPM would be similar to Alternative 1A. Activities shown in Table 22-29 with the greatest potential to have short or long-term air quality impacts are also anticipated to have the greatest potential to expose receptors to substantial pollutant concentrations. The effect would vary according to the equipment used, the location and timing of the actions called for in the conservation measure, the meteorological and air quality conditions at the time of implementation, and the location of receptors relative to the emission source. Potential health effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions.

The effect of increases in PM, CO, or DPM (cancer and non-cancer-risk) in excess of applicable air district thresholds (Table 22-8) at receptor locations could result in adverse health impacts. Mitigation Measures AQ-24 and AQ-25 would be available to reduce this effect.

***CEQA Conclusion*:** Construction and operational emissions associated with the restoration and enhancement actions under Alternative 2C would result in a significant impact if PM, CO, or DPM (cancer and non-cancer-risk) concentrations at receptor locations exceed the applicable local air district thresholds shown in Table 22-8; these effects are expected to be further evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measures AQ-24 and AQ-25 would ensure localized concentrations at receptor locations would be below applicable air quality management district thresholds (see Table 22-8). Consequently, this impact would be less than significant.

Mitigation Measure AQ-24: Develop an Air Quality Mitigation Plan (AQMP) to Ensure Air District Regulations and Recommended Mitigation are Incorporated into Future Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-24 under Impact AQ-24 in the discussion of Alternative 1A.

Mitigation Measure AQ-25: Prepare a Project-Level Health Risk Assessment to Reduce Potential Health Risks from Exposure to Localized DPM and PM Concentrations

Please see Mitigation Measure AQ-25 under Impact AQ-25 in the discussion of Alternative 1A.

Impact AQ-26: Creation of Potential Odors Affecting a Substantial Number of People from Implementation of CM2–CM11

NEPA Effects: The potential for Alternative 2C to expose sensitive receptors increased odors would be similar to Alternative 1A. Accordingly, construction activities associated with CM2-CM11 are not anticipated to result in nuisance odors. Similarly, while restored land uses associated with the program have the potential to generate odors from natural processes, the emissions would be similar in origin and magnitude to the existing land use types in the restored area (e.g., managed wetlands). Moreover, specific odor effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Accordingly, odor-related effects associated with CM2–CM11 would not be adverse.

CEQA Conclusion**:** Alternative 2C would not result in the addition of major odor producing facilities. Diesel emissions during construction could generate temporary odors, but these would quickly dissipate and cease once construction is completed. Increases in wetland, tidal, and upland habitats may increase the potential for odors from natural processes. However, the origin and magnitude of odors would be similar to the existing land use types in the restored area (e.g., managed wetlands). Moreover, specific odor impacts would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Accordingly, the impact of exposure of sensitive receptors to potential odors would be less than significant. No mitigation is required.

Impact AQ-27: Generation of Cumulative Greenhouse Gas Emissions from Implementation of CM2–CM11

NEPA Effects: CM2–CM11 implemented under Alternative 2C would result in local GHG emissions from construction equipment and vehicle exhaust, similar to Alternative 1A. Restoration activities with the greatest potential for emissions include those that break ground and require use of earthmoving equipment. The type of restoration action and related construction equipment use are shown in Table 22-29. Implementing CM2–CM11 would also affect long-term sequestration rates through land use changes, such as conversion of agricultural land to wetlands, inundation of peat soils, drainage of peat soils, and removal or planting of carbon-sequestering plants.

Without additional information on site-specific characteristics associated with each of the restoration components, a complete assessment of GHG flux from CM2–CM11 is currently not possible. The effect of carbon sequestration and CH_4 generation would vary by land use type, season, and chemical and biological characteristics; these effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measures AQ-24 and AQ-27 would be available to reduce this

effect. However, due to the potential for increases in GHG emissions from construction and land use change, this effect would be adverse.

CEQA Conclusion: The restoration and enhancement actions under Alternative 2C could result in a significant impact if activities are inconsistent with applicable GHG reduction plans, do not contribute to a lower carbon future, or generate excessive emissions, relative to other projects throughout the state. These effects are expected to be further evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measures AQ-24 and AQ-27 would be available to reduce this impact, but may not be sufficient to reduce to a less-than-significant level. Consequently, this impact would be significant and unavoidable.

Mitigation Measure AQ-24: Develop an Air Quality Mitigation Plan (AQMP) to Ensure Air District Regulations and Recommended Mitigation are Incorporated into Future Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-24 under Impact AQ-24 in the discussion of Alternative 1A.

Mitigation Measure AQ-27: Prepare a Land Use Sequestration Analysis to Quantify and Mitigate (as Needed) GHG Flux Associated with Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-27 under Impact AQ-27 in the discussion of Alternative 1A.

22.3.3.8 Alternative 3—Dual Conveyance with Pipeline/Tunnel and Intakes 1 and 2 (6,000 cfs; Operational Scenario A)

A total of two intakes would be constructed under Alternative 3. For the purposes of this analysis, it was assumed that Intakes 1–2 would be constructed under Alternative 3. Under this alternative, an intermediate forebay would also be constructed, and the conveyance facility would be a buried pipeline and tunnels (Figures 3-2 and 3-8 in Chapter 3, *Description of Alternatives*).

Construction and operation of Alternative 3 would require the use of electricity, which would be supplied by the California electrical grid. Power plants located throughout the state supply the grid with power, which will be distributed to the Study area to meet project demand. Power supplied by statewide power plants will generate criteria pollutants. Because these power plants are located throughout the state, criteria pollutant emissions associated with Alternative 3 electricity demand cannot be ascribed to a specific air basin or air district within the Study area. Criteria pollutant emissions from electricity consumption, which are summarized in Table 22-89, are therefore provided for informational purposes only and are not included in the impact conclusion.

Table 22-89. Criteria Pollutant Emissions from Electricity Consumption: Construction and Net Project Operations, Alternative 3 (tons/year) [a,b]

Year	Analysis	ROG	CO	NO_X	PM10	PM2.5[c]	SO_2
2016	-	0	0	0	0	0	0
2017	-	0	0	0	0	0	0
2018	-	<1	<1	<1	<1	<1	<1
2019	-	<1	2	<1	<1	<1	1
2020	-	<1	12	1	1	1	5
2021	-	<1	31	2	3	3	13
2022	-	<1	44	3	4	4	18
2023	-	<1	39	3	3	3	16
2024	-	<1	41	3	3	3	17
2025	-	<1	27	2	2	2	12
2026	-	<1	10	1	1	1	4
2027	-	<1	2	<1	<1	<1	1
2028	-	<1	<1	<1	<1	<1	<1
2029	-	<1	<1	<1	<1	<1	<1
ELT	CEQA	1	13	180	15	15	76
LLT	NEPA	2	17	238	20	20	101
LLT	CEQA	1	5	73	6	6	31

NEPA = Compares criteria pollutant emissions after implementation of Alternative 3 to the No Action Alternative.

CEQA = Compares criteria pollutant emissions after implementation of Alternative 3 to Existing Conditions.

[a] Emissions assume implementation of RPS (see Appendix 22A, *Air Quality Analysis Methodology*). Power plants that generate electricity for the proposed project would be subject to local air district permitting requirements, including standards to implement BACT to reduce criteria pollutant emissions.

[b] Because GHG emissions are cumulative (see Section 22.3.2.1) and not evaluated at the local air basin or air district level, they are discussed in Impacts AQ-21 and AQ-22. The GHG analysis for SWP power utilizes actual and forecasted GHG emissions rates for the SWP system, which differs slightly from the above analysis. Statewide grid average emission factors were utilized for the above analysis as criteria pollutant emission factors for SWP were unavailable. Please also note that the above analysis does not account for additional renewable energy that will be procured through modifications to DWR's REPP (see Impact AQ-22). Accordingly, the emissions results presented above represent a conservative assessment of potential criteria pollutant emissions.

[c] Emission factors for PM2.5 are currently unavailable. Consequently, PM2.5 emissions were assumed to equal PM10 emissions. Because PM2.5 represents a fraction of PM10, this approach represents a conservative assessment of PM2.5 emissions from electricity consumption.

Construction activities would generate emissions of ozone precursors (ROG and NO_X), CO, PM10, PM2.5, and SO_2. Table 22-90 summarizes criteria pollutant emissions that would be generated in the BAAQMD, SMAQMD, SJVAPCD, and YSAQMD in pounds per day and tons per year. Emissions estimates include implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*). Although emissions are presented in different units (pounds and tons), the amounts of emissions are identical (i.e., 2,000 pounds is identical to 1 ton). Summarizing emissions in both pounds per day and tons per year is necessary to evaluate project-level effects against the appropriate air district thresholds, which are given in both pounds and tons (see Table 22-8).

As shown in Appendix 22B, *Air Quality Assumptions*, construction activities during several phases will likely occur concurrently. To ensure a conservative analysis, the maximum daily emissions during these periods of overlap were estimated assuming all equipment would operate at the same time—this gives the maximum total project-related air quality impact during construction. Accordingly, the daily emissions estimates represent a conservative assessment of construction impacts. Exceedances of the air district thresholds are shown in underlined text.

1 **Table 22-90. Criteria Pollutant Emissions from Construction of Alternative 3 (pounds/day and tons/year)**

	Maximum Daily Emissions (pounds/day)										Annual Emissions (tons/year)									
	Bay Area Air Quality Management District										Bay Area Air Quality Management District									
	ROG	NOX	CO	PM10			PM2.5			SO_2	ROG	NOX	CO	PM10			PM2.5			SO_2
Year				Exhaust	Dust	Total	Exhaust	Dust	Total					Exhaust	Dust	Total	Exhaust	Dust	Total	
2016	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2017	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2018	8	108	50	1	68	69	1	17	17	1	<1	1	1	<1	1	1	<1	0	0	<1
2019	21	256	143	1	119	120	1	29	30	2	2	14	12	<1	2	2	<1	0	1	<1
2020	32	343	211	2	141	143	2	34	36	3	3	22	20	<1	4	4	<1	1	1	<1
2021	35	371	224	3	157	160	3	38	41	3	4	30	26	<1	6	6	<1	1	1	<1
2022	40	434	248	3	197	199	3	49	52	4	4	33	27	<1	8	8	<1	2	2	<1
2023	99	827	581	7	352	359	7	72	79	7	7	54	44	1	20	21	1	4	4	<1
2024	107	960	621	8	471	479	7	102	110	8	11	80	67	1	26	27	1	5	5	1
2025	99	907	565	6	440	447	6	98	104	8	7	48	41	<1	17	17	<1	3	3	<1
2026	64	654	382	5	381	385	5	86	90	7	5	37	30	<1	15	16	<1	3	3	<1
2027	55	554	325	6	340	346	6	76	82	7	3	20	16	<1	13	13	<1	2	3	<1
2028	18	277	116	1	263	264	1	58	60	3	0	2	1	<1	4	4	<1	1	1	<1
2029	8	154	49	1	113	113	1	29	30	2	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Thresholds	*54*	*54*	-	*82*	*BMPs*	-	*54*	*BMPs*	-	-	-	-	-	-	-	-	-	-	-	-
	Sacramento Metropolitan Air Quality Management District										Sacramento Metropolitan Air Quality Management District									
	ROG	NOX	CO	PM10			PM2.5			SO_2	ROG	NOX	CO	PM10			PM2.5			SO_2
Year				Exhaust	Dust	Total	Exhaust	Dust	Total					Exhaust	Dust	Total	Exhaust	Dust	Total	
2016	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2017	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2018	32	364	216	6	95	101	6	16	22	1	1	12	8	<1	6	6	<1	1	1	<1
2019	47	483	327	5	244	249	5	41	46	2	3	16	21	<1	17	18	<1	2	3	<1
2020	66	733	460	8	306	314	8	49	57	3	6	50	42	1	26	26	1	3	4	<1
2021	75	852	607	9	394	402	8	64	72	3	8	70	61	1	37	38	1	5	6	<1
2022	108	1,143	895	10	480	489	10	77	86	6	11	87	95	1	44	45	1	6	7	<1
2023	193	1,733	1,402	20	655	673	19	103	121	13	19	145	147	2	58	60	2	8	10	1
2024	323	2,920	2,031	38	903	941	37	154	191	17	25	187	173	3	67	69	3	10	12	1
2025	292	2,786	1,862	35	890	925	34	149	182	16	22	158	141	3	45	48	3	7	9	1
2026	228	1,909	1,285	26	565	591	25	107	132	12	21	144	126	3	41	43	2	6	9	<1
2027	245	2,151	1,454	32	622	655	31	114	145	16	17	124	104	2	45	47	2	7	9	1
2028	85	816	522	6	410	416	6	77	82	5	4	25	25	<1	23	23	<1	3	4	<1
2029	22	331	164	2	171	173	2	38	40	3	<1	3	3	<1	3	3	<1	<1	<1	<1
Thresholds	-	*85*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Year	San Joaquin Valley Air Pollution Control District										San Joaquin Valley Air Pollution Control District									
	ROG	NOX	CO	PM10			PM2.5			SO2	ROG	NOX	CO	PM10			PM2.5			SO2
				Exhaust	Dust	Total	Exhaust	Dust	Total					Exhaust	Dust	Total	Exhaust	Dust	Total	
2016	0	0	0	0	29	29	0	4	4	0	0	0	0	0	2	2	0	<1	<1	0
2017	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2018	23	106	157	2	95	97	2	12	14	1	1	5	9	<1	10	10	<1	1	1	<1
2019	76	590	551	6	157	164	6	20	26	2	9	64	61	1	15	15	1	2	2	<1
2020	150	1,095	1,054	14	250	263	13	31	44	4	15	110	108	1	28	29	1	3	5	<1
2021	213	1,631	1,501	23	572	595	22	67	88	5	24	171	171	2	44	46	2	5	7	1
2022	157	1,052	1,164	12	222	234	12	28	40	3	22	146	165	2	26	28	2	3	5	<1
2023	138	870	1,010	9	144	153	9	19	28	3	20	119	145	1	14	15	1	2	3	<1
2024	135	812	970	8	123	131	8	17	24	3	19	109	133	1	13	14	1	2	3	<1
2025	113	661	758	6	98	104	6	14	20	2	12	72	82	1	11	12	1	1	2	<1
2026	74	466	474	4	61	65	4	7	11	2	5	29	28	<1	2	3	<1	<1	1	<1
2027	2	2	7	6	1	7	6	<1	6	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
2028	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2029	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Thresholds	-	-	-	-	-	-	-	-	-	-	*10*	*10*	-	-	-	*15*	-	-	*15*	-

Year	Yolo Solano Air Quality Management District										Yolo Solano Air Quality Management District									
	ROG	NOX	CO	PM10			PM2.5			SO2	ROG	NOX	CO	PM10			PM2.5			SO2
				Exhaust	Dust	Total	Exhaust	Dust	Total					Exhaust	Dust	Total	Exhaust	Dust	Total	
2016	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2017	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2018	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2019	3	84	17	<1	23	23	<1	6	6	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
2020	3	84	18	<1	23	23	<1	6	6	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
2021	5	132	29	<1	37	37	<1	9	10	1	<1	2	1	<1	1	1	<1	<1	<1	<1
2022	8	211	48	1	61	61	1	16	16	1	<1	8	2	<1	2	2	<1	1	1	<1
2023	10	225	60	1	81	82	1	21	22	2	<1	7	2	<1	2	3	<1	1	1	<1
2024	10	220	60	1	81	82	1	21	22	2	<1	7	2	<1	2	2	<1	1	1	<1
2025	10	206	57	1	78	78	1	20	21	2	<1	4	1	<1	2	2	<1	<1	<1	<1
2026	8	156	45	1	60	61	1	16	16	1	<1	4	1	<1	2	2	<1	<1	<1	<1
2027	8	152	44	1	60	61	1	16	16	1	<1	4	1	<1	2	2	<1	<1	<1	<1
2028	5	101	30	<1	41	41	<1	11	11	1	<1	4	1	<1	2	2	<1	<1	<1	<1
2029	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Thresholds	-	-	-	-	-	*80*	-	-	-	-	*10*	*10*	-	-	-	-	-	-	-	-

Operation and maintenance activities under Alternative 3 would result in emissions of ROG, NO_X, CO, PM10, PM2.5, and SO_2. Emissions were quantified for both ELT and LLT conditions, although activities would take place annually until project decommissioning. Future emissions, in general, are anticipated to lessen because of continuing improvements in vehicle and equipment engine technology.

Table 22-91 summarizes criteria pollutant emissions associated with operation of Alternative 3 in the BAAQMD, SMAQMD, and SJVAPCD in pounds per day and tons per year (no operational emissions would be generated in the YSAMQD). Although emissions are presented in different units (pounds and tons), the amounts of emissions are identical (i.e., 2,000 pounds is identical to 1 ton). Summarizing emissions in both pounds per day and tons per year is necessary to evaluate project-level effects against the appropriate air district thresholds, which are given in both pounds and tons (see Table 22-8).

Table 22-91. Criteria Pollutant Emissions from Operation of Alternative 3 (pounds per day and tons per year)

	Maximum Daily Emissions (pounds/day)						Annual Emissions (tons/year)					
	Bay Area Air Quality Management District						Bay Area Air Quality Management District					
Condition	ROG	NO_X	CO	PM10	PM2.5	SO_2	ROG	NO_X	CO	PM10	PM2.5	SO_2
ELT	3	19	32	6	2	0	0.01	0.08	0.14	0.02	0.01	0.00
LLT	3	16	31	6	1	0	0.01	0.07	0.14	0.02	0.01	0.00
Thresholds	*54*	*54*	-	*82*	*82*	-	-	-	-	-	-	
	Sacramento Metropolitan Air Quality Management District						Sacramento Metropolitan Air Quality Management District					
Condition	ROG	NO_X	CO	PM10	PM2.5	SO_2	ROG	NO_X	CO	PM10	PM2.5	SO_2
ELT	4	22	40	7	2	0	0.10	0.61	1.23	0.21	0.06	0.00
LLT	3	19	38	7	2	0	0.09	0.51	1.17	0.20	0.05	0.00
Thresholds	*65*	*65*	-	-	-	-	-	-	-	-	-	-
	San Joaquin Valley Air Pollution Control District						San Joaquin Valley Air Pollution Control District					
Condition	ROG	NO_X	CO	PM10	PM2.5	SO_2	ROG	NO_X	CO	PM10	PM2.5	SO_2
ELT	3	19	36	6	2	0	0.01	0.07	0.13	0.02	0.00	0.00
LLT	3	16	33	6	1	0	0.01	0.06	0.12	0.01	0.00	0.00
Thresholds	-	-	-	-	-	-	*10*	*10*	-	*15*	*15*	-

Impact AQ-1: Generation of Criteria Pollutants in Excess of the SMAQMD Regional Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: As shown in Table 22-90, construction emissions would exceed SMAQMD's daily NO_X threshold for all years between 2018 and 2029, even with implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*). Since NO_X is a precursor to ozone and PM, exceedances of SMAQMD's daily NO_X threshold could impact both regional ozone and PM formation, which could worsen regional air quality and air basin attainment of the NAAQS and CAAQS.

While equipment could operate at any work area identified for this alternative, the highest level of NO_X emissions in the SMAQMD is expected to occur at those sites where the duration and intensity of construction activities would be greatest. This includes all intake and intake pumping plant sites along the east bank of the Sacramento River, as well as the intermediate forebay (and pumping plant) site west of South Stone Lake and east of the Sacramento River.

Environmental commitments will reduce construction-related emissions however, as shown in Table 22-90, NO_X emissions would still exceed SMAQMD's regional thresholds identified in Table 22-8 and would result in an adverse effect to air quality. Mitigation Measures AQ-1a and AQ-1b would be available to reduce NO_X emissions, and would thus address regional effects related to secondary ozone and PM formation.

CEQA Conclusion**:** NO_X emissions generated during construction would exceed SMAQMD threshold identified in Table 22-8. Since NO_X is a precursor to ozone and PM, exceedances of SMAQMD's daily NO_X threshold could impact both regional ozone and PM formation. SMAQMD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS or NAAQS. The impact of generating NO_X emissions in excess of local air district thresholds would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. This would be a significant impact. Mitigation Measures AQ-1a and AQ-1b would be available to reduce NO_X emissions to a less-than-significant level by offsetting emissions to quantities below SMAQMD CEQA thresholds (see Table 22-8).

Mitigation Measure AQ-1a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-1a under Impact AQ-1 in the discussion of Alternative 1A.

Mitigation Measure AQ-1b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-1b under Impact AQ-1 in the discussion of Alternative 1A.

Impact AQ-2: Generation of Criteria Pollutants in Excess of the YSAQMD Regional Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: As shown in Table 22-90, construction emissions would exceed YSAQMD regional PM10 threshold in 2023 and 2024, even with implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*). Exceedances of YSAQMD's PM10 threshold could impede attainment of the NAAQS and CAAQS for PM10. All emissions generated within YSAQMD are a result of haul truck movement for equipment and material delivery.

Environmental commitments outlined in Appendix 3B, *Environmental Commitments,* will reduce construction-related emissions; however, as shown in Table 22-90, PM10 emissions would still exceed the applicable YSAQMD thresholds identified in Table 22-8 and result in an adverse regional effect to air quality. Mitigation Measures AQ-1a and AQ-1b are available to reduce PM10 emissions.

CEQA Conclusion**:** Emissions of PM10 generated during construction would exceed YSAQMD's regional thresholds identified in Table 22-8. Exceedances of YSAQMD's PM10 threshold could impede attainment of the NAAQS and CAAQS for PM10. YSAQMD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS or NAAQS. The impact of generating PM10 in excess of local air district regional thresholds would therefore violate applicable air quality standards in the study area and could contribute to or worsen an existing air quality conditions. This would be a significant impact. Mitigation Measures AQ-1a and AQ-1b would be available to reduce PM10 emissions to a less-than-significant level by offsetting emissions to quantities below YSAQMD CEQA thresholds (see Table 22-8).

Mitigation Measure AQ-1a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-1a under Impact AQ-1 in the discussion of Alternative 1A.

Mitigation Measure AQ-1b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-1b under Impact AQ-1 in the discussion of Alternative 1A.

Impact AQ-3: Generation of Criteria Pollutants in Excess of the BAAQMD Regional Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: As shown in Table 22-90, construction emissions would exceed BAAQMD's daily thresholds for the following pollutants and years, even with implementation of environmental commitments. All other pollutants would be below air district thresholds and therefore would not result in an adverse air quality effect.

- ROG: 2023–2027
- NO_X: 2018–2029

Since ROG and NO_X are precursors to ozone and NO_X is a precursor to PM, exceedances of BAAQMD's ROG and NO_X thresholds could impact both regional ozone and PM formation, which could worsen regional air quality and air basin attainment of the NAAQS and CAAQS.

While equipment could operate at any work area identified for this alternative, the highest level of ROG and NO_X emissions in the BAAQMD are expected to occur at those sites where the duration and intensity of construction activities would be greatest, including the site of the Byron Tract Forebay adjacent to and south of Clifton Court Forebay.

Environmental commitments outlined in Appendix 3B, *Environmental Commitments,* will reduce construction-related emissions; however, as shown in Table 22-80, ROG and NO_X emissions would still exceed BAAQMD's regional thresholds identified in Table 22-8 and would result in an adverse effect to air quality. Mitigation Measures AQ-3a and AQ-3b are available to reduce ROG and NO_X emissions, and would thus address regional effects related to secondary ozone and PM formation.

***CEQA Conclusion*:** Emissions of ROG and NO_X generated during construction would exceed BAAQMD regional thresholds identified in Table 22-8. Since ROG and NO_X are precursors to ozone and NO_X is a precursor to PM, exceedances of BAAQMD's ROG and NO_X thresholds could impact both regional ozone and PM formation. BAAQMD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS or NAAQS. The impact of generating ROG and NO_X emissions in excess of BAAQMD's thresholds would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. This would be a significant impact. Mitigation Measures AQ-3a and AQ-3b would be available to reduce ROG and NO_X emissions to a less-than-significant level by offsetting emissions to quantities below BAAQMD CEQA thresholds (see Table 22-8).

Mitigation Measure AQ-3a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within BAAQMD/SFBAAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable BAAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-3a under Impact AQ-3 in the discussion of Alternative 1A.

Mitigation Measure AQ-3b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the BAAQMD/SFBAAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable BAAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-3b under Impact AQ-3 in the discussion of Alternative 1A.

Impact AQ-4: Generation of Criteria Pollutants in Excess of the SJVAPCD Regional Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: As shown in Table 22-90, construction emissions would exceed SJVAPCD's annual thresholds for the following pollutants and years, even with implementation of environmental commitments. All other pollutants would be below air district thresholds and therefore would not result in an adverse air quality effect.

- ROG: 2020–2025
- NO_X: 2019–2026
- PM10: 2019–2023

Since ROG and NO_X are precursors to ozone and NO_X is a precursor to PM, exceedances of SJVAPCD's ROG and NO_X thresholds could impact both regional ozone and PM formation, which could worsen regional air quality and air basin attainment of the NAAQS and CAAQS. Similarly, exceedances of SJVAPCD's PM10 threshold could impede attainment of the NAAQS and CAAQS for PM10.

While equipment could operate at any work area identified for this alternative, the highest level of ROG, NO_X, and PM10 emissions in the SJVAPCD is expected to occur at those sites where the duration and intensity of construction activities would be greatest. This includes all temporary and permanent utility sites, as well as all construction sites along the pipeline/tunnel conveyance alignment. For a map of the proposed tunnel alignment, see Mapbook Figure M3-1.

Environmental commitments outlined in Appendix 3B, *Environmental Commitments,* will reduce construction-related emissions; however, as shown in Table 22-90, ROG, NO_X, and PM10 emissions would still exceed SJVAPCD's regional thresholds identified in Table 22-8 and would result in an adverse effect to air quality. Mitigation Measures AQ-4a and AQ-4b are available to reduce ROG, NO_X, and PM10 emissions, and would thus address regional effects related to secondary ozone and PM formation.

CEQA Conclusion: Emissions of ROG, NO_X, and PM10generated during construction would exceed SJVAPCD's regional significance threshold identified in Table 22-8. Since ROG and NO_X are precursors to ozone and NO_X is a precursor to PM, exceedances of SJVAPCD's ROG and NO_X thresholds could impact both regional ozone and PM formation, which could worsen regional air quality and air basin attainment of the NAAQS and CAAQS. Similarly, exceedances of SJVAPCD's PM10 threshold could impede attainment of the NAAQS and CAAQS for PM10. SJVAPCD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS or NAAQS. The impact of generating ROG, NO_X, and PM10 emissions in excess of local air district thresholds would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. This would be a significant impact. Mitigation Measures AQ-4a and AQ-4b would be available to reduce ROG, NO_X, and PM10emissions to a less-than-significant level by offsetting emissions to quantities below SJVAPCD CEQA thresholds (see Table 22-8).

Mitigation Measure AQ-4a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4a under Impact AQ-4 in the discussion of Alternative 1A.

Mitigation Measure AQ-4b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4b under Impact AQ-4 in the discussion of Alternative 1A.

Impact AQ-6: Generation of Criteria Pollutants in Excess of the SMAQMD Regional Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance in SMAQMD include both routine activities and yearly maintenance. Daily activities at all pumping plants and intakes are covered by maintenance, management, repair, and operating crews. Yearly maintenance would include annual inspections, as well as tunnel dewatering and sediment removal (see Appendix 22A, *Air Quality Analysis Methodology,* for additional detail). The highest concentration of operational emissions in the SMAQMD are expected at intake and intake pumping plant sites along the east bank of the Sacramento River, as well as at the intermediate forebay (and pumping plant) site west of South Stone Lake and east of the Sacramento River. As shown in Table 22-91, operation and maintenance activities under Alternative 3 would not exceed SMAQMD's regional thresholds of significance and there would be no adverse effect (see Table 22-8). Accordingly, project operations would not contribute to or worsen existing air quality exceedances. There would be no adverse effect.

CEQA Conclusion: Emissions generated during operation and maintenance activities would not exceed SMAQMD regional thresholds for criteria pollutants. SMAQMD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Because project operations would not exceed SMAQMD regional thresholds, the impact would be less than significant. No mitigation is required.

Impact AQ-6: Generation of Criteria Pollutants in Excess of the YSAQMD Regional Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Alternative 3 would not construct any permanent features in the YSAQMD that would require routine operations and maintenance. No operational emissions would be generated in the YSAQMD. Consequently, operation of Alternative 3 would neither exceed the YSAQMD thresholds of significance nor result in an adverse effect to air quality.

***CEQA Conclusion*:** Operational emissions generated by the alternative would not exceed YSAQMD's thresholds of significance. This impact would be less than significant. No mitigation is required.

Impact AQ-7: Generation of Criteria Pollutants in Excess of the BAAQMD Regional Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance in BAAQMD include annual inspections, tunnel dewatering, and sediment removal (see Appendix 22A, *Air Quality Analysis Methodology,* for additional detail). The highest concentration of operational emissions in the BAAQMD are expected at the Byron Tract Forebay (including control gates), which is adjacent to and south of Clifton Court Forebay. As shown in Table 22-91, operation and maintenance activities under Alternative 3 would not exceed BAAQMD's regional thresholds of significance (see Table 22-8). Thus, project operations would not contribute to or worsen existing air quality exceedances. There would be no adverse effect.

***CEQA Conclusion*:** Emissions generated during operation and maintenance activities would not exceed BAAQMD regional thresholds for criteria pollutants. The BAAQMD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district thresholds would violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Because project operations would not exceed BAAQMD regional thresholds, the impact would be less than significant. No mitigation is required.

Impact AQ-8: Generation of Criteria Pollutants in Excess of the SJVAPCD Regional Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance in SJVAPCD include annual inspections and tunnel dewatering (see Appendix 22A, *Air Quality Analysis Methodology,* for additional detail). The highest concentration of operational emissions in the SJVPACD is expected at routine inspection sites along the pipeline/tunnel conveyance alignment. For a map of the proposed tunnel alignment, see Mapbook Figure M3-1. As shown in Table 22-91, operation and maintenance activities under Alternative 3 would not exceed SJVAPCD's regional thresholds of significance (see Table 22-8). Accordingly, project operations would not contribute to or worsen existing air quality exceedances. There would be no adverse effect.

CEQA Conclusion: Emissions generated during operation and maintenance activities would not exceed SJVAPCD's regional thresholds of significance. The SJVAPCD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district thresholds would violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Because project operations would not exceed regional SJVAPCD thresholds, the impact would be less than significant. No mitigation is required.

Impact AQ-9: Exposure of Sensitive Receptors to Health Hazards from Localized Particulate Matter in Excess of SMAQMD's Health-Based Concentration Thresholds

NEPA Effects: Alternative 3 involves the development of three less intakes (approximately 60% volumetric reduction) as compared to Alternative 1A. As such, emissions generated by construction of Alternative 3 would be lower than Alternative 1A due to less construction activities. Localized health risk impacts resulting from construction of Intakes 3, 4, and 5 would be less or not occur due to absence in the development of these project features. Based on the emissions inventory conducted for the air quality analysis, the development of Alternative 3 would result in 36% less PM10 emissions and 35% less PM2.5 emissions, as compared with Alternative 1A.

All annual PM10 and PM2.5 concentrations were found to be less than SMAQMD's annual thresholds for Alternative 1A. Because Alternative 3 would require less construction activity and generate fewer emissions than Alternative 1A, annual PM10 and PM2.5 concentrations from the development of Alternative 3 would also be less than the respective SMAQMD annual thresholds. However, as shown in Table 22-14, the maximum predicted 24-hour PM10 concentration for Alternative 1A would exceed SMAQMD's threshold of 2.5 $\mu g/m^3$. The modeled exceedances occur at 225 receptor locations near intakes and intake work areas. Because Alternative 3 would not involve the development of Intakes 3, 4, and 5, emissions contributions from these intakes would not occur. However, it is anticipated that Alternative 3 would still result in 24-hour PM10 exceedances, but primarily in the vicinity of Intakes 1 and 2, and at fewer receptor locations than Alternative 1A. The exceedances would be temporary and occur intermittently due to soil disturbance.

DWR has identified several environmental commitments to reduce construction-related particulate matter in the SMAQMD (see Appendix 3B, *Environmental Commitments*). While these commitments will reduce localized particulate matter emissions, concentrations at adjacent receptor locations would still exceed SMAQMD's 24-hour PM10 threshold. Receptors exposed to PM10 concentrations in excess of SMAQMD's threshold could experience increased risk for adverse human health effects. Mitigation Measure AQ-9 is available to address this effect.

CEQA Conclusion: Respirable particulates pose a human health hazard by bypassing the defenses within the mucous ciliary system and entering deep lung tissue. Construction of Alternative 3 would result in the short-term exposure of receptors to PM10 concentrations that exceed SMAQMD threshold. This would be a significant impact. Mitigation Measure AQ-9 outlines a tiered strategy to reduce PM10 concentrations and public exposure to a less-than-significant level.

Mitigation Measure AQ-9: Implement Measures to Reduce Re-Entrained Road Dust and Receptor Exposure to PM2.5 and PM10

Please see Mitigation Measure AQ-9 under Impact AQ-9 in the discussion of Alternative 1A.

Impact AQ-10: Exposure of Sensitive Receptors to Health Hazards from Localized Particulate Matter in Excess of YSAQMD's Health-Based Concentration Thresholds

NEPA Effects: Table 22-15 under Alternative 1A shows that the maximum predicted PM2.5 and PM10 concentrations are less than YSAQMD's adopted thresholds. Because Alternative 3 would require less construction activity and generate fewer emissions than Alternative 1A, annual PM10 and PM2.5 concentrations from the development of Alternative 3 would also be less than the respective YSAQMD annual thresholds. The project would also implement all air district recommended onsite fugitive dust controls, such as regular watering. Accordingly, this alternative would not expose sensitive receptors to adverse levels of localized particulate matter concentrations.

CEQA Conclusion**:** Respirable particulates pose a human health hazard by bypassing the defenses within the mucous ciliary system and entering deep lung tissue. Construction of Alternative 1A would result in PM2.5 and PM10 concentrations at receptor locations that are below the significance thresholds established by the YSAQMD. Since Alternative 3 results in fewer overall emissions, localized particulate matter concentrations at analyzed receptors would not result in significant human health impacts. No mitigation is required.

Impact AQ-11: Exposure of Sensitive Receptors to Health Hazards from Localized Particulate Matter in Excess of BAAQMD's Health-Based Concentration Thresholds

NEPA Effects: Table 22-16 under Alternative 1A shows that the maximum predicted PM2.5 concentrations are less than BAAQMD's adopted thresholds. Because Alternative 3 would require less construction activity and generate fewer emissions than Alternative 1A, PM2.5 concentrations from the development of Alternative 3 would also be less than the respective BAAQMD annual thresholds. The project would also implement all air district-recommended onsite fugitive dust controls, such as regular watering. Accordingly, this alternative would not expose sensitive receptors to adverse levels of localized particulate matter concentrations.

CEQA Conclusion**:** Respirable particulates pose a human health hazard by bypassing the defenses within the mucous ciliary system and entering deep lung tissue. Construction of Alternative 1A would result in PM2.5 concentrations at receptor locations that are below the significance thresholds established by the BAAQMD. Since Alternative 3 results in fewer overall emissions, localized particulate matter concentrations at analyzed receptors would not result in significant human health impacts. No mitigation is required.

Impact AQ-12: Exposure of Sensitive Receptors to Health Hazards from Localized Particulate Matter in Excess of SJVAPCD's Health-Based Concentration Thresholds

NEPA Effects: Table 22-17 under Alternative 1A shows that with exception of 24-hour PM10, maximum predicted PM2.5 and PM10 concentrations are less than SJVAPCD's adopted thresholds. The 24-hour PM10 concentrations attributable to the project would exceed the SJVAPCD's significance threshold at four receptor locations. Emissions from the tunnel construction activities and concrete batch plant contribute to the exceedance at this location. Although Alternative 3 would result in less construction activities than Alternative 1A, it is anticipated that receptors exposed to emissions from the concrete batch plant and tunnel activities would remain impacted. Accordingly, this alternative would expose a sensitive receptor to adverse levels of localized particulate matter concentrations. Mitigation Measure AQ-9 is available to address this effect.

***CEQA Conclusion*:** Respirable particulates pose a human health hazard by bypassing the defenses within the mucous ciliary system and entering deep lung tissue. Construction of Alternative 3 would result in the short-term exposure of receptors to PM10 concentrations that exceed SJVAPCD's threshold. This would be a significant impact. Mitigation Measure AQ-9 outlines a tiered strategy to reduce PM10 concentrations and public exposure to a less-than-significant level.

Mitigation Measure AQ-9: Implement Measures to Reduce Re-Entrained Road Dust and Receptor Exposure to PM2.5 and PM10

Please see Mitigation Measure AQ-9 under Impact AQ-9 in the discussion of Alternative 1A.

Impact AQ-13: Exposure of Sensitive Receptors to Health Hazards from Localized Carbon Monoxide

NEPA Effects: Continuous engine exhaust may elevate localized CO concentrations. Receptors exposed to these CO "hot-spots" may have a greater likelihood of developing adverse health effects (as described in Section 22.1.2). CO hot-spots are typically observed at heavily congested intersections where a substantial number of gasoline-powered vehicles idle for prolonged durations throughout the day. Construction sites are less likely to result in localized CO hot-spots due to the nature of construction activities (Sacramento Metropolitan Air Quality Management District 2014), which normally utilize diesel-powered equipment for intermittent or short durations. Moreover, construction sites must comply with the Occupational Safety and Health Administration's (OSHA) CO exposure standards for onsite workers. Unlike regional pollutants (e.g., ROG and NO_X), CO concentrations also dissipate as a function of distance and will therefore be lower at offsite receptor locations. Accordingly, given that construction activities typically do not result in CO hot-spots, onsite concentrations must comply with OSHA standards, and CO levels dissipate as a function of distance, equipment-generated CO emissions (see Table 22-90) are not anticipated to result in adverse health hazards to sensitive receptors.

Construction traffic may contribute to increased roadway congestion, which could lead to conditions conducive to CO hot-spot formation. As shown in Table 19-8, the highest peak hour traffic volumes under BPBGPP—12,567 vehicles per hour—would occur on westbound Interstate 80 between Suisun Valley Road and State Route 12.[37] This is about half of the congested traffic volume modeled by BAAQMD (24,000 vehicles per hour) that would be needed to contribute to a localized CO hot-spot, and less than half of the traffic volume modeled by SMAQMD (31,600 vehicles per hour). The BAAQMD's and SMAQMD's CO screening criteria were developed based on County average vehicle fleets that are primarily comprised of gasoline vehicles. Construction vehicles would be predominantly diesel trucks, which generate fewer CO emissions per idle-hour and vehicle mile traveled than gasoline-powered vehicles. Accordingly, the air district screening thresholds provide a conservative evaluation threshold for the assessment of potential CO emissions impacts during construction.

Based on the above analysis, even if all 12,567 vehicles on the modeled traffic segment drove through the same intersection in the peak hour, CO concentrations adjacent to the traveled way

[37] The above volumes are based on the traffic analysis conducted for Alternative 1A. Since few vehicles would be required under Alternative 3, traffic impacts would likely be less than those estimated for Alternative 1A.

would not exceed the CAAQS or NAAQS according to BAAQMD's and SMAQMD's screening criteria. Thus, construction traffic is not anticipated to result in adverse health hazards to sensitive receptors.

CEQA Conclusion: Continuous engine exhaust may elevate localized CO concentrations. Receptors exposed to these CO "hot-spots" may have a greater likelihood of developing adverse health effects. Construction sites are less likely to result in localized CO hot-spots due to the nature of construction activities (Sacramento Metropolitan Air Quality Management District 2014), which normally utilize diesel-powered equipment for intermittent or short durations. Moreover, construction sites must comply with the OSHA CO exposure standards for onsite workers. Accordingly, given that construction activities typically do not result in CO hot-spots, onsite concentrations must comply with OSHA standards, and CO levels dissipate as a function of distance, equipment-generated CO emissions are not anticipated to result in significant health hazards to sensitive receptors. Similarly, peak-hour construction traffic on local roadways would not exceed BAAQMD's or SMAQMD's conservative screening criteria for the formation potential CO hot-spots. This impact would be less than significant. No mitigation is required.

Impact AQ-14: Exposure of Sensitive Receptors to Health Hazards from Diesel Particulate Matter in Excess of SMAQMD's Chronic Non-Cancer and Cancer Risk Thresholds

NEPA Effects: As shown in Table 22-18, Alternative 1A would not exceed the SMAQMD's thresholds for chronic non-cancer hazard or cancer risk. Because Alternative 3 would require less construction activity and generate fewer emissions than Alternative 1A, chronic non-cancer hazard and cancer risk from the development of Alternative 3 would also be less than the respective SMAQMD significance thresholds. Accordingly, this alternative would not expose sensitive receptors to adverse levels of DPM to result in excessive chronic non-cancer hazards or cancer risk.

CEQA Conclusion: DPM generated during construction poses inhalation-related chronic non-cancer hazard and cancer risk if adjacent receptors are exposed to significant concentrations for prolonged durations. DPM generated during Alternative 3 construction would not exceed the SMAQMD's chronic non-cancer hazard or cancer risk threshold. Therefore, this impact for DPM emissions would be less than significant. No mitigation is required.

Impact AQ-15: Exposure of Sensitive Receptors to Health Hazards from Diesel Particulate Matter in Excess of YSAQMD's Chronic Non-Cancer and Cancer Risk Thresholds

NEPA Effects: As shown in Table 22-19, Alternative 1A would not exceed the YSAQMD's thresholds for chronic non-cancer hazard or cancer risk. Because Alternative 3 would require less construction activity and generate fewer emissions than Alternative 1A, chronic non-cancer hazard and cancer risk from the development of Alternative 3 would also be less than the respective YSAQMD significance thresholds. Accordingly, this alternative would not expose sensitive receptors to adverse levels of DPM to result in excessive chronic non-cancer hazards or cancer risk.

CEQA Conclusion: DPM generated during construction poses inhalation-related chronic non-cancer hazard and cancer risk if adjacent receptors are exposed to significant concentrations for prolonged durations. The DPM generated during Alternative 3 construction would not exceed the YSAQMD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial health hazards. Therefore, this impact for DPM emissions would be less than significant. No mitigation is required.

Impact AQ-16: Exposure of Sensitive Receptors to Health Hazards from Diesel Particulate Matter in Excess of BAAQMD's Chronic Non-Cancer and Cancer Risk Thresholds

NEPA Effects: As shown in Table 22-20, Alternative 1A would not exceed the BAAQMD's thresholds for chronic non-cancer hazard; however, it would exceed BAAQMD's cancer risk threshold. The primary emission sources for these exceedances are from a project haul route, control structure work area and potential spoil area. While the impact of Alternative 3 would be less than Alternative 1A, Alternative 3 may still expose the five sensitive receptors to adverse levels of carcinogenic DPM concentrations.

Mitigation Measure AQ-16 would be available to reduce exposure to substantial cancer risk by relocating affected receptors. Although Mitigation Measure AQ-16 would reduce the severity of this effect, the BDCP proponents are not solely responsible for implementation of the measure. If a landowner chooses not to accept DWR's offer of relocation assistance, an adverse effect in the form excess cancer risk above air district thresholds would occur. Therefore, this effect would be adverse. If, however, all landowners accept DWR's offer of relocation assistance, effects would not be adverse.

***CEQA Conclusion*:** DPM generated during construction poses inhalation-related chronic non-cancer hazard and cancer risk if adjacent receptors are exposed to significant concentrations for prolonged durations. The DPM generated during Alternative 3 construction would not exceed the BAAQMD's chronic non-cancer hazard threshold; however, it would exceed the BAAQMD's cancer thresholds. Therefore, this impact for DPM emissions would be significant.

Mitigation Measure AQ-16 would be available to reduce exposure to substantial cancer risk by relocating affected receptors. Although Mitigation Measure AQ-16 would reduce the severity of this effect, the BDCP proponents are not solely responsible for implementation of the measure. If a landowner chooses not to accept DWR's offer of relocation assistance, a significant impact in the form excess cancer risk above air district thresholds would occur. Therefore, this effect would be significant and unavoidable. If, however, all landowners accept DWR's offer of relocation assistance, the impact would be less than significant.

Mitigation Measure AQ-16: Relocate Sensitive Receptors to Avoid Excess Cancer Risk

Please see Mitigation Measure AQ-16 under Impact AQ-16 in the discussion of Alternative 1A.

Impact AQ-17: Exposure of Sensitive Receptors to Health Hazards from Diesel Particulate Matter in Excess of SJVAPCD's Chronic Non-Cancer and Cancer Risk Thresholds

NEPA Effects: Table 22-21 under Alternative 1A shows that the maximum predicted chronic non-cancer hazard and cancer risk associated with the project are less than SJVAPCD's adopted thresholds. Because Alternative 3 would require less construction activity and generate fewer emissions than Alternative 1A, chronic non-cancer hazard and cancer risk from the development of Alternative 3 would also be less than the respective SJVAPCD significance thresholds. Accordingly, this alternative would not expose sensitive receptors to adverse levels of DPM such as would result in chronic non-cancer hazards or cancer risk.

***CEQA Conclusion*:** DPM generated during construction poses inhalation-related chronic non-cancer hazard and cancer risk if adjacent receptors are exposed to significant concentrations for prolonged durations. The DPM generated during Alternative 3 construction would not exceed the SJVAPCD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this impact for DPM emissions would be less than significant. No mitigation is required.

Impact AQ-18: Exposure of Sensitive Receptors to *Coccidioides immitis* (Valley Fever)

***NEPA Effects*:** As discussed under Alternative 1A, earthmoving activities during construction could release *C. immitis* spores if filaments are present and other soil chemistry and climatic conditions are conducive to spore development. Receptors adjacent to the construction area may therefore be exposed to increase risk of inhaling *C. immitis* spores and subsequent development of Valley Fever. Dust-control measures are the primary defense against infection (United States Geological Survey 2000). Implementation of advanced air-district recommended fugitive dust controls outlined in Appendix 3B, *Environmental Commitments*, would avoid dusty conditions and reduce the risk of contracting Valley Fever through routine watering and other controls. Therefore, this alternative's effect of exposure of sensitive receptors to increased Valley Fever risk during construction would not be adverse.

***CEQA Conclusion*:** Construction of the water conveyance facility would involve earthmoving activities that could release *C. immitis* spores if filaments are present and other soil chemistry and climatic conditions are conducive to spore development. Receptors adjacent to the construction area may therefore be exposed to increase risk of inhaling *C. immitis* spores and subsequent development of Valley Fever. Implementation of air-district recommended fugitive dust controls outlined in Appendix 3B, *Environmental Commitments*, would avoid dusty conditions and reduce the risk of contracting Valley Fever through routine watering and other controls. Therefore, this impact would be less than significant. No mitigation is required.

Impact AQ-19: Creation of Potential Odors Affecting a Substantial Number of People during Construction or Operation of the Proposed Water Conveyance Facility

NEPA Effects: As discussed under Alternative 1A, odors from construction activities would be localized and generally confined to the immediate area surrounding the construction site. Moreover, odors would be temporary and localized, and they would cease once construction activities have been completed. Thus, it is not anticipated that construction of CM1 would create objectionable odors from construction equipment or asphalt paving.

Construction of the water conveyance facility would require removal of subsurface material during tunnel excavation and sediment removal. As discussed under Alternative 1A, geotechnical tests indicate that VOC levels in Plan Area soils are below the method detection limits, indicating that organic decay of exposed RTM and sediment will be relatively low (URS 2014). Moreover, drying and stockpiling of the removed RTM and sediment will occur under aerobic conditions, which will further limit any potential decomposition and associated malodorous products. Accordingly, it is not anticipated that tunnel and sediment excavation would create objectionable odors.

Typical facilities known to produce odors include landfills, wastewater treatment plants, food processing facilities, and certain agricultural activities. Alternative 3 would not result in the addition of facilities associated with odors, and as such, long-term operation of the water conveyance facility would not result in objectionable odors.

CEQA Conclusion: Alternative 3 would not result in the addition of major odor producing facilities. Diesel emissions during construction could generate temporary odors, but these would quickly dissipate and cease once construction is completed. Likewise, potential odors generated during asphalt paving would be addressed through mandatory compliance with air district rules and regulations. While tunnel excavation would unearth substantial quantities of RTM, geotechnical tests indicate that soils in the Plan Area have relatively low organic constituents. Moreover, drying and stockpiling of the removed RTM will occur under aerobic conditions, which will further limit any potential decomposition and associated malodorous products. Accordingly, the impact of exposure of sensitive receptors to potential odors would be less than significant. No mitigation is required.

Impact AQ-20: Generation of Criteria Pollutants in the Excess of Federal *De Minimis* Thresholds from Construction and Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: EPA's General Conformity Rule (40 CFR Parts 51 and 93) only applies to Federal actions that are taken in EPA-designated "nonattainment" or "maintenance" areas. Accordingly, as outlined in Section III.A of the General Conformity Rule, "only actions which cause emissions in designated nonattainment and maintenance areas are subject to the regulations". Criteria pollutant emissions resulting from construction and operation of Alternative 1A in the SFNA, SJVAB, and SFBAAB are presented in Table 22-92. Exceedances of the federal *de minimis* thresholds are shown in underlined text.

Sacramento Federal Nonattainment Area

As shown in Table 22-92, implementation of Alternative 3 would exceed the following SFNA federal *de minimis* thresholds:

- ROG: 2024
- NO_X: 2018–2028

ROG and NO_X are precursors to ozone and NO_X is a precursor to PM, for which the SFNA is in nonattainment for the NAAQS. Since project emissions exceed the federal *de minimis* thresholds for ROG and NO_X, a general conformity determination must be made to demonstrate that total direct and indirect emissions of ROG and NO_X would conform to the appropriate SFNA SIP for each year of construction in which the *de minimis* thresholds are exceeded.

NO_X is also a precursor to PM and can contribute to PM formation. As discussed above, Sacramento County is currently designated maintenance for the PM10 NAAQS and portions of the SVAB are designated nonattainment for the PM2.5 NAAQS. NO_X emissions in excess of 100 tons per year in Sacramento County trigger a secondary PM10 precursor threshold, whereas NO_X emissions in excess of 100 tons per year in the SVAB trigger a secondary PM2.5 precursor threshold. Since NO_X emissions can contribute to PM formation, NO_X emissions in excess of these secondary precursor thresholds could conflict with the applicable PM10 and PM2.5 SIPs. Accordingly, NO_X offsets pursued for the purposes of general conformity for those years in which NO_X emissions exceed 100 tons must occur within the federally designated PM2.5 nonattainment and PM10 maintenance areas of the SVAB.

As shown in Table 22-90, NO_X emissions generated by construction activities in SMAQMD (Sacramento County) would exceed 100 tons per year between 2023 and 2027. The project therefore triggers the secondary PM10 precursor threshold, requiring all NO_X offsets for 2023 through 2027 to occur within Sacramento County.

Given the magnitude of NO_X emissions and the limited geographic scope available for offsets in 2023 through 2027 (Sacramento County), neither Mitigation Measures AQ-1a nor 1b could feasibly reduce NO_X emissions to net zero for the purposes of general conformity.[38] This impact would be adverse. In the event that Alternative 3 is selected as the APA, Reclamation, USFWS, and NMFS would need to demonstrate that conformity is met for NO_X and secondary PM10 formation through a local air quality modeling analysis (i.e., dispersion modeling) or other acceptable methods to ensure project emissions do not cause or contribute to any new violations of the NAAQS or increase the frequency or severity of any existing violations.

Mitigation Measure AQ-1a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-1a under Impact AQ-1 in the discussion of Alternative 1A.

Mitigation Measure AQ-1b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-1b under Impact AQ-1 in the discussion of Alternative 1A.

[38] The secondary PM precursor thresholds are triggered through the General Conformity Regulation (40 CFR 93.153 (a)(1)). Accordingly, confinement of the geographic scope for available offsets only applies to the General Conformity determination and does not influence mitigation feasibility for Impacts AQ-1 or AQ-28.

Table 22-92. Criteria Pollutant Emissions from Construction and Operation of Alternative 3 in Nonattainment and Maintenance Areas of the SFNA, SJVAB, and SFBAAB (tons/year)

	Sacramento Federal Nonattainment Area					
Year	ROG	NO_X[a]	CO[b]	PM10[c]	PM2.5	SO_2
2016	0	0	0	0	0	0
2017	0	0	0	0	0	0
2018	1	12	<1	6	1	<1
2019	3	16	<1	18	3	<1
2020	6	50	<1	26	4	<1
2021	8	73	2	38	6	<1
2022	11	95	4	45	8	<1
2023	19	152	4	60	10	1
2024	25	194	4	69	13	1
2025	22	162	2	48	10	1
2026	21	148	2	43	9	1
2027	17	128	2	47	9	1
2028	4	29	2	23	4	<1
2029	<1	3	<1	3	<1	<1
ELT	0.10	0.61	1.23	0.21	0.06	<0.01
LLT	0.09	0.51	1.17	0.20	0.05	<0.01
De Minimis	*25*	*25*	*100*	*100*	*100*	*100*
	San Joaquin Valley Air Basin					
Year	ROG	NO_X[a]	CO[b]	PM10	PM2.5	SO_2
2016	0	0	0	2	<1	0
2017	0	0	0	0	0	0
2018	1	5	0	10	1	<1
2019	9	64	0	15	2	<1
2020	15	110	0	29	5	0
2021	24	171	0	46	7	1
2022	22	146	0	28	5	<1
2023	20	119	0	15	3	<1
2024	19	109	0	14	3	<1
2025	12	72	0	12	2	<1
2026	5	29	0	3	1	<1
2027	<1	<1	0	<1	<1	<1
2028	0	0	0	0	0	0
2029	0	0	0	0	0	0
ELT	0.01	0.07	0.13	0.02	<0.01	<0.01
LLT	0.01	0.06	0.12	0.01	<0.01	<0.01
De Minimis	*10*	*10*	*100*	*100*	*100*	*100*

Year	San Francisco Bay Area Air Basin					
	ROG	NO_X[a]	CO[b]	PM10[d]	PM2.5	SO_2
2016	0	0	0	-	0	0
2017	0	0	0	-	0	0
2018	<1	1	<1	-	<1	<1
2019	2	14	<1	-	1	<1
2020	3	22	1	-	1	<1
2021	4	30	2	-	1	<1
2022	4	33	3	-	2	<1
2023	7	54	4	-	4	<1
2024	11	80	4	-	5	1
2025	7	48	3	-	3	<1
2026	5	37	2	-	3	<1
2027	3	20	2	-	3	<1
2028	<1	2	1	-	1	<1
2029	<1	<1	<1	-	<1	<1
ELT	0.01	0.08	0.14	-	0.01	<0.01
LLT	0.01	0.07	0.14	-	0.01	<0.01
De Minimis	*100*	*100*	*100*	-	*100*	*100*

[a] NO_X emissions in excess of 100 tons per year within federally designated PM10 and PM2.5 nonattainment or maintenance areas trigger a secondary PM10 and PM2.5 precursor threshold. NO_X emissions in excess of this secondary threshold could conflict with the applicable PM10 and PM2.5 SIPs. Accordingly, NO_X offsets pursued for the purposes of general conformity for those years in which NO_X emissions exceed 100 tons must occur within the federally designated PM2.5 nonattainment and PM10 maintenance areas, as applicable.

[b] The proposed water conveyance facility is located within a federally designated CO attainment area. Accordingly, CO emissions generated by construction of CM1 are not subject to the General Conformity Rule and are excluded from the emissions summary and general conformity analysis (40 CFR Part 51 and 93, Section III.A). Emissions presented in the table are limited those generated by haul trucks, which would occur in federally designated CO maintenance area.

[c] There are no federally designated PM10 maintenance areas in Yolo County. Accordingly, PM10 emissions generated by construction of CM1 in Yolo County are not subject to the General Conformity Rule and are excluded from the emissions summary and general conformity analysis for the SFNA (40 CFR Part 51 and 93, Section III.A). Emissions presented in the table are limited those generated within Sacramento County.

[d] There are no federally designated PM10 nonattainment or maintenance areas in the SFBAAB. Accordingly, PM10 emissions generated by construction of CM1 are not subject to the General Conformity Rule and are excluded from the emissions summary and general conformity analysis (40 CFR Part 51 and 93, Section III.A).

San Joaquin Valley Air Basin

As shown in Table 22-92, implementation of Alternative 3 would exceed the following SJVAB federal *de minimis* thresholds:

- ROG: 2020–2025
- NO_X: 2019–2026

ROG and NO_X are precursors to ozone and NO_X is a precursor to PM, for which the SJVAB is in nonattainment for the NAAQS. Since project emissions exceed the federal *de minimis* threshold for ROG and NO_X, a general conformity determination must be made to demonstrate that total direct and indirect emissions of ROG and NO_X would conform to the appropriate SJVAB SIP for each year of construction in which the *de minimis* thresholds are exceeded.

NO_X is also a precursor to PM and can contribute to PM formation. As discussed above, the SJVAB is currently designated maintenance for the PM10 NAAQS and nonattainment for the PM2.5 NAAQS. NO_X emissions in excess of 100 tons per year trigger a secondary PM precursor threshold, and could conflict with the applicable PM10 and PM2.5 SIPs. As shown in Table 22-92, NO_X emissions generated by construction activities in the SJVAB would exceed 100 tons per year between 2020 and 2024. NO_X offsets pursued for the purposes of general conformity for those years in which NO_X emissions exceed 100 tons must occur within the federally designated PM2.5 nonattainment and PM10 maintenance areas of the SJVAB, which are consistent with the larger nonattainment boundary for ozone.

As shown in Appendix 22E, *General Conformity Determination,* Attachment 22E-1, SJVAPCD confirms that sufficient emissions reduction credits would be available to fully offset ROG and NO_X emissions in excess of the federal *de minimis* thresholds zero through implementation of Mitigation Measures AQ-4a and 4b. Mitigation Measures AQ-4a and 4b will ensure the requirements of the mitigation and offset program are implemented and conformity requirements for ROG and NO_X are met, should Alternative 3 be selected as the APA.

Mitigation Measure AQ-4a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4a under Impact AQ-4 in the discussion of Alternative 1A.

Mitigation Measure AQ-4b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4b under Impact AQ-4 in the discussion of Alternative 1A.

San Francisco Bay Area Air Basin

As shown in Table 22-92, implementation of Alternative 3 would not exceed any of the SFBAAB federal *de minimis* thresholds. Accordingly, a general conformity determination is not required as total direct and indirect emissions would conform to the appropriate SFBAAB SIPs.

CEQA Conclusion: SFNA and SJVAB are classified as nonattainment areas with regard to the ozone NAAQS and the impact of increases in criteria pollutant emissions above the air basin *de minimis* thresholds could conflict with or obstruct implementation of the applicable air quality plans. Since construction emissions in the SFNA and SJVAB would exceed the *de minimis* thresholds for ROG and NO_X, this impact would be significant.

Mitigation Measures AQ-4a and AQ-4b would ensure project emissions would not result in an increase in regional ROG or NO_X in the SJVAB. These measures would therefore ensure total direct and indirect ROG and NO_X emissions generated by the project would conform to the appropriate SJVAB SIPs by offsetting the action's emissions in the same or nearby area to net zero. Accordingly, impacts would be less than significant with mitigation in the SJVAB.

Although Mitigation Measures AQ-1a and AQ-1b would reduce NO_X in the SFNA, given the magnitude of NO_X emissions and the limited geographic scope available for offsets (Sacramento County), neither measure could feasibly reduce NO_X emissions to net zero for the purposes of general conformity. This impact would be significant and unavoidable in the SFNA.

Emissions generated within the SFBAAB would not exceed the SFBAAB de minimis thresholds and would therefore conform to the appropriate SFBAAB SIPs. No mitigation is required.

Impact AQ-21: Generation of Cumulative Greenhouse Gas Emissions during Construction of the Proposed Water Conveyance Facility

NEPA Effects: GHG (CO_2, CH_4, N_2O, SF_6, and HFCs) emissions resulting from construction of Alternative 3 are presented in Table 22-93. Emissions with are presented with implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*) and state mandates to reduce GHG emissions. State mandates include the RPS, LCFS, and Pavley. These mandates do not require additional action on the part of DWR, but will contribute to GHG emissions reductions. For example, Pavley and LCFS will improve the fuel efficiency of vehicles and reduce the carbon content of transportation fuels, respectively. Equipment used to construct the project will therefore be cleaner and less GHG intensive than if the state mandates had not been established.

Table 22-94 summarizes CO_2e emissions that would be generated in the BAAQMD, SMAQMD, SJVAPCD, and YSAQMD. The table does not include emissions from electricity generation as these emissions would be generated by power plants located throughout the state and the specific location of electricity-generating facilities is unknown (see discussion preceding this impact analysis). Due to the global nature of GHGs, the determination of effects is based on total emissions generated by construction (Table 22-93). GHG emissions presented in Table 22-93 are therefore provided for information purposes only.

Construction of Alternative 3 would generate a total of 1.8 million metric tons of GHG emissions after implementation of environmental commitments and state mandates. This is equivalent to adding 376,000 typical passenger vehicles to the road during construction (U.S. Environmental Protection Agency 2014e). As discussed in section 22.3.2, *Determination of Effects*, any increase in emissions above net zero associated with construction of the BDCP water conveyance features would be adverse. Accordingly, this effect would be adverse. Mitigation Measure AQ-21, which would develop a GHG Mitigation Program to reduce construction-related GHG emissions to net zero, is available address this effect.

Table 22-93. GHG Emissions from Construction of Alternative 3 (metric tons/year)[a]

Year	Equipment and Vehicles (CO_2e)	Electricity (CO_2e)	Concrete Batching (CO_2)	Total CO_2e
2016	0	0	335	335
2017	0	0	0	0
2018	6,978	600	41,658	49,236
2019	34,241	3,355	6,543	44,139
2020	60,925	16,114	40,658	117,697
2021	92,210	42,900	80,642	215,752
2022	102,778	60,242	122,225	285,245
2023	120,495	53,627	119,332	293,455
2024	137,213	55,937	142,771	335,921
2025	95,792	37,735	95,335	228,861
2026	72,708	13,472	22,846	109,026
2027	49,077	2,573	32,947	84,597
2028	14,754	68	6,482	21,304
2029	1,300	2	0	1,302
Total	*788,471*	*286,625*	*711,774*	*1,786,869*

[a] Emissions estimates do not account for GHG flux from land disturbance. Surface and subsurface (e.g., tunneling) activities may oxidize peat soils, releasing GHG emissions. However, recent geotechnical surveys indicated that peat is negligible below 80 feet of depth. The tunnel will be placed below this range and the design adjusted if peat soils are discovered. Peat material encountered during surface excavation for non-tunnel work will be covered with top soil to reduce oxidation when needed.

Values may not total correctly due to rounding.

CEQA Conclusion: Construction of Alternative 3 would generate a total of 1.8 million metric tons of GHG emissions. This is equivalent to adding 376,000 typical passenger vehicles to the road during construction (U.S. Environmental Protection Agency 2014e). As discussed in section 22.3.2, *Determination of Effects*, any increase in emissions above net zero associated with construction of the BDCP water conveyance features would be significant. Mitigation Measure AQ-21 would develop a GHG Mitigation Program to reduce construction-related GHG emissions to net zero. Accordingly, this impact would be less-than-significant with implementation of Mitigation Measure AQ-21.

Table 22-94. Total CO_2e Emissions from Construction of Alternative 3 by Air District (metric tons/year)[a]

Air District	Equipment and Vehicles (CO_2e)	Concrete Batching (CO_2)[a]	Total CO_2e[b]
SMAQMD	315,945	427,064	743,009
YSAQMD	28,488	0	28,488
SJVAPCD	281,182	142,355	423,536
BAAQMD	162,856	142,355	305,211

[a] Emissions assigned to each air district based on the number of batching plants located in that air district.
[b] Values may not total correctly due to rounding.

Mitigation Measure AQ-21: Develop and Implement a GHG Mitigation Program to Reduce Construction Related GHG Emissions to Net Zero (0)

Please see Mitigation Measure AQ-21 under Impact AQ-21 in the discussion of Alternative 1A.

Impact AQ-22: Generation of Cumulative Greenhouse Gas Emissions from Operation and Maintenance of the Proposed Water Conveyance Facility and Increased Pumping

NEPA Effects: Operation of Alternative 3 would generate direct and indirect GHG emissions. Sources of direct emissions include heavy-duty equipment, on road crew trucks, and employee vehicle traffic. Indirect emissions would be generated predominantly by electricity consumption required for pumping as well as, maintenance, lighting, and other activities.

Table 22-95 summarizes long-term operational GHG emissions associated with operations, maintenance, and increased SWP pumping. Emissions were quantified for both ELT and LLT conditions, although activities would take place annually until project decommissioning. Emissions include state mandates to reduce GHG emissions (described in Impact AQ-21) are presented (there are no BDCP specific operational environmental commitments). Total CO_2e emissions are compared to both the No Action Alternative (NEPA point of comparison) and Existing Conditions (CEQA baseline). As discussed in Section 22.3.1.2, equipment emissions are assumed to be zero under both the No Action Alternative (NEPA point of comparison) and Existing Conditions (CEQA baseline). The equipment emissions presented in Table 22-95 are therefore representative of project impacts for both the NEPA and CEQA analysis.

Table 22-95. GHG Emissions from Operation, Maintenance, and Increased SWP Pumping, Alternative 3 (metric tons/year)

		Electricity CO_{2e}		Total CO_2e	
Condition	Equipment CO_2e	NEPA Point of Comparison	CEQA Baseline	NEPA Point of Comparison	CEQA Baseline
ELT	302	-	184,015	-	184,316
LLT	298	43,634	13,616	43,932	13,914

Note: The *NEPA point of comparison* compares total CO_2e emissions after implementation of Alternative 3 to the No Action Alternative, whereas the *CEQA baseline* compares total CO_2e emissions to Existing Conditions.

Table 22-96 summarizes equipment CO_2e emissions that would be generated in the BAAQMD, SMAQMD, and SJVAPCD (no operational emissions would be generated in the YSAQMD). The table does not include emissions from SWP pumping as these emissions would be generated by power plants located throughout the state (see discussion preceding this impact analysis). GHG emissions presented in Table 22-96 are therefore provided for information purposes only.

Table 22-96. Equipment CO_2e Emissions from Operation and Maintenance of Alternative 3 by Air District (metric tons/year)

Air District	ELT	LLT
SMAQMD	247	242
SJVAPCD	25	26
BAAQMD	30	31
Total	302	298

[a] Emissions do not include emissions generated by increased SWP pumping.

SWP Operational and Maintenance GHG Emissions Analysis

Alternative 3 would add approximately 1,514 GWh[39] of additional net electricity demand to operation of the SWP each year assuming 2060 conditions. Conditions at 2060 (LLT) are used for this analysis because they yield the largest potential additional net electricity requirements and therefore represent the largest potential impact. This 1,514 GWh is based on assumptions of future conditions and operations and includes all additional energy required to operate the project with BDCP Alternative 3 including any additional energy associated with additional water being moved through the system.

In the CAP, DWR developed estimates of historical, current, and future GHG emissions. Figure 22-15 shows those emissions as they were projected in the CAP and how those emissions projections would change with the additional electricity demands needed to operate the SWP with the addition of BDCP Alternative 3. As shown in Figure 22-15, in 2024, the year BDCP Alternative 3 is projected to go online, DWR total emissions jump from around 912,000 metric tons of CO_2e to around 1.6 million metric tons of CO_2e. This elevated level is approximately 300,000 metric tons of CO_2e above DWR's designated GHG emissions reduction trajectory (red line, which is the linear interpolation between DWR's 2020 GHG emissions goal and DWR's 2050 GHG emissions goal.) The projection indicates that after the initial jump in emissions, existing GHG emissions reduction measures would bring the elevated GHG emissions level back down below DWR's GHG emissions reduction trajectory by 2042 and that DWR would still achieve its GHG emission reduction goal by 2050.

Because employing only DWR's existing GHG emissions reduction measures would result in a large initial increase in emissions and result in DWR emissions exceeding the emissions reduction trajectory for several years, DWR will take additional actions to reduce GHG emissions if BDCP Alternative 3 is implemented.

The CAP sets forth DWR's plan to manage its activities and operations to achieve its GHG emissions reduction goals. The CAP commits DWR to monitoring its emissions each year and evaluating its emissions every five years to determine whether it is on a trajectory to achieve its GHG emissions reduction goals. If it appears that DWR will not meet the GHG emission reduction goals established in the plan, DWR may make adjustments to existing emissions reduction measures, devise new measures to ensure achievement of the goals, or take other action. Given the scale of additional

[39] Estimated net energy demand differs slightly from what is presented in Chapter 21, *Energy*. This is because the above analysis includes energy needed for transmission and distribution of water along the Valley String, which is required to enable a comparison with the assumptions in DWR's CAP.

emissions that BDCP Alternative 3 would add to DWR's total GHG emissions, DWR has evaluated the most likely method that it would use to compensate for such an increase in GHG emissions: modification of DWR's REPP. The DWR REPP (GHG emissions reduction measure OP-1 in the CAP) describes the amount of additional renewable energy that DWR expects to purchase each year to meet its GHG emissions reduction goals. The REPP lays out a long-term strategy for renewable energy purchases, though actual purchases of renewable energy may not exactly follow the schedule in the REPP and will ultimately be governed by actual operations, measured emissions, and contracting.

Table 22-97 below shows how the REPP could be modified to accommodate BDCP Alternative 3, and shows that additional renewable energy resources could be purchased during years 2022–2025 over what was programmed in the original REPP. The net result of this change is that by 2026 DWR's energy portfolio would contain nearly 1,514 GWh of renewable energy (in addition to hydropower generated at SWP facilities). This amount is considerably larger than the amount called for in the original DWR REPP (1,492 compared to 792). In later years, 2031–2050, DWR would bring on slightly fewer additional renewable resources than programmed in the original REPP. Figure 22-16 shows how this modified Renewable Energy Procurement Plan would affect DWR's projected future emissions with BDCP Alternative 3.

Table 22-97. Changes in Expected Renewable Energy Purchases 2011–2050 (Alternative 3)

	Additional GWh of Renewable Power Purchased (Above previous year)	
Year(s)	Original CAP	New CAP
2011–2020	36	36
2021	72	72
2022–2025	72	247
2026–2030	72	72
2031–2040	108	63
2041–2050	144	74
Total Cumulative	52,236	61,111

As shown in the analysis above and consistent with the analysis contained in the CAP and associated Initial Study and Negative Declaration for the CAP, BDCP Alternative 3 would not adversely affect DWR's ability to achieve the GHG emissions reduction goals set forth in the CAP. Further, Alternative 3 would not conflict with any of DWR's specific action GHG emissions reduction measures and implements all applicable project level GHG emissions reduction measures as set forth in the CAP. BDCP Alternative 3 is therefore consistent with the analysis performed in the CAP. There would be no adverse effect.

CEQA Conclusion**:** SWP GHG emissions currently are below 1990 levels and achievement of the goals of the CAP means that total DWR GHG emissions will be reduced to 50% of 1990 levels by 2020 and to 80% of 1990 levels by 2050. The implementation of BDCP Alternative 3 would not affect DWR's established emissions reduction goals or baseline (1990) emissions and therefore would not result in a change in total DWR emissions that would be considered significant. Prior adoption of the CAP by DWR already provides a commitment on the part of DWR to make all necessary modifications to DWR's REPP (as described above) or any other GHG emission reduction measure in the CAP that are necessary to achieve DWR's GHG emissions reduction goals. Therefore no amendment to the approved CAP is necessary to ensure the occurrence of the additional GHG emissions reduction activities needed to account for BDCP-related operational emissions. The effect of BDCP Alternative 3 with respect to GHG emissions is less than cumulatively considerable and therefore less than significant. No mitigation is required.

Impact AQ-23: Generation of Cumulative Greenhouse Gas Emissions from Increased CVP Pumping as a Result of Implementation of CM1

NEPA Effects: As previously discussed, DWR's CAP cannot be used to evaluate environmental impacts associated with increased CVP pumping, as emissions associated with CVP are not under DWR's control and are not included in the CAP. Accordingly, GHG emissions resulting from increased CVP energy use are evaluated separately from GHG emissions generated as a result of SWP energy use.

Under Alternative 3, operation of the CVP yields the generation of clean, GHG emissions-free, hydroelectric energy. This electricity is sold into the California electricity market or directly to energy users. Analysis of the No Action Alternative indicates that the CVP generates and will continue to generate all of the electricity needed to operate the CVP system and approximately 3,500 GWh of excess hydroelectric energy that would be sold to energy users throughout California. Implementation of Alternative 3, however, would result in an increase of 153 GWh in the demand for CVP generated electricity, which would result in a reduction of 153 GWh or electricity available for sale from the CVP to electricity users. This reduction in the supply of GHG emissions-free electricity to the California electricity users could result in a potential indirect effect of the project, as these electricity users would have to acquire substitute electricity supplies that may result in GHG emissions (although additional conservation is also a possible outcome as well).

It is unknown what type of power source (e.g., renewable, natural gas) would be substituted for CVP electricity or if some of the lost power would be made up with higher efficiency. Given State mandates for renewable energy and incentives for energy efficiency, it is possible that a considerable amount of this power would be replaced by renewable resources or would cease to be needed as a result of higher efficiency. However, to ensure a conservative analysis, indirect emissions were quantified for the entire quantity of electricity (153 GWh) using the current and future statewide energy mix (adjusted to reflect RPS) (please refer to Appendix 22A, *Air Quality Analysis Methodology,* for additional detail on quantification methods).

Substitution of 153 GWh of electricity with a mix of sources similar to the current statewide mix would result in emissions of 42,816 metric tons of CO_2e; however, under expected future conditions (after full implementation of the RPS), emissions would be 33,271 metric tons of CO_2e.

Use of CVP hydroelectricity to meet increased electricity demand from operation of CVP facilities associated with Alternative 3 would reduce available CVP hydroelectricity to other California electricity users. Substitution of the lost electricity with electricity from other sources could indirectly result in an increase of GHG emissions that is comparable or larger than the level of GHG emissions that trigger mandatory GHG reporting for major facilities. As a result, these emissions could contribute to a cumulatively considerable effect and are therefore adverse. However, these emissions would be caused by dozens of independent electricity users, who had previously bought CVP power, making decisions about different ways to substitute for the lost power. These decisions are beyond the control of Reclamation or any of the other BDCP Lead Agencies. Further, monitoring to determine the actual indirect change in emissions as a result of BDCP actions would not be feasible. In light of the impossibility of predicting where any additional emissions would occur, as well as Reclamation's lack of regulatory authority over the purchasers of power in the open market, no workable mitigation is available or feasible.

CEQA Conclusion**:** Operation of the CVP is a federal activity beyond the control of any State agency such as DWR, and the power purchases by private entities or public utilities in the private marketplace necessitated by a reduction in available CVP-generated hydroelectric power are beyond the control of the State, just as they are beyond the control of Reclamation. For these reasons, there are no feasible mitigation measures that could reduce this potentially significant indirect impact, which is solely attributable to operations of the CVP and not the SWP, to a less than significant level. This impact is therefore determined to be significant and unavoidable**.**

Impact AQ-24: Generation of Regional Criteria Pollutants from Implementation of CM2–CM11

NEPA Effects: Table 22-29 summarizes potential construction and operational emissions that may be generated by implementation of CM2–CM11. See the discussion of Impact AQ-24 under Alternative 1A.

Criteria pollutants from restoration and enhancement actions could exceed applicable general conformity *de minimis* levels and applicable local thresholds. The effect would vary according to the equipment used in construction of a specific conservation measure, the location, the timing of the actions called for in the conservation measure, and the air quality conditions at the time of implementation; these effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. The effect of increases in emissions during implementation of CM2–CM11 in excess of applicable general conformity *de minimis* levels and air district regional thresholds (Table 22-8) could violate air basin SIPs and worsen existing air quality conditions. Mitigation Measure AQ-24 would be available to reduce this effect, but emissions would still be adverse.

CEQA Conclusion**:** Construction and operational emissions associated with the restoration and enhancement actions would result in a significant impact if the incremental difference, or increase, relative to Existing Conditions exceeds the applicable local air district thresholds shown in Table 22-8; these effects are expected to be further evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measure AQ-24 would be available to reduce this effect, but may not be sufficient to reduce emissions below applicable air quality management district thresholds (see Table 22-8). Consequently, this impact would be significant and unavoidable.

Mitigation Measure AQ-24: Develop an Air Quality Mitigation Plan (AQMP) to Ensure Air District Regulations and Recommended Mitigation are Incorporated into Future Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-24 under Impact AQ-24 in the discussion of Alternative 1A.

Impact AQ-25: Exposure of Sensitive Receptors to Health Hazards from Localized Particulate Matter, Carbon Monoxide, and Diesel Particulate Matter from Implementation of CM2–CM11

NEPA Effects: The potential for Alternative 3 to expose sensitive receptors increased health hazards from localized PM, CO, and DPM would be similar to Alternative 1A. Activities shown in Table 22-29 with the greatest potential to have short or long-term air quality impacts are also anticipated to have the greatest potential to expose receptors to substantial pollutant concentrations. The effect would vary according to the equipment used, the location and timing of the actions called for in the conservation measure, the meteorological and air quality conditions at the time of implementation, and the location of receptors relative to the emission source. Potential health effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions.

The effect of increases in PM, CO, or DPM (cancer and non-cancer-risk) in excess of applicable air district thresholds (Table 22-8) at receptor locations could result in adverse health impacts. Mitigation Measures AQ-24 and AQ-25 would be available to reduce this effect.

***CEQA Conclusion*:** Construction and operational emissions associated with the restoration and enhancement actions under Alternative 3 would result in a significant impact if PM, CO, or DPM (cancer and non-cancer-risk) concentrations at receptor locations exceed the applicable local air district thresholds shown in Table 22-8; these effects are expected to be further evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measures AQ-24 and AQ-25 would ensure localized concentrations at receptor locations would be below applicable air quality management district thresholds (see Table 22-8). Consequently, this impact would be less than significant.

Mitigation Measure AQ-24: Develop an Air Quality Mitigation Plan (AQMP) to Ensure Air District Regulations and Recommended Mitigation are Incorporated into Future Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-24 under Impact AQ-24 in the discussion of Alternative 1A.

Mitigation Measure AQ-25: Prepare a Project-Level Health Risk Assessment to Reduce Potential Health Risks from Exposure to Localized DPM and PM Concentrations

Please see Mitigation Measure AQ-25 under Impact AQ-25 in the discussion of Alternative 1A.

Impact AQ-26: Creation of Potential Odors Affecting a Substantial Number of People from Implementation of CM2–CM11

NEPA Effects: The potential for Alternative 3 to expose sensitive receptors increased odors would be similar to Alternative 1A. Accordingly, construction activities associated with CM2-CM11 are not anticipated to result in nuisance odors. Similarly, while restored land uses associated with the program have the potential to generate odors from natural processes, the emissions would be similar in origin and magnitude to the existing land use types in the restored area (e.g., managed wetlands). Moreover, specific odor effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Accordingly, odor-related effects associated with CM2–CM11 would not be adverse.

***CEQA Conclusion*:** Alternative 3 would not result in the addition of major odor producing facilities. Diesel emissions during construction could generate temporary odors, but these would quickly dissipate and cease once construction is completed. Increases in wetland, tidal, and upland habitats may increase the potential for odors from natural processes. However, the origin and magnitude of odors would be similar to the existing land use types in the restored area (e.g., managed wetlands). Moreover, specific odor impacts would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions.

Accordingly, the impact of exposure of sensitive receptors to potential odors would be less than significant. No mitigation is required.

Impact AQ-27: Generation of Cumulative Greenhouse Gas Emissions from Implementation of CM2–CM11

NEPA Effects: CM2–CM11 implemented under Alternative 3 would result in local GHG emissions from construction equipment and vehicle exhaust, similar to Alternative 1A. Restoration activities with the greatest potential for emissions include those that break ground and require use of earthmoving equipment. The type of restoration action and related construction equipment use are shown in Table 22-29. Implementing CM2–CM11 would also affect long-term sequestration rates through land use changes, such as conversion of agricultural land to wetlands, inundation of peat soils, drainage of peat soils, and removal or planting of carbon-sequestering plants.

Without additional information on site-specific characteristics associated with each of the restoration components, a complete assessment of GHG flux from CM2–CM11 is currently not possible. The effect of carbon sequestration and CH_4 generation would vary by land use type, season, and chemical and biological characteristics; these effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measures AQ-24 and AQ-27 would be available to reduce this effect. However, due to the potential for increases in GHG emissions from construction and land use change, this effect would be adverse.

***CEQA Conclusion*:** The restoration and enhancement actions under Alternative 3 could result in a significant impact if activities are inconsistent with applicable GHG reduction plans, do not contribute to a lower carbon future, or generate excessive emissions, relative to other projects throughout the state. These effects are expected to be further evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measures AQ-24 and AQ-27 would be available to reduce this impact, but may not be sufficient to reduce to a less-than-significant level. Consequently, this impact would be significant and unavoidable.

Mitigation Measure AQ-24: Develop an Air Quality Mitigation Plan (AQMP) to Ensure Air District Regulations and Recommended Mitigation are Incorporated into Future Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-24 under Impact AQ-24 in the discussion of Alternative 1A.

Mitigation Measure AQ-27: Prepare a Land Use Sequestration Analysis to Quantify and Mitigate (as Needed) GHG Flux Associated with Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-27 under Impact AQ-27 in the discussion of Alternative 1A.

22.3.3.9 Alternative 4—Dual Conveyance with Modified Pipeline/Tunnel and Intakes 2, 3, and 5 (9,000 cfs; Operational Scenario H)

A total of three intakes would be constructed under Alternative 4. For the purposes of this analysis, it was assumed that Intakes 2, 3, and 5 (on the east bank of the Sacramento River) would be constructed under Alternative 4. Under this alternative, an intermediate forebay would also be constructed, and the conveyance facility would be a buried pipeline and tunnels (Figures 3-9 and 3-10 in Chapter 3, *Description of Alternatives*).

Construction and operation of Alternative 4 would require the use of electricity, which would be supplied by the California electrical grid. Power plants located throughout the state supply the grid with power, which will be distributed to the Study area to meet project demand. Power supplied by statewide power plants will generate criteria pollutants. Because these power plants are located throughout the state, criteria pollutant emissions associated with Alternative 4 electricity demand cannot be ascribed to a specific air basin or air district within the Study area. Criteria pollutant emissions from electricity consumption, which are summarized in Table 22-98 for Alternative 4 Scenarios H1 through H4, are therefore provided for informational purposes only and are not included in the impact conclusion.

Construction activities would generate emissions of ozone precursors (ROG and NO_X), CO, PM10, PM2.5, and SO_2. Table 22-99 summarizes criteria pollutant emissions that would be generated in the BAAQMD, SMAQMD, SJVAPCD, and YSAQMD in pounds per day and tons per year. Emissions estimates include implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*). Although emissions are presented in different units (pounds and tons), the amounts of emissions are identical (i.e., 2,000 pounds is identical to 1 ton). Summarizing emissions in both pounds per day and tons per year is necessary to evaluate project-level effects against the appropriate air district thresholds, which are given in both pounds and tons (see Table 22-8).

Table 22-98. Criteria Pollutant Emissions from Electricity Consumption: Construction and Net Project Operations, Alternative 4 (tons/year) [a,b]

Year	Analysis	ROG	CO	NO_X	PM10	PM2.5[c]	SO_2
2016	-	0	0	0	0	0	0
2017	-	0	0	0	0	0	0
2018	-	<1	1	<1	<1	<1	<1
2019	-	<1	3	<1	<1	<1	1
2020	-	<1	19	1	2	2	8
2021	-	<1	50	4	4	4	21
2022	-	1	70	5	6	6	30
2023	-	<1	62	5	5	5	26
2024	-	<1	65	5	5	5	27
2025	-	<1	44	3	4	4	19
2026	-	<1	16	1	1	1	7
2027	-	<1	4	<1	<1	<1	2
2028	-	<1	1	<1	<1	<1	<1
2029	-	<1	<1	<1	<1	<1	<1
Scenario H1							
ELT	CEQA	1	10	133	11	11	56
LLT	NEPA	2	16	217	18	18	92
LLT	CEQA	<1	4	52	4	4	22
Scenario H2							
ELT	CEQA	<0	-1	-9	-1	-1	-4
LLT	NEPA	1	6	85	7	7	36
LLT	CEQA	-1	-6	-80	-7	-7	-34
Scenario H3							
ELT	CEQA	<1	4	55	5	5	23
LLT	NEPA	1	10	143	12	12	61
LLT	CEQA	<0	-2	-22	-2	-2	-9
Scenario H4							
ELT	CEQA	-1	-6	-80	-7	-7	-34
LLT	NEPA	<1	1	16	1	1	7
LLT	CEQA	-1	-11	-150	-13	-13	-63

NEPA = Compares criteria pollutant emissions after implementation of Alternative 4 to the No Action Alternative.

CEQA = Compares criteria pollutant emissions after implementation of Alternative 4 to Existing Conditions.

[a] Emissions assume implementation of RPS (see Appendix 22A, *Air Quality Analysis Methodology*). Power plants that generate electricity for the proposed project would be subject to local air district permitting requirements, including standards to implement BACT to reduce criteria pollutant emissions.

[b] Because GHG emissions are cumulative (see Section 22.3.2.1) and not evaluated at the local air basin or air district level, they are discussed in Impacts AQ-21 and AQ-22. The GHG analysis for SWP power utilizes actual and forecasted GHG emissions rates for the SWP system, which differs slightly from the above analysis. Statewide grid average emission factors were utilized for the above analysis as criteria pollutant emission factors for SWP were unavailable. Please also note that the above analysis does not account for additional renewable energy that will be procured through modifications to DWR's REPP (see Impact AQ-22). Accordingly, the emissions results presented above represent a conservative assessment of potential criteria pollutant emissions.

[c] Emission factors for PM2.5 are currently unavailable. Consequently, PM2.5 emissions were assumed to equal PM10 emissions. Because PM2.5 represents a fraction of PM10, this approach represents a conservative assessment of PM2.5 emissions from electricity consumption.

As shown in Appendix 22B, *Air Quality Assumptions*, construction activities during several phases will likely occur concurrently. To ensure a conservative analysis, the maximum daily emissions during these periods of overlap were estimated assuming all equipment would operate at the same time—this gives the maximum total project-related air quality impact during construction. Accordingly, the daily emissions estimates represent a conservative assessment of construction impacts. Exceedances of the air district thresholds are shown in <u>underlined</u> text.

Table 22-99. Criteria Pollutant Emissions from Construction of Alternative 4 (pounds/day and tons/year)

	Maximum Daily Emissions (pounds/day)										Annual Emissions (tons/year)									
	Bay Area Air Quality Management District										Bay Area Air Quality Management District									
Year	ROG	NO_X	CO	PM10			PM2.5			SO_2	ROG	NO_X	CO	PM10			PM2.5			SO_2
				Exhaust	Dust	Total	Exhaust	Dust	Total					Exhaust	Dust	Total	Exhaust	Dust	Total	
2016	1	15	16	<1	3	3	<1	<1	1	<1	<1	1	2	<1	<1	<1	<1	<1	<1	<1
2017	3	49	25	<1	27	28	<1	7	7	1	<1	1	2	<1	<1	<1	<1	<1	<1	<1
2018	50	498	381	7	257	234	7	52	53	8	3	20	20	0	11	12	<1	2	2	<1
2019	41	487	268	4	309	283	4	63	61	4	2	19	16	0	16	16	<1	2	2	<1
2020	56	619	420	9	438	326	9	84	74	54	5	46	40	1	25	26	1	4	5	7
2021	82	898	605	17	474	369	16	92	90	127	8	72	58	2	34	35	2	6	7	12
2022	84	907	609	17	483	379	16	95	92	127	10	98	74	2	40	43	2	7	9	19
2023	86	934	631	17	500	395	16	103	100	128	10	99	75	2	39	42	2	7	9	19
2024	196	1,680	1,243	25	682	586	24	131	137	140	15	129	104	3	50	52	3	8	11	20
2025	203	1,700	1,260	26	676	580	25	129	136	147	19	148	125	2	51	53	2	8	11	13
2026	144	1,154	855	10	600	489	10	113	104	10	10	67	61	1	34	34	1	5	6	1
2027	108	871	673	16	501	487	16	98	109	10	9	58	54	1	31	32	1	5	6	1
2028	110	842	675	9	419	399	8	79	83	9	6	40	39	1	26	26	<1	4	4	1
2029	16	177	108	1	225	197	1	42	39	2	<1	1	1	<1	5	5	<1	1	1	<1
Thresholds	*54*	*54*	-	*82*	*BMPs*	-	*54*	*BMPs*	-	-	-	-	-	-	-	-	-	-	-	-
	Sacramento Metropolitan Air Quality Management District										Sacramento Metropolitan Air Quality Management District									
Year	ROG	NO_X	CO	PM10			PM2.5			SO_2	ROG	NO_X	CO	PM10			PM2.5			SO_2
				Exhaust	Dust	Total	Exhaust	Dust	Total					Exhaust	Dust	Total	Exhaust	Dust	Total	
2016	3	31	33	1	6	6	1	1	1	1	<1	3	4	<1	<1	<1	<1	<1	<1	<1
2017	7	73	62	9	19	29	9	3	13	1	<1	4	5	<1	<1	1	<1	<1	1	<1
2018	18	209	132	18	149	163	18	25	38	2	1	6	9	2	7	9	2	1	3	<1
2019	75	730	508	20	258	278	20	41	61	3	5	41	35	2	19	21	2	3	4	<1
2020	81	839	648	10	399	409	10	57	67	3	6	62	46	1	29	30	1	4	4	<1
2021	107	1,036	876	12	429	440	12	66	75	6	10	81	85	1	39	40	1	5	6	<1
2022	120	1,183	969	12	458	469	12	70	81	10	11	81	88	1	39	40	1	6	7	1
2023	113	934	887	10	422	429	10	67	74	7	10	72	80	1	37	38	1	6	6	<1
2024	153	1,247	991	15	445	460	14	76	91	12	11	80	80	1	35	36	1	5	7	1
2025	164	1,273	1,059	16	449	465	15	77	92	12	13	96	91	1	39	41	1	6	7	1
2026	147	1,236	981	15	446	461	14	72	86	12	12	87	86	1	33	34	1	5	6	1
2027	151	1,254	929	15	437	452	14	70	84	9	11	79	67	1	32	33	1	4	5	<1
2028	60	434	354	4	238	240	4	40	42	2	3	19	24	<1	19	19	<1	3	3	<1
2029	60	416	356	4	196	200	4	31	35	8	3	19	18	<1	13	13	<1	2	2	<1
Thresholds	-	*85*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

	San Joaquin Valley Air Pollution Control District										San Joaquin Valley Air Pollution Control District									
				PM10			PM2.5							PM10			PM2.5			
Year	ROG	NO_X	CO	Exhaust	Dust	Total	Exhaust	Dust	Total	SO_2	ROG	NO_X	CO	Exhaust	Dust	Total	Exhaust	Dust	Total	SO_2
2016	4	44	48	1	8	9	1	1	2	1	<1	4	5	<1	<1	<1	<1	<1	<1	<1
2017	7	58	67	8	13	21	8	2	10	1	1	5	6	<1	<1	1	<1	<1	1	<1
2018	44	342	358	20	113	128	20	14	32	6	3	20	22	2	8	9	2	1	3	<1
2019	87	601	603	16	304	312	16	38	49	3	6	42	38	2	26	27	2	3	5	<1
2020	146	1,125	1,027	18	585	603	17	70	87	16	12	95	95	1	46	48	1	6	7	2
2021	156	1,143	1,158	17	583	599	17	71	87	37	14	104	120	2	46	47	2	6	7	3
2022	142	1,077	1,258	17	493	509	16	62	78	37	16	112	145	2	45	47	2	6	8	6
2023	117	803	1,080	13	349	361	12	45	57	36	14	92	130	2	33	35	1	5	6	6
2024	100	635	956	9	251	260	9	34	43	36	12	74	117	1	23	24	1	3	5	6
2025	96	604	906	9	202	212	9	28	37	36	10	62	99	1	18	19	1	3	4	4
2026	55	360	521	4	193	197	4	25	29	1	6	39	55	<1	14	15	<1	2	2	<1
2027	52	338	477	5	171	176	5	21	26	1	4	27	33	<1	14	14	<1	2	2	<1
2028	38	254	263	3	90	92	3	12	14	1	2	10	12	<1	7	7	<1	1	1	<1
2029	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Thresholds	-	-	-	-	-	-	-	-	-	-	*10*	*10*	-	-	-	*15*	-	-	*15*	-

	Yolo Solano Air Quality Management District										Yolo Solano Air Quality Management District									
				PM10			PM2.5							PM10			PM2.5			
Year	ROG	NO_X	CO	Exhaust	Dust	Total	Exhaust	Dust	Total	SO_2	ROG	NO_X	CO	Exhaust	Dust	Total	Exhaust	Dust	Total	SO_2
2016	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2017	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2018	3	78	16	<1	21	22	<1	6	6	<1	<1	2	<1	<1	1	1	<1	<1	<1	<1
2019	4	105	22	<1	29	29	<1	7	8	1	<1	4	1	<1	1	1	<1	<1	<1	<1
2020	6	158	34	<1	43	43	<1	11	12	1	<1	2	<1	<1	1	1	<1	<1	<1	<1
2021	6	155	34	<1	43	43	<1	11	12	1	<1	6	1	<1	2	2	<1	<1	<1	<1
2022	7	174	39	1	50	51	1	13	13	1	<1	1	<1	<1	<1	<1	<1	<1	<1	<1
2023	6	139	37	<1	50	51	<1	13	13	1	<1	1	<1	<1	<1	<1	<1	<1	<1	<1
2024	6	136	37	<1	50	51	<1	13	13	1	<1	3	1	<1	1	1	<1	<1	<1	<1
2025	5	114	32	<1	43	43	<1	11	11	1	<1	10	3	<1	4	4	<1	1	1	<1
2026	5	111	32	<1	43	43	<1	11	11	1	<1	3	1	<1	1	1	<1	<1	<1	<1
2027	5	108	31	<1	43	43	<1	11	11	1	<1	1	<1	<1	<1	<1	<1	<1	<1	<1
2028	3	53	16	<1	21	22	<1	6	6	<1	<1	1	<1	<1	<1	<1	<1	<1	<1	<1
2029	3	51	16	<1	21	22	<1	6	6	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Thresholds	-	-	-	-	-	*80*	-	-	-	-	*10*	*10*	-	-	-	-	-	-	-	-

Operation and maintenance activities under Alternative 4 would result in emissions of ROG, NO_X, CO, PM10, PM2.5, and SO_2. Emissions were quantified for both ELT and LLT conditions, although activities would take place annually until project decommissioning. Future emissions, in general, are anticipated to lessen because of continuing improvements in vehicle and equipment engine technology.

Table 22-100 summarizes criteria pollutant emissions associated with operation of Alternative 4 in the BAAQMD, SMAQMD, and SJVAPCD in pounds per day and tons per year (no operational emissions would be generated in the YSAMQD). The emissions summarized in Table 22-100 are representative of Scenarios H1 through H4. Although emissions are presented in different units (pounds and tons), the amounts of emissions are identical (i.e., 2,000 pounds is identical to 1 ton). Summarizing emissions in both pounds per day and tons per year is necessary to evaluate project-level effects against the appropriate air district thresholds, which are given in both pounds and tons (see Table 22-8).

Table 22-100. Criteria Pollutant Emissions from Operation of Alternative 4 (Scenarios H1 through H4) (pounds per day and tons per year)

	Maximum Daily Emissions (pounds/day)						Annual Emissions (tons/year)					
	Bay Area Air Quality Management District						Bay Area Air Quality Management District					
Condition	ROG	NO_X	CO	PM10	PM2.5	SO_2	ROG	NO_X	CO	PM10	PM2.5	SO_2
ELT	4	27	50	9	3	<1	0.19	1.15	2.42	0.38	0.11	0.01
LLT	4	23	48	8	2	<1	0.16	0.97	2.33	0.37	0.10	0.01
Thresholds	*54*	*54*	-	*82*	*82*	-	-	-	-	-	-	
	Sacramento Metropolitan Air Quality Management District						Sacramento Metropolitan Air Quality Management District					
Condition	ROG	NO_X	CO	PM10	PM2.5	SO_2	ROG	NO_X	CO	PM10	PM2.5	SO_2
ELT	4	24	43	7	2	<1	0.13	0.80	1.65	0.27	0.08	<0.01
LLT	3	20	41	7	2	<1	0.11	0.68	1.58	0.26	0.07	<0.01
Thresholds	*65*	*65*	-	-	-	-	-	-	-	-	-	-
	San Joaquin Valley Air Pollution Control District						San Joaquin Valley Air Pollution Control District					
Condition	ROG	NO_X	CO	PM10	PM2.5	SO_2	ROG	NO_X	CO	PM10	PM2.5	SO_2
ELT	3	19	36	6	2	<1	0.01	0.08	0.14	0.02	0.01	<0.01
LLT	3	16	33	6	1	<1	0.01	0.07	0.13	0.02	0.01	<0.01
Thresholds	-	-	-	-	-	-	*10*	*10*	-	*15*	*15*	-

Impact AQ-1: Generation of Criteria Pollutants in Excess of the SMAQMD Regional Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: As shown in Table 22-99, construction emissions associated with Alternative 4 would exceed SMAQMD's daily NO_X threshold for all years between 2018 and 2029, even with implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*). Since NO_X is a precursor to ozone and PM, exceedances of SMAQMD's daily NO_X threshold could impact both regional ozone and PM formation, which could worsen regional air quality and air basin attainment of the NAAQS and CAAQS.

While equipment could operate at any work area identified for this alternative, the highest level of NO_X emissions in the SMAQMD is expected to occur at those sites where the duration and intensity of construction activities would be greatest. This includes all intake and intake pumping plant sites along the east bank of the Sacramento River, as well as the intermediate forebay (and control structure) site west of South Stone Lake and east of the Sacramento River.

DWR has identified several environmental commitments to reduce construction-related criteria pollutants in the SMAQMD. These commitments include performance standards for newer and cleaner off-road equipment, marine vessels, and haul trucks. All tunneling locomotives would be required to utilize Tier 4 engines, and air district recommended BMPs for proper engine maintenance and idling restrictions would also be implemented. These environmental commitments will reduce construction-related emissions; however, as shown in Table 22-99, NO_X emissions would still exceed SMAQMD regional threshold identified in Table 22-8 and would result in an adverse effect to air quality. Mitigation Measures AQ-1a and AQ-1b would be available to reduce NO_X emissions, and would thus address regional effects related to secondary ozone and PM formation.

***CEQA Conclusion*:** NO_X emissions generated during construction would exceed SMAQMD regional threshold identified in Table 22-8. Since NO_X is a precursor to ozone and PM, exceedances of SMAQMD's daily NO_X threshold could impact both regional ozone and PM formation. SMAQMD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS or NAAQS. The impact of generating NO_X emissions in excess of local air district thresholds would therefore violate applicable air quality standards in the study area and could contribute to or worsen an existing air quality conditions. This would be a significant impact. Mitigation Measures AQ-1a and AQ-1b would be available to reduce NO_X emissions to a less-than-significant level by offsetting emissions to quantities below SMAQMD CEQA thresholds (see Table 22-8).

Mitigation Measure AQ-1a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants[40]

DWR will reduce criteria pollutant emissions generated by the construction of the water conveyance facilities associated with BDCP within the SFNA through the creation of offsetting reductions of emissions. The preferred means of undertaking such offsite mitigation shall be through a partnership with the SMAQMD involving the payment of offsite mitigation fees. Criteria pollutants in excess of the federal *de minimis* thresholds shall be reduced to net zero (0) (see Table 22-8). Criteria pollutants not in excess of the *de minimis* thresholds, but above any

[40] In the title of this mitigation measure, the phrase "for other pollutants" is intended to apply to other alternatives, where associated impacts to other pollutants may exceed thresholds other than NO_X.

applicable air pollution control or air quality management district CEQA thresholds[41] shall be reduced to quantities below the numeric thresholds (see Table 22-8).[42]

DWR will undertake in good faith an effort to enter into a development mitigation contract with SMAQMD in order to reduce criteria pollutant emissions generated by the construction of the water conveyance facilities associated with BDCP. The preferred source of emissions reductions for NO_X, PM, and ROG shall be through contributions to SMAQMD's HDLEVIP. The HDLEVIP is designed to reduce NO_X, PM, and ROG from on- and offroad sources. The program is managed and implemented by SMAQMD on behalf of all air districts within the SFNA, including the YSAQMD.

SMAQMD's incentive programs are a means of funding projects and programs capable of achieving emissions reductions. The payment fee is based on the average cost to achieve one tpd of reductions based on the average cost for reductions over the previous year. Onroad reductions averaged (nominally) $44 million ($NO_X$ only) and off-road reductions averaged $36 million ($NO_X$ only) over the previous year, thus working out to approximately $40 million per one tpd of reductions. This rate roughly correlates to the average cost effectiveness of the Carl Moyer Incentive Program.

If DWR is successful in reaching what it regards as a satisfactory agreement with SMAQMD, DWR will enter into mitigation contracts with SMAQMD to reduce NO_X, PM, or ROG (as appropriate) emissions to the required levels. Such reductions may occur within the SMAQMD and/or within another air district within the SFNA. The required levels are:

- For emissions in excess of the federal *de minimis* threshold: **net zero (0)** (see Table 22-9).
- For emissions not in excess of *de minimis* thresholds but above the appropriate SMAQMD standards: **below the appropriate CEQA threshold levels**. (see Table 22-8)

Implementation of this mitigation would require DWR to adopt the following specific responsibilities.

- Consult with the SMAQMD in good faith with the intention of entering into a mitigation contract with SMAQMD for the HDLEVIP. For SIP purposes, the necessary reductions must be achieved (contracted and delivered) by the applicable year in question (i.e., emissions generated in year 2016 would need to be reduced offsite in 2016). Funding would need to be received prior to contracting with participants and should allow sufficient time to receive and process applications to ensure offsite reduction projects are funded and implemented prior to commencement of BDCP activities being reduced. This would roughly equate to the equivalent of two years prior to the required mitigation; additional lead time may be necessary depending on the level of offsite emission reductions required for a specific year.

---

[41] For example, NOx emissions in a certain year may exceed SMAQMD's 85 pound per day CEQA threshold, but not the 25 ton annual *de minimis* threshold. According to Appendix G of the State CEQA Guidelines, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make determinations regarding the significance of an impact.

[42] For example, emissions of NO_X generated by Alternative 4 both exceed the federal *de minimis* threshold for the SVAB and the SMAQMD's CEQA threshold. NO_X emissions must therefore be reduced to net zero (0).

In negotiating the terms of the mitigation contract, DWR and SMAQMD should seek clarification and agreement on SMAQMD responsibilities, including the following.

- Identification of appropriate offsite mitigation fees required for BDCP.
- Timing required for obtaining necessary offsite emission credits.
- Processing of mitigation fees paid by DWR.
- Verification of emissions inventories submitted by DWR.
- Verification that offsite fees are applied to appropriate mitigation programs within the SFNA.

- Quantify mitigation fees required to satisfy the appropriate reductions. As noted above, the payment fees may vary by year and are sensitive to the number of projects requiring reductions within the SFNA. The schedule in which payments are provided to SMAQMD also influences overall cost. For example, a higher rate on a per-tonnage basis will be required for project elements that need accelerated equipment turn-over to achieve near-term reductions, whereas project elements that are established to contract to achieve far-term reductions will likely pay a lower rate on a per-tonnage basis.
- Develop a compliance program to calculate emissions and collect fees from the construction contractors for payment to SMAQMD. The program will require, as a standard or specification of their construction contracts with DWR, that construction contractors identify construction emissions and their share of required offsite fees, if applicable. Based on the emissions estimates, DWR will collect fees from the individual construction contractors (as applicable) for payment to SMAQMD. Construction contractors will have the discretion to reduce their construction emissions to the lowest possible level through additional onsite mitigation, as the greater the emissions reductions that can be achieved by onsite mitigation, the lower the required offsite fee. Acceptable options for reducing emissions may include use of late-model engines, low-emission diesel products, additional electrification or alternative fuels, engine-retrofit technology, and/or after-treatment products. All control strategies must be verified by SMAQMD.
- Conduct daily and annual emissions monitoring to ensure onsite emissions reductions are achieved and no additional mitigation payments are required. Excess offsite funds can be carried from previous to subsequent years in the event that additional reductions are achieved by onsite mitigation. At the end of the project, if it is determined that excess offset funds remain (outstanding contracts and administration over the final years of the contracts will be taken into consideration), SMAQMD and DWR shall determine the disposition of final funds (e.g., additional emission reduction projects to offset underperforming contracts, return of funds to DWR, etc.).

If a sufficient number of emissions reduction projects are not identified to meet the required performance standard, DWR will coordinate with SMAQMD to ensure the performance standards of achieving net zero (0) for emissions in excess of General Conformity *de minimis* thresholds (where applicable) and of achieving quantities below applicable CEQA thresholds for other pollutants not in excess of the *de minimis* thresholds but above CEQA thresholds are met.

Mitigation Measure AQ-1b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions

within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants

Should DWR be unable to enter into what they regard as a satisfactory agreement with SMAQMD as contemplated by Mitigation Measure AQ-1a, or should DWR enter into an agreement with SMAQMD but find themselves unable to meet the performance standards set forth in Mitigation Measure AQ-1a, DWR will develop an alternative or complementary offsite mitigation program to reduce criteria pollutant emissions generated by the construction of the water conveyance facilities associated with BDCP. The offsite mitigation program will offset criteria pollutant emissions to the required levels identified in Mitigation Measure AQ-1a. Accordingly, the program will ensure that the project does not contribute to or worsen existing air quality exceedances. Whether this program will address emissions beyond NO_X, PM, or ROG, will turn on whether DWR has achieved sufficient reductions of those pollutants pursuant to Mitigation Measure AQ-1a.

The offsite mitigation program will establish a program to fund emission reduction projects through grants and similar mechanisms. All projects must provide contemporaneous (occur in the same calendar year as the emission increases) and localized (i.e., within the SFNA) emissions benefit to the area of effect. DWR may identify emissions reduction projects through consultation with SMAQMD, other air districts within the SFNA, and ARB, as needed. Potential projects could include, but are not limited to the following.

- Alternative fuel, low-emission school buses, transit buses, and other vehicles.
- Diesel engine retrofits and repowers.
- Locomotive retrofits and repowers.
- Electric vehicle or lawn equipment rebates.
- Electric vehicle charging stations and plug-ins.
- Video-teleconferencing systems for local businesses.
- Telecommuting start-up costs for local businesses.

As part of its alternative or complementary offsite mitigation program, DWR will develop pollutant-specific formulas to monetize, calculate, and achieve emissions reductions in a cost-effective manner. Construction contractors, as a standard specification of their construction contracts with DWR, will identify construction emissions and their share of required offset fees. DWR will verify the emissions estimates submitted by the construction contractors and calculate the required fees. Construction contractors (as applicable) will be required to surrender required fees to DWR prior to the start of construction. Construction contractors will have the discretion to reduce their construction emissions to the lowest possible level through additional onsite mitigation, as the greater the emissions reductions that can be achieved by onsite mitigation, the lower the required offset fee. Acceptable options for reducing emissions may include, but are not limited to, the use of late-model engines, low-emission diesel products, additional electrification or alternative fuels, engine-retrofit technology, and/or after-treatment products. All control strategies must be verified by SMAQMD, the ARB, any relevant air pollution control or air quality management district within the SFNA, or by a qualified air quality expert employed by or retained by DWR.

The offsite fee, grant, or other mechanism will be calculated or formulated based on the actual cost of pollutant reductions. No collected offset fees will be used to cover administrative costs; offset fees or other payments are strictly limited to procurement of offsite emission reductions. Fees or other payments collected by DWR will be allocated to emissions reductions projects in a grant-like manner. DWR shall document the fee schedule basis, such as consistency with the ARB's Carl Moyer Program cost-effectiveness limits and capital recovery factors.

DWR will conduct annual reporting to verify and document that emissions reductions projects achieve a 1:1 reduction with construction emissions to ensure claimed offsets meet the required performance standard. All offsite reductions must be quantifiable, verifiable, enforceable, and satisfy the basic criterion of additionally (i.e., the reductions would not happen without the financial support of purchased offset credits). Annual reports will include, at a minimum the following components.

- Total amount of offset fees received.
- Total fees distributed to offsite projects.
- Total fees remaining.
- Projects funded and associated pollutant reductions realized.
- Total emission reductions realized.
- Total emissions reductions remaining to satisfy the requirements of Mitigation Measure AQ-1b.
- Overall cost-effectiveness of the projects funded.

If a sufficient number of emissions reduction projects are not identified to meet the required performance standard, DWR will consult with SMAQMD, the ARB, any relevant air pollution control or air quality management district within the SFNA, or a qualified air quality expert employed by or retained by DWR to ensure conformity is met through some other means of achieving the performance standards of achieving net zero (0) for emissions in excess of General Conformity *de minimis* thresholds (where applicable) and of achieving quantities below applicable CEQA thresholds for other pollutants.

Impact AQ-2: Generation of Criteria Pollutants in Excess of the YSAQMD Regional Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: As shown in Table 22-98, construction emissions would not exceed YSAQMD regional thresholds (NO_X emissions in 2025 are 9.7 tons). Accordingly, the alternative would not contribute to or worsen existing air quality conditions. There would be no adverse effect.

CEQA Conclusion**:** Construction emission would not exceed YSAQMD's regional thresholds identified in Table 22-8. Accordingly, the alternative would not contribute to or worsen existing air quality conditions. This impact would be less than significant. No mitigation is required.

Impact AQ-3: Generation of Criteria Pollutants in Excess of the BAAQMD Regional Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: As shown in Table 22-98, construction emissions associated with Alternative 4 would exceed BAAQMD's daily thresholds for the following pollutants and years, even with implementation of environmental commitments. All other pollutants would be below air district thresholds and therefore would not result in an adverse air quality effect.

- ROG: 2020–2028
- NO_X: 2018–2029

Since ROG and NO_X are precursors to ozone and NO_X is a precursor to PM, exceedances of BAAQMD's ROG and NO_X thresholds could impact both regional ozone and PM formation, which could worsen regional air quality and air basin attainment of the NAAQS and CAAQS.

While equipment could operate at any work area identified for this alternative, the highest level of ROG and NO_X emissions in the BAAQMD are expected to occur at those sites where the duration and intensity of construction activities would be greatest, including the site of the Byron Tract Forebay adjacent to and south of Clifton Court Forebay.

Environmental commitments outlined in Appendix 3B, *Environmental Commitments,* will reduce construction-related emissions; however, as shown in Table 22-98, ROG and NO_X emissions would still exceed the applicable air district thresholds identified in Table 22-8 and would result in an adverse effect to air quality. Mitigation Measures AQ-3a and AQ-3b are available to reduce ROG and NO_X emissions, and would thus address regional effects related to secondary ozone and PM formation.

CEQA Conclusion**:** Emissions of ROG and NO_X generated during construction would exceed BAAQMD regional thresholds identified in Table 22-8. Since ROG and NO_X are precursors to ozone and NO_X is a precursor to PM, exceedances of BAAQMD's ROG and NO_X thresholds could impact both regional ozone and PM formation. BAAQMD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS or NAAQS. The impact of generating ROG and NO_X emissions in excess of BAAQMD's regional thresholds would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. This would be a significant impact. Mitigation Measures AQ-3a and AQ-3b would be available to reduce ROG and NO_X emissions to a less-than-significant level by offsetting emissions to quantities below BAAQMD CEQA thresholds (see Table 22-8).

Mitigation Measure AQ-3a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within BAAQMD/SFBAAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable BAAQMD CEQA Thresholds for Other Pollutants[43]

DWR will reduce criteria pollutant emissions generated by the construction of the water conveyance facilities associated with BDCP within the BAAQMD through the creation of offsetting reductions of emissions occurring within the SFBAAB. The preferred means of undertaking such offsite mitigation shall be through a partnership with the BAAQMD involving the payment of offsite mitigation fees. Criteria pollutants in excess of the federal *de minimis* thresholds shall be reduced to net zero (0) (see Table 22-9). Criteria pollutants not in excess of the *de minimis* thresholds, but above any applicable air pollution control or air quality

[43] In the title of this mitigation measure, the phrase "for other pollutants" is intended to apply to other alternatives, where associated impacts to other pollutants may exceed thresholds other than NO_X.

management district CEQA thresholds[44] shall be reduced to quantities below the numeric thresholds (see Table 22-8).

DWR will undertake in good faith an effort to enter into a development mitigation contract with BAAQMD in order to reduce criteria pollutant emissions generated by the construction of the water conveyance facilities associated with BDCP within the BAAQMD. The preferred source of emissions reductions for NO_X, ROG, and PM shall be through contributions to BAAQMD's Carl Moyer Program and/or other BAAQMD incentive programs (e.g., TFCA).

If DWR is successful in reaching what it regards as a satisfactory agreement with BAAQMD, DWR will enter into mitigation contracts with BAAQMD to reduce NO_X, PM, or ROG (as appropriate) emissions to the required levels. Such reductions may occur within the SFBAAB. The required levels are:

- For emissions in excess of the federal *de minimis* threshold: **net zero (0)** (see Table 22-9).
- For emissions not in excess of *de minimis* thresholds but above the appropriate BAAQMD standards: **below the appropriate CEQA threshold levels**. (see Table 22-8)

Implementation of this mitigation would require DWR adopt the following specific responsibilities.

- Consult with the BAAQMD in good faith with the intention of entering into a mitigation contract with BAAQMD for the Carl Moyer Program and/or other BAAQMD emission reduction incentive program. For SIP purposes, the necessary reductions must be achieved (contracted and delivered) by the applicable year in question (i.e., emissions generated in year 2016 would need to be reduced offsite in 2016). Funding would need to be received prior to contracting with participants and should allow sufficient time to receive and process applications to ensure offsite reduction projects are funded and implemented prior to commencement of BDCP activities being reduced. In negotiating the terms of the mitigation contract, DWR and BAAQMD should seek clarification and agreement on BAAQMD responsibilities, including the following.
    - Identification of appropriate offsite mitigation fees required for BDCP.
    - Timing required for obtaining necessary offsite emission credits.
    - Processing of mitigation fees paid by DWR.
    - Verification of emissions inventories submitted by DWR.
    - Verification that offsite fees are applied to appropriate mitigation programs within the SFBAAB.
- Quantify mitigation fees required to satisfy the appropriate reductions. Funding for the emission reduction projects will be provided in an amount up to the emission reduction project cost-effectiveness limit set by for the Carl Moyer Program during the year that the

[44] For example, NOx emissions in a certain year may exceed BAAQMD's 54 pound per day CEQA threshold, but not the 100 ton annual *de minimis* threshold. According to Appendix G of the State CEQA Guidelines, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make determinations regarding the significance of an impact.

emissions from construction are emitted. (The current emissions limit is $17,720 / weighted ton of criteria pollutants [NO_X + ROG + (20*PM)]). An administrative fee of 5% would be paid by DWR to the BAAQMD to implement the program. The funding would be used to fund projects eligible for funding under the Carl Moyer Program guidelines or other BAAQMD emission reduction incentive program meeting the same cost-effectiveness threshold that are real, surplus, quantifiable, and enforceable.

- Develop a compliance program to calculate emissions and collect fees from the construction contractors for payment to BAAQMD. The program will require, as a standard or specification of their construction contracts with DWR, that construction contractors identify construction emissions and their share of required offsite fees, if applicable. Based on the emissions estimates, DWR will collect fees from the individual construction contractors (as applicable) for payment to BAAQMD. Construction contractors will have the discretion to reduce their construction emissions to the lowest possible level through additional onsite mitigation, as the greater the emissions reductions that can be achieved by onsite mitigation, the lower the required offsite fee. Acceptable options for reducing emissions may include use of late-model engines, low-emission diesel products, additional electrification or alternative fuels, engine-retrofit technology, and/or after-treatment products. All control strategies must be verified by BAAQMD.
- Conduct daily and annual emissions monitoring to ensure onsite emissions reductions are achieved and no additional mitigation payments are required. Excess offsite funds can be carried from previous to subsequent years in the event that additional reductions are achieved by onsite mitigation. At the end of the project, if it is determined that excess offset funds remain (outstanding contracts and administration over the final years of the contracts will be taken into consideration), BAAQMD and DWR shall determine the disposition of final funds (e.g., additional emission reduction projects to offset underperforming contracts, return of funds to DWR, etc.).

If a sufficient number of emissions reduction projects are not identified to meet the required performance standard, the DWR will coordinate with BAAQMD to ensure the performance standards of achieving net zero (0) for emissions in excess of General Conformity *de minimis* thresholds (where applicable) and of achieving quantities below applicable BAAQMD CEQA thresholds for other pollutants not in excess of the *de minimis* thresholds but above BAAQMD CEQA thresholds are met.

Mitigation Measure AQ-3b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the BAAQMD/SFBAAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable BAAQMD CEQA Thresholds for Other Pollutants

Should DWR be unable to enter into what they regard as a satisfactory agreement with BAAQMD as contemplated by Mitigation Measure AQ-3a, or should DWR enter into an agreement with BAAQMD but find themselves unable to meet the performance standards set forth in Mitigation Measure AQ-3a, DWR will develop an alternative or complementary offsite mitigation program to reduce criteria pollutant emissions generated by the construction of the water conveyance facilities associated with BDCP. The offsite mitigation program will offset criteria pollutant emissions to the required levels identified in Mitigation Measure AQ-3a. Accordingly, the program will ensure that the project does not contribute to or worsen existing air quality exceedances. Whether this program will address emissions beyond NO_X, PM, or ROG, will turn on whether DWR has achieved sufficient reductions of those pollutants pursuant to Mitigation Measure AQ-3a.

The offsite mitigation program will establish a program to fund emission reduction projects through grants and similar mechanisms. All projects must provide contemporaneous (occur in the same calendar year as the emission increases) and localized (i.e., within the SFBAAB) emissions benefit to the area of effect. DWR may identify emissions reduction projects through consultation with BAAQMD and ARB, as needed. Potential projects could include, but are not limited to the following.

- Alternative fuel, low-emission school buses, transit buses, and other vehicles.
- Diesel engine retrofits and repowers.
- Locomotive retrofits and repowers.
- Electric vehicle or lawn equipment rebates.
- Electric vehicle charging stations and plug-ins.
- Video-teleconferencing systems for local businesses.
- Telecommuting start-up costs for local businesses.

As part of its alternative or complementary offsite mitigation program, DWR will develop pollutant-specific formulas to monetize, calculate, and achieve emissions reductions in a cost-effective manner. Construction contractors, as a standard specification of their construction contracts with DWR, will identify construction emissions and their share of required offset fees. DWR will verify the emissions estimates submitted by the construction contractors and calculate the required fees. Construction contractors (as applicable) will be required to surrender required fees to DWR prior to the start of construction. Construction contractors will have the discretion to reduce their construction emissions to the lowest possible level through additional onsite mitigation, as the greater the emissions reductions that can be achieved by onsite mitigation, the lower the required offset fee. Acceptable options for reducing emissions may include, but are not limited to, the use of late-model engines, low-emission diesel products, additional electrification or alternative fuels, engine-retrofit technology, and/or after-treatment products. All control strategies must be verified by BAAQMD, the ARB, or by a qualified air quality expert employed by or retained by DWR.

The offsite fee, grant, or other mechanism will be calculated or formulated based on the actual cost of pollutant reductions. No collected offset fees will be used to cover administrative costs; offset fees or other payments are strictly limited to procurement of offsite emission reductions. Fees or other payments collected by DWR will be allocated to emissions reductions projects in a grant-like manner. DWR shall document the fee schedule basis, such as consistency with the ARB's Carl Moyer Program cost-effectiveness limits and capital recovery factors.

DWR will conduct annual reporting to verify and document that emissions reductions projects achieve a 1:1 reduction with construction emissions to ensure claimed offsets meet the required performance standard. All offsite reductions must be quantifiable, verifiable, enforceable, and satisfy the basic criterion of additionally (i.e., the reductions would not happen without the financial support of purchased offset credits). Annual reports will include, at a minimum the following components.

- Total amount of offset fees received.
- Total fees distributed to offsite projects.
- Total fees remaining.
- Projects funded and associated pollutant reductions realized.
- Total emission reductions realized.
- Total emissions reductions remaining to satisfy the requirements of Mitigation Measure AQ-3b.
- Overall cost-effectiveness of the projects funded.

If a sufficient number of emissions reduction projects are not identified to meet the required performance standard, DWR will consult with BAAQMD, the ARB, or a qualified air quality expert employed by or retained by DWR to ensure conformity is met through some other means of achieving the performance standards of achieving net zero (0) for emissions in excess of General Conformity de minimis thresholds (where applicable) and of achieving quantities below applicable BAAQMD CEQA thresholds for other pollutants.

Impact AQ-4: Generation of Criteria Pollutants in Excess of the SJVAPCD Regional Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: As shown in Table 22-99, construction emissions would exceed SJVAPCD's regional thresholds for the following pollutants and years, even with implementation of environmental commitments. All other pollutants would be below air district thresholds and therefore would not result in an adverse air quality effect.

- ROG: 2020-2025
- NO_X: 2018-2028
- PM10: 2019-2025

Since ROG and NO_X are precursors to ozone and NO_X is a precursor to PM, exceedances of SJVAPCD's ROG and NO_X thresholds could impact both regional ozone and PM formation, which could worsen regional air quality and air basin attainment of the NAAQS and CAAQS. Similarly, exceedances of SJVAPCD's PM10 threshold could impede attainment of the NAAQS and CAAQS for PM10.

While equipment could operate at any work area identified for this alternative, the highest level of ROG, NO_X, and PM10 emissions in the SJVAPCD is expected to occur at those sites where the duration and intensity of construction activities would be greatest. This includes all temporary and permanent utility sites, as well as all construction sites along the modified pipeline/tunnel conveyance alignment. For a map of the proposed tunnel alignment under this alternative, see Mapbook Figure M3-4.

Environmental commitments outlined in Appendix 3B, *Environmental Commitments,* will reduce construction-related emissions; however, as shown in Table 22-99, ROG, NO_X, and PM10 emissions would still exceed SJVAPCD's regional thresholds identified in Table 22-8 and would result in an adverse effect to air quality. Mitigation Measures AQ-4a and AQ-4b are available to reduce ROG, NO_X, and PM10 emissions, and would thus address regional effects related to secondary ozone and PM formation.

CEQA Conclusion: Emissions of ROG, NO_X, and PM10 generated during construction would exceed SJVAPCD's regional significance threshold identified in Table 22-8. Since ROG and NO_X are precursors to ozone and NO_X is a precursor to PM, exceedances of SJVAPCD's ROG and NO_X thresholds could impact both regional ozone and PM formation, which could worsen regional air quality and air basin attainment of the NAAQS and CAAQS. Similarly, exceedances of SJVAPCD's PM10 threshold could impede attainment of the NAAQS and CAAQS for PM10. SJVAPCD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS or NAAQS. The impact of generating ROG, NO_X, and PM10 emissions in excess of SJVAPCD's regional thresholds would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. This would be a significant impact. Mitigation Measures AQ-4a and AQ-4b would be available to reduce ROG, NO_X, and PM10 emissions to a less-than-significant level by offsetting emissions to quantities below SJVAPCD CEQA thresholds (see Table 22-8).

Mitigation Measure AQ-4a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants[45]

DWR will reduce criteria pollutant emissions generated by the construction of the water conveyance facilities associated with BDCP within the SJVAPCD through the creation of offsetting reductions of emissions occurring within the SJVAB. The preferred means of undertaking such offsite mitigation shall be through a partnership with the SJVAPCD involving the payment of offsite mitigation fees. Criteria pollutants in excess of the federal *de minimis* thresholds shall be reduced to net zero (0) (see Table 22-8). Criteria pollutants not in excess of the *de minimis* thresholds, but above any applicable air pollution control or air quality management district CEQA thresholds[46] shall be reduced to quantities below the numeric thresholds (see Table 22-8).[47]

DWR will undertake in good faith an effort to enter into a development mitigation contract with SJVAPCD in order to reduce criteria pollutant emissions generated by the construction of the water conveyance facilities associated with BDCP within the SJVAPCD. The preferred source of emissions reductions for NO_X, PM, and ROG shall be through contributions to SJVAPCD's VERA. The VERA is implemented through the District Incentive Programs and is a measure to reduce project impacts under CEQA. The current VERA payment fee for construction emissions is $9,350 per ton of NO_X. This is an estimated cost and may change in the future (e.g., future year

[45] In the title of this mitigation measure, the phrase "for other pollutants" is intended to apply to other alternatives, where associated impacts to other pollutants may exceed thresholds other than NO_X.

[46] For example, PM10 emissions in a certain year may exceed SJVAPCD's 15 ton annual CEQA threshold, but not the 100 ton annual *de minimis* threshold. According to Appendix G of the State CEQA Guidelines, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make determinations regarding the significance of an impact.

[47] For example, emissions of NO_X generated by Alternative 1A both exceed the federal *de minimis* threshold for the SJVAB and the SJVAPCD's CEQA threshold. NO_X emissions must therefore be reduced to net zero (0).

payment fees for NO_X could be in excess of the current price of $9,350) and are sensitive to the number and type of projects requiring emission reductions within the same air basin (Siong pers. comm. 2012).

If DWR is successful in reaching what it regards as a satisfactory agreement with SJVAPCD, DWR will enter into mitigation contracts with SJVAPCD to reduce NO_X, PM, or ROG (as appropriate) emissions to the required levels. Such reductions must occur within the SJVAB. required levels are:

- For emissions in excess of the federal *de minimis* threshold: **net zero (0)**.
- For emissions not in excess of *de minimis* thresholds but above the SJVAPCD's standards: **below the appropriate CEQA threshold levels**.

Implementation of this measure would require DWR to adopt the following specific responsibilities.

- Consult with the SJVAPCD in good faith with the intention of entering into a mitigation contract with SJVAPCD for the VERA. For SIP purposes, the necessary reductions must be achieved (contracted and delivered) by the applicable year in question (i.e., emissions generated in year 2016 would need to be reduced offsite in 2016). Funding would need to be received prior to contracting with participants and should allow sufficient time to receive and process applications to ensure offsite reduction projects are funded and implemented prior to commencement of BDCP activities being reduced. This would roughly equate to the equivalent of two months (2) prior to groundbreaking; additional lead time may be necessary depending on the level of offsite emission reductions required for a specific year. In negotiating the terms of the mitigation contract, DWR and SJVAPCD should seek clarification and agreement on SJVAPCD responsibilities, including the following.
    - Identification of appropriate offsite mitigation fees required for BDCP.
    - Processing of mitigation fees paid by DWR.
    - Verification of emissions inventories submitted by DWR
    - Verification that offsite fees are applied to appropriate mitigation programs within the SJVAB.
- Quantify mitigation fees required to satisfy the appropriate reductions. An administrative fee of 4% would be paid by DWR to the SJVAPCD to implement the program. As noted above, the payment fees may vary by year and are sensitive to the number of projects requiring reductions within the SJVAB.
- Develop a compliance program to calculate emissions and collect fees from the construction contractors for payment to SJVAPCD. The program will require, as a standard or specification of their construction contracts with DWR, that construction contractors identify construction emissions and their share of required offsite fees, if applicable. Based on the emissions estimates, DWR will collect fees from the individual construction contractors (as applicable) for payment to SJVAPCD. Construction contractors will have the discretion to reduce their construction emissions to the lowest possible level through additional onsite mitigation, as the greater the emissions reductions that can be achieved by onsite mitigation, the lower the required offsite fee. Acceptable options for reducing emissions may include use of late-model engines, low-emission diesel products, additional

electrification or alternative fuels, engine-retrofit technology, and/or after-treatment products. All control strategies must be verified by SJVAPCD.

- Conduct daily and annual emissions monitoring to ensure onsite emissions reductions are achieved and no additional mitigation payments are required. Excess offsite funds can be carried from previous to subsequent years in the event that additional reductions are achieved by onsite mitigation. At the end of the project, if it is determined that excess offset funds remain (outstanding contracts and administration over the final years of the contracts will be taken into consideration), SJVAPCD and DWR shall determine the disposition of final funds (e.g., additional emission reduction projects to offset underperforming contracts, return of funds to DWR, etc.).

If a sufficient number of emissions reduction projects are not identified to meet the required performance standard, DWR will coordinate with SJVAPCD to ensure the performance standards of achieving net zero (0) for emissions in excess of General Conformity *de minimis* thresholds (where applicable) and of achieving quantities below applicable SJVAPCD CEQA thresholds for other pollutants not in excess of the *de minimis* thresholds but above SJVAPCD CEQA thresholds are met.

Mitigation Measure AQ-4b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Should DWR be unable to enter into what they regard as a satisfactory agreement with SJVAPCD as contemplated by Mitigation Measure AQ-4a, or should DWR enter into an agreement with SJVAPCD but find themselves unable to meet the performance standards set forth in Mitigation Measure AQ-4a, DWR will develop an alternative or complementary offsite mitigation program to reduce criteria pollutant emissions generated by the construction of the water conveyance facilities associated with BDCP. The offsite mitigation program will offset criteria pollutant emissions to the required levels identified in Mitigation Measure AQ-4a. Accordingly, the program will ensure that the project does not contribute to or worsen existing air quality exceedances. Whether this program will address emissions beyond NO_X, PM, or ROG, will turn on whether DWR has achieved sufficient reductions of those pollutants pursuant to Mitigation Measure AQ-4a.

The offsite mitigation program will establish a program to fund emission reduction projects through grants and similar mechanisms. All projects must provide contemporaneous (occur in the same calendar year as the emission increases) and localized (i.e., within the SJVAB) emissions benefit to the area of effect. DWR may identify emissions reduction projects through consultation with SJVAPCD and ARB, as needed. Potential projects could include, but are not limited to the following.

- Alternative fuel, low-emission school buses, transit buses, and other vehicles.
- Diesel engine retrofits and repowers.
- Locomotive retrofits and repowers.
- Electric vehicle or lawn equipment rebates.

- Electric vehicle charging stations and plug-ins.
- Video-teleconferencing systems for local businesses.
- Telecommuting start-up costs for local businesses.

As part of its alternative or complementary offsite mitigation program, DWR will develop pollutant-specific formulas to monetize, calculate, and achieve emissions reductions in a cost-effective manner. Construction contractors, as a standard specification of their construction contracts with DWR, will identify construction emissions and their share of required offset fees. DWR will verify the emissions estimates submitted by the construction contractors and calculate the required fees. Construction contractors (as applicable) will be required to surrender required fees to DWR prior to the start of construction. Construction contractors will have the discretion to reduce their construction emissions to the lowest possible level through additional onsite mitigation, as the greater the emissions reductions that can be achieved by onsite mitigation, the lower the required offset fee. Acceptable options for reducing emissions may include, but are not limited to, the use of late-model engines, low-emission diesel products, additional electrification or alternative fuels, engine-retrofit technology, and/or after-treatment products. All control strategies must be verified by SJVAPCD, the ARB, or by a qualified air quality expert employed by or retained by DWR.

The offsite fee, grant, or other mechanism will be calculated or formulated based on the actual cost of pollutant reductions. No collected offset fees will be used to cover administrative costs; offset fees or other payments are strictly limited to procurement of offsite emission reductions. Fees or other payments collected by DWR will be allocated to emissions reductions projects in a grant-like manner. DWR shall document the fee schedule basis, such as consistency with the ARB's Carl Moyer Program cost-effectiveness limits and capital recovery factors.

DWR will conduct annual reporting to verify and document that emissions reductions projects achieve a 1:1 reduction with construction emissions to ensure claimed offsets meet the required performance standard. All offsite reductions must be quantifiable, verifiable, enforceable, and satisfy the basic criterion of additionally (i.e., the reductions would not happen without the financial support of purchased offset credits). Annual reports will include, at a minimum the following components.

- Total amount of offset fees received.
- Total fees distributed to offsite projects.
- Total fees remaining.
- Projects funded and associated pollutant reductions realized.
- Total emission reductions realized.
- Total emissions reductions remaining to satisfy the requirements of Mitigation Measure AQ-4b.
- Overall cost-effectiveness of the projects funded.

If a sufficient number of emissions reduction projects are not identified to meet the required performance standard, DWR will consult with SJVAPCD, the ARB, or a qualified air quality expert employed by or retained by DWR to ensure conformity is met through some other means of achieving the performance standards of achieving net zero (0) for emissions in excess of General

Conformity *de minimis* thresholds (where applicable) and of achieving quantities below applicable SJVAPCD CEQA thresholds for other pollutants.

Impact AQ-5: Generation of Criteria Pollutants in Excess of the SMAQMD Regional Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance in SMAQMD include both routine activities and yearly maintenance. Daily activities at all pumping plants and intakes are covered by maintenance, management, repair, and operating crews. Yearly maintenance would include annual inspections, tunnel dewatering, and sediment removal (see Appendix 22A, *Air Quality Analysis Methodology,* for additional detail). The highest concentration of operational emissions in the SMAQMD are expected at intake and intake pumping plant sites along the east bank of the Sacramento River, as well as at the intermediate forebay (and control structure) site west of South Stone Lake and east of the Sacramento River. As shown in Table 22-100, operation and maintenance activities under Alternative 4 would not exceed SMAQMD's regional thresholds of significance and there would be no adverse effect (see Table 22-8). Accordingly, project operations would not contribute to or worsen existing air quality exceedances. There would be no adverse effect.

***CEQA Conclusion*:** Emissions generated during operation and maintenance activities would not exceed SMAQMD regional thresholds for criteria pollutants. SMAQMD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Because project operations would not exceed SMAQMD regional thresholds, the impact would be less than significant. No mitigation is required.

Impact AQ-6: Generation of Criteria Pollutants in Excess of the YSAQMD Regional Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Alternative 4 would not construct any permanent features in the YSAQMD that would require routine operations and maintenance. No operational emissions would be generated in the YSAQMD. Consequently, operation of Alternative 4 would neither exceed the YSAQMD regional thresholds of significance nor result in an adverse effect to air quality.

***CEQA Conclusion*:** No operational emissions would be generated in the YSAQMD. Consequently, operation of Alternative 4 would not exceed the YSAQMD regional thresholds of significance. This impact would be less than significant. No mitigation is required.

Impact AQ-7: Generation of Criteria Pollutants in Excess of the BAAQMD Regional Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance in BAAQMD include both routine activities and major inspections. Daily activities at the pumping plants are covered by maintenance, management, repair, and operating crews. Yearly maintenance would include annual inspections, tunnel dewatering, and sediment removal (see Appendix 22A, *Air Quality Analysis Methodology,* for additional detail). The highest concentration of operational emissions in the BAAQMD is expected at the Byron Tract Forebay and Clifton Court Forebay (including control gates and the combined pumping plant). As shown in Table 22-100, operation and maintenance activities under Alternative 4 would not exceed BAAQMD's thresholds of significance (see Table 22-8). Thus, project operations would not contribute to or worsen existing air quality exceedances. There would be no adverse effect.

***CEQA Conclusion*:** Emissions generated during operation and maintenance activities would not exceed BAAQMD regional thresholds for criteria pollutants. BAAQMD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district thresholds would violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Because project operations would not exceed BAAQMD regional thresholds, the impact would be less than significant. No mitigation is required.

Impact AQ-8: Generation of Criteria Pollutants in Excess of the SJVAPCD Regional Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance in SJVAPCD include annual inspections and tunnel dewatering (see Appendix 22A, *Air Quality Analysis Methodology,* for additional detail). The highest concentration of operational emissions in the SJVPACD is expected at routine inspection sites along the modified pipeline/tunnel conveyance alignment. For a map of the proposed tunnel alignment under this alternative, see Mapbook Figure M3-4. As shown in Table 22-100, operation and maintenance activities under Alternative 4 would not exceed SJVAPCD's thresholds of significance (see Table 22-8). Accordingly, project operations would not contribute to or worsen existing air quality exceedances. There would be no adverse effect.

***CEQA Conclusion*:** Emissions generated during operation and maintenance activities would not exceed SJVAPCD's regional thresholds of significance. SJVAPCD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district thresholds would violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Because project operations would not exceed SJVAPCD regional thresholds, the impact would be less than significant. No mitigation is required.

Impact AQ-9: Exposure of Sensitive Receptors to Health Hazards from Localized Particulate Matter in Excess of SMAQMD's Health-Based Concentration Thresholds

NEPA Effects: Respirable particulates pose a public health threat by bypassing the defenses within the mucous ciliary system and entering deep lung tissue. Particulates are derived from a variety of sources, including windblown dust and fuel combustion. As shown in Table 22-92, construction would increase PM10 and PM2.5 emissions in SMAQMD, which may pose inhalation-related health risks for receptors exposed to certain concentrations.

PM2.5 and PM10 concentrations at sensitive receptors locations were assessed using the EPA's AERMOD dispersion. The methodology described in Section 22.3.1.3 provides a more detailed summary of the approach used to conduct the analysis. Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, provides an in-depth discussion of the methodology and results.

Table 22-101 shows the highest predicted annual and daily (24-hour) PM10 and PM2.5 concentrations in SMAQMD. Exceedances of air district thresholds are shown in underline.

Table 22-101. Alternative 4 PM10 and PM2.5 Concentration Results in SMAQMD

	PM10		PM2.5	
Parameter	Annual ($\mu g/m^3$)	24-Hour ($\mu g/m^3$)	Annual ($\mu g/m^3$)	24-Hour ($\mu g/m^3$)
Maximum Value	0.4	3.2	0.06	0.52
SMAQMD Threshold	*1*	*2.5*	*0.6*	-

Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions,* includes modeling results for all receptors.
$\mu g/m^3$ = micrograms per cubic meter

All annual PM10 and PM2.5 concentrations are less than SMAQMD's annual thresholds. However, as shown in Table 22-101, the maximum predicted 24-hour PM10 threshold exceeds SMAQMD's threshold of 2.5 $\mu g/m^3$. Exceedances of the threshold would occur at 10 receptor locations near intakes, tunnels, transmission lines, and highway reconstruction. The exceedances would be temporary and occur intermittently due to soil disturbance.

DWR has identified several environmental commitments to reduce construction-related particulate matter in the SMAQMD (see Appendix 3B, *Environmental Commitments*). Consistent with air district guidance, these commitments constitute mitigation measures which include implementation of all feasible onsite fugitive dust controls, such as regular watering. While these commitments will reduce localized particulate matter emissions, concentrations at adjacent receptor locations would still exceed SMAQMD's 24-hour PM10 threshold. Receptors exposed to PM10 concentrations in excess of SMAQMD's threshold could experience increased risk for adverse human health effects. Mitigation Measure AQ-9 is available to address this effect.

CEQA Conclusion: Respirable particulates pose a human health hazard by bypassing the defenses within the mucous ciliary system and entering deep lung tissue. Construction of Alternative 4 would result in the short-term exposure of sensitive receptors to annual concentrations of PM2.5 that are below the significance thresholds established by the SMAQMD. Accordingly, no significant localized impact would occur with respect to PM2.5.

A total of 10 receptor locations would be exposed to 24-hour PM10 concentrations that exceed SMAQMD's threshold. This is a significant impact. The exceedances would occur intermittently due to soil disturbance and during days with most intensive construction activities. The significant impacts at the receptors locations are therefore temporary.

Mitigation Measure AQ-9 outlines a tiered strategy to reduce PM concentrations and public exposure to significant health hazards. Specifically, DWR will utilize dust suppressants (Pennzsuppress) on all unpaved surfaces to control fugitive dust emissions. The suppressants would be used in place of water and have a control efficiency of approximately 85% (California Air Resources Board 2012b). If concentrations still exceed air district thresholds with application of suppressants, DWR will offer relocation assistance to affected receptors. If accepted, relocation would reduce this impact to less than significant. However, if landowners choose not to accept DWR's offer of relocation assistance, DWR will pave all areas in which vehicles travel. Paving roadways reduces entrained road dust by approximately 99% (Countess Environmental 2006), and as shown in Table 22-102, would reduce PM10 concentrations at the maximum exposed receptor to below SMAQMD thresholds. Accordingly, this impact would be less than significant.

Table 22-102. Alternative 4 Mitigated PM10 and PM2.5 Concentration Results in SMAQMD

	PM10		PM2.5	
Parameter	Annual (μg/m³)	24-Hour (μg/m³)	Annual (μg/m³)	24-Hour (μg/m³)
Maximum Value	0.1	2.1	0.04	0.4
SMAQMD Threshold	*1*	*2.5*	*0.6*	-

Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions,* includes modeling results for all receptors.
μg/m³ = micrograms per cubic meter

Mitigation Measure AQ-9: Implement Measures to Reduce Re-Entrained Road Dust and Receptor Exposure to PM2.5 and PM10

The project sponsor (DWR) would employ a tiered approach to reduce re-entrained road dust and receptor exposure to PM2.5 and PM10. The approach would be taken in following way:

- PM10 that could exceed the threshold at sensitive receptors will be further reduced by applying dust suppressants (Pennzsuppress);
- If additional dust suppressants eliminate the issue at all receptors no further mitigation is needed; if not, DWR will offer temporary relocation of the affected residence; if that is accepted no additional mitigation is required; if relocation is not accepted then;
- DWR will pave portions of the work sites until all exceedances are eliminated and impacts are determined to be less than significant.

Impact AQ-10: Exposure of Sensitive Receptors to Health Hazards from Localized Particulate Matter in Excess of YSAQMD's Health-Based Concentration Thresholds

NEPA Effects: As shown in Table 22-99, construction would increase PM10 and PM2.5 emissions in YSAQMD, which may pose inhalation-related health risks for receptors exposed to certain concentrations.

PM2.5 and PM10 concentrations at sensitive receptors locations were assessed using the EPA's AERMOD dispersion. The methodology described in Section 22.3.1.3 provides a more detailed summary of the approach used to conduct the analysis. Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, provides an in-depth discussion of the methodology and results.

As shown in Table 22-103, predicted PM2.5 and PM10 concentrations are less than YSAQMD's adopted thresholds. The project would also implement all air-district recommended onsite fugitive dust controls, such as regular watering. Accordingly, this alternative's effect of exposure of sensitive receptors to localized particulate matter concentrations would not be adverse.

Table 22-103. Alternative 4 PM10 and PM2.5 Concentration Results in YSAQMD

	PM10		PM2.5	
Parameter	Annual (μg/m^3)	24-Hour (μg/m^3)	Annual (μg/m^3)	24-Hour (μg/m^3)
Maximum Value	0.6	2.5	0.01	0.4
YSAQMD Threshold	*20*	*50*	*12*	*35*

Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions,* includes modeling results for all receptors.
μg/m^3 = micrograms per cubic meter

CEQA Conclusion: Respirable particulates pose human health hazard by bypassing the defenses within the mucous ciliary system and entering deep lung tissue. Construction of Alternative 4 would result in PM2.5 and PM10 concentrations at receptor locations that are below the significance thresholds adopted by the YSAQMD. As such, localized particulate matter concentrations at analyzed receptors would not result in significant human health impacts. No mitigation is required.

Impact AQ-11: Exposure of Sensitive Receptors to Health Hazards from Localized Particulate Matter in Excess of BAAQMD's Health-Based Concentration Thresholds

NEPA Effects: As shown in Table 22-99, construction would increase PM10 and PM2.5 emissions in BAAQMD, which may pose inhalation-related health risks for receptors exposed to certain concentrations.

PM2.5 and PM10 concentrations at sensitive receptors locations were assessed using the EPA's AERMOD dispersion. The methodology described in Section 22.3.1.3 provides a more detailed summary of the approach used to conduct the analysis. Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, provides an in-depth discussion of the methodology and results.

As shown in Table 22-104, maximum predicted PM2.5 concentrations are less than BAAQMD's adopted threshold. The project would also implement all air-district recommended onsite fugitive dust controls, such as regular watering. Accordingly, this alternative's effect of exposure of sensitive receptors to localized particulate matter concentrations would not be adverse.

Table 22-104. Alternative 4 PM10 and PM2.5 Concentration Results in BAAQMD

	PM10		PM2.5	
Parameter	Annual (μg/m^3)	24-Hour (μg/m^3)	Annual (μg/m^3)	24-Hour (μg/m^3)
Maximum Value	0.21	37	0.04	6.00
BAAQMD Threshold	-	-	*0.3*	-

Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions,* includes modeling results for all receptors.
μg/m^3 = micrograms per cubic meter

CEQA Conclusion: Respirable particulates pose human health hazard by bypassing the defenses within the mucous ciliary system and entering deep lung tissue. Construction of Alternative 4 would result in PM2.5 and PM10 concentrations at receptor locations that are below the significance

thresholds established by the BAAQMD. As such, localized particulate matter concentrations at analyzed receptors would not result in significant human health impacts. No mitigation is required.

Impact AQ-12: Exposure of Sensitive Receptors to Health Hazards from Localized Particulate Matter in Excess of SJVAPCD's Health-Based Concentration Thresholds

NEPA Effects: As shown in Table 22-99, construction would increase PM10 and PM2.5 emissions in SJVAPCD, which may pose inhalation-related health risks for receptors exposed to certain concentrations.

PM2.5 and PM10 concentrations at sensitive receptors locations were assessed using the EPA's AERMOD dispersion. The methodology described in Section 22.3.1.3 provides a more detailed summary of the approach used to conduct the analysis. Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, provides an in-depth discussion of the methodology and results.

As shown in Table 22-105, predicted PM2.5 and PM10 concentrations are less than SJVAPCD's adopted threshold. The project would also implement all air-district recommended onsite fugitive dust controls, such as regular watering. Accordingly, this alternative's effect of exposure of sensitive receptors to localized particulate matter concentrations would not be adverse.

Table 22-105. Alternative 4 PM10 and PM2.5 Concentration Results in SJVAPCD

	PM10		PM2.5	
Parameter	Annual (μg/m³)	24-Hour (μg/m³)	Annual (μg/m³)	24-Hour (μg/m³)
Maximum Value	0.09	6.9	0.02	1.1
SJVAPCD Threshold	*2.08*	*10.4*	*2.08*	*10.4*

Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions,* includes modeling results for all receptors.
μg/m³ = micrograms per cubic meter

CEQA Conclusion: Respirable particulates pose human health hazard by bypassing the defenses within the mucous ciliary system and entering deep lung tissue. Construction of Alternative 4 would result in PM2.5 and PM10 concentrations at receptor locations that are below the significance thresholds established by the SJVAPCD. As such, localized particulate matter concentrations at analyzed receptors would not result in significant human health impacts. No mitigation is required.

Impact AQ-13: Exposure of Sensitive Receptors to Health Hazards from Localized Carbon Monoxide

NEPA Effects: Continuous engine exhaust may elevate localized CO concentrations. Receptors exposed to these CO "hot-spots" may have a greater likelihood of developing adverse health effects (as described in Section 22.1.2). CO hot-spots are typically observed at heavily congested intersections where a substantial number of gasoline-powered vehicles idle for prolonged durations throughout the day. Construction sites are less likely to result in localized CO hot-spots due to the nature of construction activities (Sacramento Metropolitan Air Quality Management District 2014), which normally utilize diesel-powered equipment for intermittent or short durations. Moreover, construction sites must comply with the Occupational Safety and Health Administration's (OSHA) CO exposure standards for onsite workers. Unlike regional pollutants (e.g., ROG and NO_X), CO concentrations also dissipate as a function of distance and will therefore be lower at offsite receptor locations. Accordingly, given that construction activities typically do not result in CO hot-spots, onsite concentrations must comply with OSHA standards, and CO levels dissipate as a function of distance, equipment-generated CO emissions (see Table 22-99) are not anticipated to result in adverse health hazards to sensitive receptors.

Construction traffic may contribute to increased roadway congestion, which could lead to conditions conducive to CO hot-spot formation. Chapter 19, *Transportation*, analyzes peak-hour traffic volumes during construction on local roadway segments. The assessment is inclusive of baseline traffic volumes plus background growth and project trips or 'baseline plus background growth plus project' or BPBGPP. While the traffic analysis was performed for roadway segments, as opposed to intersections, the results can be used as a conservative indication of potential traffic volumes at local intersections, assuming all vehicles would travel through a single intersection.

As shown in Table 19-29, the highest peak hour traffic volumes under BPBGPP—12,050 vehicles per hour—would occur on westbound Interstate 80 between Suisun Valley Road and State Route 12. This is about half of the congested traffic volume modeled by BAAQMD (24,000 vehicles per hour) that would be needed to contribute to a localized CO hot-spot, and less than half of the traffic volume modeled by SMAQMD (31,600 vehicles per hour). The BAAQMD's and SMAQMD's CO screening criteria were developed based on County average vehicle fleets that are primarily comprised of gasoline vehicles. Construction vehicles would be predominantly diesel trucks, which generate fewer CO emissions per idle-hour and vehicle mile traveled than gasoline-powered vehicles. Accordingly, the air district screening thresholds provide a conservative evaluation threshold for the assessment of potential CO emissions impacts during construction.

Based on the above analysis, even if all 8,088 vehicles on the modeled traffic segment drove through the same intersection in the peak hour, CO concentrations adjacent to the traveled way would not exceed the CAAQS or NAAQS according to BAAQMD's and SMAQMD's screening criteria. Thus, construction traffic is not anticipated to result in adverse health hazards to sensitive receptors.

***CEQA Conclusion*:** Continuous engine exhaust may elevate localized CO concentrations. Receptors exposed to these CO "hot-spots" may have a greater likelihood of developing adverse health effects. Construction sites are less likely to result in localized CO hot-spots due to the nature of construction activities (Sacramento Metropolitan Air Quality Management District 2014), which normally utilize diesel-powered equipment for intermittent or short durations. Moreover, construction sites must comply with the OSHA CO exposure standards for onsite workers. Accordingly, given that construction activities typically do not result in CO hot-spots, onsite concentrations must comply with OSHA standards, and CO levels dissipate as a function of distance, equipment-generated CO emissions are not anticipated to result in significant health hazards to sensitive receptors. Similarly, peak-hour construction traffic on local roadways would not exceed BAAQMD's or SMAQMD's conservative screening criteria for the formation potential CO hot-spots. This impact would be less than significant. No mitigation is required.

Impact AQ-14: Exposure of Sensitive Receptors to Health Hazards from Diesel Particulate Matter in Excess of SMAQMD's Chronic Non-Cancer and Cancer Risk Assessment Thresholds

NEPA Effects: Diesel-fueled engines, which generate DPM, would be used during construction of the proposed water conveyance facility. These coarse and fine particles may be composed of elemental carbon with adsorbed materials, such as organic compounds, sulfate, nitrate, metals, and other trace elements. The coarse and fine particles are respirable, which means that they can avoid many of the human respiratory system's defense mechanisms and enter deeply into the lungs, and as such, DPM poses inhalation-related chronic non-cancer hazard and cancer risk

As shown in Table 22-99, construction would result in an increase of DPM emissions in the Study area, particularly near sites involving the greatest duration and intensity of equipment. Receptor exposure to construction DPM emissions was assessed by predicting the health risks in terms of excess cancer and non-cancer hazard impacts using the EPA's AERMOD dispersion modeling and guidance published by OEHHA. The methodology described in Section 22.3.1.3 provides a more detailed summary of the approach used to conduct the HRA. Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, provides an in-depth discussion of the HRA methodology and results.

The results of the HRA are summarized in Table 22-106 and are compared to SMAQMD's health risk thresholds. As shown in Table 22-106, Alternative 4 would not exceed the SMAQMD's chronic non-cancer or cancer thresholds and, thus, would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to DPM emissions and their health hazards during construction would not be adverse.

***CEQA Conclusion*:** DPM generated during construction poses inhalation-related chronic non-cancer hazard and cancer risk if adjacent receptors are exposed to significant concentrations for prolonged durations. The DPM generated during Alternative 4 construction would not exceed the SMAQMD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this impact for DPM emissions would be less than significant. No mitigation is required.

Table 22-106. Alternative 4 Health Hazards in the Sacramento Metropolitan Air Quality Management District

Parameter	Chronic Health Hazard	Cancer Health Risk
Maximum Value	0.001	5 per million
Thresholds	1	10 per million

Source: Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*.

Impact AQ-15: Exposure of Sensitive Receptors to Health Hazards from Diesel Particulate Matter in Excess of YSAQMD's Chronic Non-Cancer and Cancer Risk Thresholds

NEPA Effects: As shown in Table 22-99, construction of Alternative 4 would result in an increase of DPM emissions in YSAQMD, which poses inhalation-related chronic non-cancer hazard and cancer risks if adjacent receptors are exposed to significant DPM concentrations for prolonged durations.

Receptor exposure to construction DPM emissions was assessed by predicting the health risks in terms of excess cancer and non-cancer hazard impacts using the EPA's AERMOD dispersion modeling and guidance published by OEHHA. Based on HRA results detailed in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions,* Alternative 4 would not exceed YSAQMD's non-cancer or cancer health thresholds (see Table 22-107) and, thus, would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to DPM emissions and their health hazards during construction would not be adverse.

***CEQA Conclusion*:** DPM generated during construction poses inhalation-related chronic non-cancer hazard and cancer risk if adjacent receptors are exposed to significant concentrations for prolonged durations. The DPM generated during Alternative 4 construction would not exceed the YSAQMD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial health hazards. Therefore, this impact for DPM emissions would be less than significant. No mitigation is required.

Table 22-107. Alternative 4 Health Hazards from DPM Exposure in the Yolo-Solano Air Quality Management District

Parameter	Chronic Health Hazard	Cancer Health Risk
Maximum Value	0.0003	1 per million
YSAQMD Thresholds	*1*	*10 per million*

Source: Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*

Note: Emissions would not be generated in Yolo County. However, emissions from the adjacent Sacramento County could affect sensitive receptors in Yolo County.

Impact AQ-16: Exposure of Sensitive Receptors to Health Hazards from Diesel Particulate Matter in Excess of BAAQMD's Chronic Non-Cancer and Cancer Risk Thresholds

NEPA Effects: As shown in Table 22-99, construction would result in an increase of DPM emissions in the BAAQMD, particularly near sites involving the greatest duration and intensity of construction activities. DPM poses inhalation-related chronic non-cancer hazard and cancer risks if adjacent receptors are exposed to significant DPM concentrations for prolonged durations.

Receptor exposure to construction DPM emissions was assessed by predicting the health risks in terms of excess cancer and non-cancer hazard impacts using the EPA's AERMOD dispersion modeling and guidance published by OEHHA. Based on the HRA results detailed in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, Alternative 4 would not exceed the BAAQMD's chronic non-cancer or cancer thresholds (see Table 22-108) and, thus, would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to DPM emissions and their health hazards during construction would not be adverse.

***CEQA Conclusion*:** DPM generated during construction poses inhalation-related chronic non-cancer hazard and cancer risk if adjacent receptors are exposed to significant concentrations for prolonged durations. The DPM generated during Alternative 4 construction would not exceed the BAAQMD's chronic non-cancer or cancer thresholds. Therefore, this impact for DPM emissions would be less than significant. No mitigation is required.

Table 22-108. Alternative 4 Health Hazards from DPM Exposure in the Bay Area Air Quality Management District

Parameter	Chronic Health Hazard	Cancer Health Risk
Maximum Value	0.001	5 per million
BAAQMD Thresholds	*1*	*10 per million*
Source: Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*.		

Impact AQ-17: Exposure of Sensitive Receptors to Health Hazards from Diesel Particulate Matter in Excess of SJVAPCD's Chronic Non-Cancer and Cancer Risk Thresholds

NEPA Effects: As shown in Table 22-99, construction would result in an increase of DPM emissions in the Study area, particularly near sites involving the greatest duration and intensity of equipment. DPM poses inhalation-related chronic non-cancer hazard and cancer risks if adjacent receptors are exposed to significant DPM concentrations for prolonged durations.

Receptor exposure to construction DPM emissions was assessed by predicting the health risks in terms of excess cancer and non-cancer hazard impacts using the EPA's AERMOD dispersion modeling and guidance published by OEHHA. Based on HRA results detailed in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, Alternative 4 would not exceed the SJVAPCD's chronic non-cancer or cancer thresholds (Table 22-109) and, thus, would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to DPM emissions and their health hazards during construction would not be adverse.

***CEQA Conclusion*:** DPM generated during construction poses inhalation-related chronic non-cancer hazard and cancer risk if adjacent receptors are exposed to significant concentrations for prolonged durations. The DPM generated during Alternative 4 construction would not exceed the SJVAPCD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this impact for DPM emissions would be less than significant. No mitigation is required.

Table 22-109. Alternative 4 Health Hazards in the San Joaquin Valley Air Pollution Control District

Parameter	Chronic Health Hazard	Cancer Health Risk
Maximum Value	0.0008	3 per million
SJVAPCD Thresholds	*1*	*10 per million*
Source: Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*.		

Impact AQ-18: Exposure of Sensitive Receptors to *Coccidioides immitis* (Valley Fever)

***NEPA Effects*:** Disturbance of soil containing *C. immitis* could expose the receptors adjacent to the construction site to spores known to cause Valley Fever. Areas endemic to *C. immitis* are generally arid to semiarid with low annual rainfall, and as such, soil containing the fungus is commonly found in Southern California and throughout the Central Valley. Table 22-22 summarizes Valley Fever hospitalization rates between 2002 and 2010 in affected California counties and indicates that over

60% of Valley Fever cases have been in people who live in the San Joaquin Valley. Within the Plan Area, San Joaquin County has the highest hospitalization rate due to Valley Fever and is the 8th most affected county in the State. By comparison, hospitalization rates in Sacramento and Contra Costa counties are relatively low.

The presence of *C. immitis* in the Plan Area does not guarantee that CM1 construction activities would result in increased incidence of Valley Fever. Propagation of *C. immitis* is dependent on climatic conditions, with the potential for growth and surface exposure highest following early seasonal rains and long dry spells. *C. immitis* spores can be released when filaments are disturbed by earthmoving activities, although receptors must be exposed to and inhale the spores to be at increased risk of developing Valley Fever. Moreover, exposure to *C. immitis* does not guarantee that an individual will become ill—approximately 60 percent of people exposed to the fungal spores are asymptomatic and show no signs of an infection (United States Geological Survey 2000).

While there are a number of factors that influence receptor exposure and development of Valley Fever, earthmoving activities during construction could release *C. immitis* spores if filaments are present and other soil chemistry and climatic conditions are conducive to spore development. Receptors adjacent to the construction area may therefore be exposed to increase risk of inhaling *C. immitis* spores and subsequent development of Valley Fever. Dust-control measures are the primary defense against infection (United States Geological Survey 2000). Implementation of advanced air-district recommended fugitive dust controls outlined in Appendix 3B, *Environmental Commitments*, would avoid dusty conditions and reduce the risk of contracting Valley Fever through routine watering and other controls. Therefore, this alternative's effect of exposure of sensitive receptors to increased Valley Fever risk during construction would not be adverse.

***CEQA Conclusion*:** Construction of the water conveyance facility would involve earthmoving activities that could release *C. immitis* spores if filaments are present and other soil chemistry and climatic conditions are conducive to spore development. Receptors adjacent to the construction area may therefore be exposed to increase risk of inhaling *C. immitis* spores and subsequent development of Valley Fever. Implementation of air-district recommended fugitive dust controls outlined in Appendix 3B, *Environmental Commitments*, would avoid dusty conditions and reduce the risk of contracting Valley Fever through routine watering and other controls. Therefore, this impact would be less than significant. No mitigation is required.

Impact AQ-19: Creation of Potential Odors Affecting a Substantial Number of People during Construction or Operation of the Proposed Water Conveyance Facility

NEPA Effects: The generation and severity of odors is dependent on a number of factors, including the nature, frequency, and intensity of the source; wind direction; and the location of the receptor(s). Odors rarely cause physical harm, but can cause discomfort, leading to complaints to regulatory agencies.

Sources of odor during construction include diesel exhaust from construction equipment, asphalt paving, and excavated organic matter from the removal of RTM and sediment. All air districts in the Plan Area have adopted rules that limits the amount of ROG emissions from cutback asphalt (see Section 22.2.3). Accordingly, potential odors generated during asphalt paving would be addressed through mandatory compliance with air district rules (YSAQMD Rule 2.28, SMAQMD Rule 453, BAAQMD Regulation 8, Rule 15, SJVAPCD Rule 4641). Odors from equipment exhaust would be localized and generally confined to the immediate area surrounding the construction site. These odors would be temporary and localized, and they would cease once construction activities have

been completed. Thus, it is not anticipated that construction of CM1 would create objectionable odors from construction equipment or asphalt paving.

Construction of the water conveyance facility would require removal of subsurface material during tunnel excavation and sediment removal. Approximately 27 million cubic yards of saturated tunnel RTM would result from tunnel boring activities. If present in the RTM and sediment, anaerobic decay of organic material can generate gases, specifically hydrogen sulfide. Hydrogen sulfide is commonly described as having a foul or "rotten egg" smell (Occupational Safety and Health Administration 2005).

Geotechnical tests indicate that soils in the Plan Area have a high moisture content generally ranging about 38 to 41 percent. Testing shows that soils in the Plan Area are predominately comprised of silt and clay, with a variety of inorganic materials that are not anticipated to result in malodors. The majority of test results for organic constituents and VOC were below the method detection limits, indicating that organic decay of exposed RTM and sediment will be relatively low (URS 2014). Moreover, drying and stockpiling of the removed RTM and sediment will occur under aerobic conditions, which will further limit any potential decomposition and associated malodorous products. Accordingly, it is not anticipated that tunnel and sediment excavation would create objectionable odors.

Typical facilities known to produce odors include landfills, wastewater treatment plants, food processing facilities, and certain agricultural activities. Alternative 4 would not result in the addition of facilities associated with odors, and as such, long-term operation of the water conveyance facility would not result in objectionable odors.

CEQA Conclusion**:** Alternative 4 would not result in the addition of major odor producing facilities. Diesel emissions during construction could generate temporary odors, but these would quickly dissipate and cease once construction is completed. Likewise, potential odors generated during asphalt paving would be addressed through mandatory compliance with air district rules and regulations. While tunnel excavation would unearth approximately 27 million cubic yards of RTM, geotechnical tests indicate that soils in the Plan Area have relatively low organic constituents. Moreover, drying and stockpiling of the removed RTM will occur under aerobic conditions, which will further limit any potential decomposition and associated malodorous products. Accordingly, the impact of exposure of sensitive receptors to potential odors would be less than significant. No mitigation is required.

Impact AQ-20: Generation of Criteria Pollutants in the Excess of Federal *De Minimis* Thresholds from Construction and Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: EPA's General Conformity Rule (40 CFR Parts 51 and 93) only applies to Federal actions that are taken in EPA-designated "nonattainment" or "maintenance" areas. Accordingly, as outlined in Section III.A of the General Conformity Rule, "only actions which cause emissions in designated nonattainment and maintenance areas are subject to the regulations". Criteria pollutant emissions resulting from construction and operation of Alternative 4 in the SFNA, SJVAB, and SFBAAB are presented in Table 22-110. Exceedances of the federal *de minimis* thresholds are shown in <u>underlined</u> text.

Sacramento Federal Nonattainment Area

As shown in Table 22-110, implementation of Alternative 4 would exceed the following SFNA federal *de minimis* thresholds:

- NO_X: 2019–2027

NO_X is a precursor to ozone and PM and NO_X is a precursor to PM, for which the SFNA is in nonattainment for the NAAQS. Since project emissions exceed the federal *de minimis* threshold for NO_X, a general conformity determination must be made to demonstrate that total direct and indirect emissions of NO_X would conform to the appropriate SFNA SIPs for each year of construction in which the *de minimis* thresholds are exceeded.

NO_X is also a precursor to PM and can contribute to PM formation. As discussed above, Sacramento County is currently designated maintenance for the PM10 NAAQS and portions of the SVAB are designated nonattainment for the PM2.5 NAAQS. NO_X emissions in excess of 100 tons per year in Sacramento County trigger a secondary PM10 precursor threshold, whereas NO_X emissions in excess of 100 tons per year in the SVAB trigger a secondary PM2.5 precursor threshold. Since NO_X emissions can contribute to PM formation, NO_X emissions in excess of these secondary precursor thresholds could conflict with the applicable PM10 and PM2.5 SIPs. Accordingly, NO_X offsets pursued for the purposes of general conformity for those years in which NO_X emissions exceed 100 tons must occur within the federally designated PM2.5 nonattainment and PM10 maintenance areas of the SVAB.

As shown in Table 22-99, NO_X emissions generated by construction activities in SMAQMD (Sacramento County) would not exceed 100 tons per year. Accordingly, the project does not trigger the secondary PM10 precursor threshold. As shown in Table 22-110, NO_X emissions in 2025 would exceed 100 tons year in the SFNA. The project therefore triggers the secondary PM2.5 precursor threshold, requiring all NO_X offsets for 2025 to occur within the federally designated PM2.5 nonattainment area within the SFNA. The nonattainment boundary for PM2.5 includes all of Sacramento County and portions of Yolo, El Dorado, Solano, and Placer counties.

A general conformity determination has been prepared for Alternative 4 and is included in Appendix 22E, *General Conformity Determination*. As shown in Appendix 22E, the federal lead agencies (Reclamation, USFWS, and NMFS) demonstrate that project emissions would not result in a net increase in regional NO_X emissions, as construction-related NO_X would be fully offset to zero through implementation of Mitigation Measures AQ-1a and 1b, which require additional onsite mitigation and/or offsets. Mitigation Measures AQ-1a and 1b will ensure the requirements of the mitigation and offset program are implemented and conformity requirements for NO_X are met.

Mitigation Measure AQ-1a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-1a under Impact AQ-1 in the discussion of Alternative 4.

Mitigation Measure AQ-1b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis*

Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-1b under Impact AQ-1 in the discussion of Alternative 4.

Table 22-110. Criteria Pollutant Emissions from Construction and Operation of Alternative 4 in Nonattainment and Maintenance Areas of the SFNA, SJVAB, and SFBAAB (tons/year)

	Sacramento Federal Nonattainment Area					
Year	ROG	NO_X[a]	CO[b]	PM10[c]	PM2.5	SO_2
2016	<1	3	<1	<1	<1	<1
2017	<1	4	<1	1	1	<1
2018	1	9	1	9	3	<1
2019	5	45	1	21	5	<1
2020	6	64	1	30	5	<1
2021	10	87	3	40	7	<1
2022	11	82	3	40	7	1
2023	10	73	2	38	6	<1
2024	11	83	3	36	7	1
2025	14	106[d]	6	41	8	1
2026	13	90	1	34	6	1
2027	11	79	<1	33	6	<1
2028	3	20	<1	19	3	<1
2029	3	19	<1	13	2	<1
ELT	0.13	0.80	1.65	0.27	0.08	<0.01
LLT	0.11	0.68	1.58	0.26	0.07	<0.01
De Minimis	*25*	*25*	*100*	*100*	*100*	*100*
	San Joaquin Valley Air Basin					
Year	ROG	NO_X[a]	CO[b]	PM10	PM2.5	SO_2
2016	<1	4	0	<1	<1	<1
2017	1	5	0	1	1	<1
2018	3	20	0	9	3	<1
2019	6	42	0	27	5	<1
2020	12	95	4	48	7	2
2021	14	104	7	47	7	3
2022	16	112	13	47	8	6
2023	14	92	13	35	6	6
2024	12	74	13	24	5	6
2025	10	62	8	19	4	4
2026	6	39	0	15	2	<1
2027	4	27	0	14	2	<1
2028	2	10	0	7	1	<1
2029	0	0	0	0	0	0
ELT	0.01	0.08	0.14	0.02	0.01	0.00
LLT	0.01	0.07	0.13	0.02	0.01	0.00
De Minimis	*10*	*10*	*100*	*100*	*100*	*100*

Year	San Francisco Bay Area Air Basin					
	ROG	NO_X[a]	CO[b]	PM10[e]	PM2.5	SO_2
2016	<1	1	<1	-	<1	<1
2017	<1	1	<1	-	<1	<1
2018	3	20	1	-	2	<1
2019	2	19	0	-	2	<1
2020	5	46	17	-	5	7
2021	8	72	31	-	7	12
2022	10	98	49	-	9	19
2023	10	99	49	-	9	19
2024	15	129	49	-	11	20
2025	19	148	32	-	11	13
2026	10	67	2	-	6	1
2027	9	58	2	-	6	1
2028	6	40	1	-	4	1
2029	<1	1	<1	-	1	<1
ELT	0.19	1.15	2.42	-	0.11	0.01
LLT	0.16	0.97	2.33	-	0.10	0.01
De Minimis	*100*	*100*	*100*	-	*100*	*100*

[a] NO_X emissions in excess of 100 tons per year within federally designated PM10 and PM2.5 nonattainment or maintenance areas trigger a secondary PM10 and PM2.5 precursor threshold. NO_X emissions in excess of this secondary threshold could conflict with the applicable PM10 and PM2.5 SIPs. Accordingly, NO_X offsets pursued for the purposes of general conformity for those years in which NO_X emissions exceed 100 tons must occur within the federally designated PM2.5 nonattainment and PM10 maintenance areas, as applicable.

[b] The proposed water conveyance facility is located within a federally designated CO attainment area. Accordingly, CO emissions generated by construction of CM1 are not subject to the General Conformity Rule and are excluded from the emissions summary and general conformity analysis (40 CFR Part 51 and 93, Section III.A). Emissions presented in the table are limited those generated by haul trucks, which would occur in federally designated CO maintenance area.

[c] There are no federally designated PM10 maintenance areas in Yolo County. Accordingly, PM10 emissions generated by construction of CM1 in Yolo County are not subject to the General Conformity Rule and are excluded from the emissions summary and general conformity analysis for the SFNA (40 CFR Part 51 and 93, Section III.A). Emissions presented in the table are limited those generated within Sacramento County.

[d] 96.2 tons would be generated in SMAQMD and 9.7 tons would be generated in YSAQMD (see Table 22-99).

[e] There are no federally designated PM10 nonattainment or maintenance areas in the SFBAAB. Accordingly, PM10 emissions generated by construction of CM1 are not subject to the General Conformity Rule and are excluded from the emissions summary and general conformity analysis (40 CFR Part 51 and 93, Section III.A).

San Joaquin Valley Air Basin

As shown in Table 22-110, implementation of Alternative 4 would exceed the following SJVAB federal *de minimis* thresholds:

- ROG: 2020–2025

- NO_X: 2018–2028

ROG and NO_X are precursors to ozone and NO_X is a precursor to PM, for which the SJVAB is in nonattainment for the NAAQS. Since project emissions exceed the federal *de minimis* threshold for ROG and NO_X, a general conformity determination must be made to demonstrate that total direct and indirect emissions of ROG and NO_X would conform to the appropriate SJVAB SIP for each year of construction in which the *de minimis* thresholds are exceeded.

NO_X is also a precursor to PM and can contribute to PM formation. As discussed above, the SJVAB is currently designated maintenance for the PM10 NAAQS and nonattainment for the PM2.5 NAAQS. NO_X emissions in excess of 100 tons per year trigger a secondary PM precursor threshold, and could conflict with the applicable PM10 and PM2.5 SIPs. As shown in Table 22-110, NO_X emissions generated by construction activities in the SJVAB would exceed 100 tons per year between 2021 and 2022. NO_X offsets pursued for the purposes of general conformity for those years in which NO_X emissions exceed 100 tons must occur within the federally designated PM2.5 nonattainment and PM10 maintenance areas of the SJVAB, which are consistent with the larger nonattainment boundary for ozone.

A general conformity determination has been prepared for Alternative 4/4A and is included in Appendix 22E, *General Conformity Determination.* As shown in Appendix 22E, the federal lead agencies (Reclamation, USFWS, and NMFS) demonstrate that project emissions would not result in an increase in regional ROG or NO_X emissions, as construction-related ROG and NO_X emissions would be fully offset to zero through implementation of Mitigation Measures AQ-4a and AQ-4b, which require additional onsite mitigation and/or offsets. Mitigation Measures AQ-4a and AQ-4b will ensure the requirements of the mitigation and offset program are implemented and conformity requirements for ROG and NO_X are met.

Mitigation Measure AQ-4a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4a under Impact AQ-4 in the discussion of Alternative 4.

Mitigation Measure AQ-4b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4b under Impact AQ-4 in the discussion of Alternative 4.

San Francisco Bay Area Air Basin

As shown in Table 22-110, implementation of Alternative 4 would exceed the following SFBAAB federal *de minimis* thresholds:

- NO_X: 2024–2025

NO_X is a precursor to ozone and PM, for which the SFBAAB is in nonattainment for the NAAQS. Since project emissions exceed the federal *de minimis* thresholds for NO_X, a general conformity determination must be made to demonstrate that total direct and indirect emissions of NO_X would conform to the appropriate SFBAAB SIP for each year of construction in which the *de minimis* thresholds are exceeded.

A general conformity determination has been prepared for Alternative 4/4A and is included in Appendix 22E, *General Conformity Determination.* As shown in Appendix 22E, the federal lead agencies (Reclamation, USFWS, and NMFS) demonstrate that project emissions would not result in a net increase in regional NO_X0 emissions, as construction-related NO_X would be fully offset to zero through implementation of Mitigation Measures AQ-3a and 3b, which require additional onsite mitigation and/or offsets. Mitigation Measures AQ-3a and 3b will ensure the requirements of the mitigation and offset program are implemented and conformity requirements for NO_X are met.

Mitigation Measure AQ-3a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within BAAQMD/SFBAAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable BAAQMD CEQA Thresholds for Other Pollutants[48]

Please refer to Mitigation Measure AQ-3a under Impact AQ-3 in the discussion of Alternative 4.

Mitigation Measure AQ-3b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the BAAQMD/SFBAAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable BAAQMD CEQA Thresholds for Other Pollutants

Please refer to Mitigation Measure AQ-3b under Impact AQ-3 in the discussion of Alternative 4.

CEQA Conclusion: SFNA, SJVAB, and SFBAAB are classified as nonattainment areas with regard to the ozone NAAQS and the impact of increases in criteria pollutant emissions above the air basin *de minimis* thresholds could conflict with or obstruct implementation of the applicable air quality plans. Since construction emissions in the SFNA, SJVAB, and SFBAAB would exceed the *de minimis* thresholds for ROG (SJVAB only) and NO_X, this impact would be significant. Mitigation Measures AQ-1a, AQ-1b, AQ-3a, AQ-3b, AQ-4a, and AQ-4b would ensure project emissions would not result in an increase in regional ROG (SJVAB only) or NO_X emissions. These measures would therefore ensure total direct and indirect ROG (SJVAB only) and NO_X emissions generated by the project would conform to the appropriate air basin SIPs by offsetting the action's emissions in the same or nearby area to net zero.

Impact AQ-21: Generation of Cumulative Greenhouse Gas Emissions during Construction of the Proposed Water Conveyance Facility

NEPA Effects: GHG (CO_2, CH_4, N_2O, SF_6, and HFCs) emissions resulting from construction of Alternative 4 are presented in Table 22-111. Emissions with are presented with implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*) and state mandates to reduce GHG emissions. State mandates include the RPS, LCFS, and Pavley. These mandates do not

[48] In the title of this mitigation measure, the phrase "for other pollutants" is intended to apply to other alternatives, where associated impacts to other pollutants may exceed thresholds other than NO_X.

require additional action on the part of DWR, but will contribute to GHG emissions reductions. For example, Pavley and LCFS will improve the fuel efficiency of vehicles and reduce the carbon content of transportation fuels, respectively. Equipment used to construct the project will therefore be cleaner and less GHG intensive than if the state mandates had not been established. Due to the global nature of GHGs, the determination of effects is based on total emissions generated by construction (Table 22-111).

Table 22-111. GHG Emissions from Construction of Alternative 4 (metric tons/year)[a]

Year	Equipment and Vehicles (CO_2e)	Electricity (CO_2e)	Concrete Batching (CO_2)	Total CO_2e
2016	2,014	0	0	2,014
2017	2,694	0	0	2,694
2018	19,097	1,265	1,173	21,535
2019	37,147	4,602	43,117	84,866
2020	63,992	26,387	82,627	173,006
2021	95,552	69,249	184,947	349,748
2022	109,560	96,611	352,630	558,800
2023	102,228	85,979	330,407	518,614
2024	111,807	89,036	316,078	516,921
2025	123,701	60,880	284,149	468,731
2026	69,941	22,431	31,677	124,049
2027	56,504	5,083	74,130	135,717
2028	29,548	1,007	20,646	51,202
2029	8,014	5	3,497	11,516
Total	*831,799*	*462,535*	*1,725,078*	*3,019,413*

[a] Emissions estimates do not account for GHG flux from land disturbance. Surface and subsurface (e.g., tunneling) activities may oxidize peat soils, releasing GHG emissions. However, recent geotechnical surveys indicated that peat is negligible below 80 feet of depth. The tunnel will be placed below this range and the design adjusted if peat soils are discovered. Peat material encountered during surface excavation for non-tunnel work will be covered with top soil to reduce oxidation when needed.

Values may not total correctly due to rounding.

Table 22-112 summarizes GHG emissions that would be generated in the BAAQMD, SMAQMD, SJVAPCD, and YSAQMD. The table does not include emissions from electricity generation as these emissions would be generated by power plants located throughout the state (see discussion preceding this impact analysis). GHG emissions presented in Table 22-112 are therefore provided for information purposes only.

Table 22-112. GHG Emissions from Construction of Alternative 4 by Air District (metric tons/year)[a]

Air District	Equipment and Vehicles (CO_2e)	Concrete Batching (CO_2)[a]	Total CO_2e[b]
SMAQMD	257,364	152,657	410,022
YSAQMD	21,964	0	21,964
SJVAPCD	243,958	486,857	730,815
BAAQMD	308,513	1,085,564	1,394,077

[a] Emissions assigned to each air district based on the number of batching plants located in that air district.
[b] Values may not total correctly due to rounding.

Construction of Alternative 4 would generate a total of 3.0 million metric tons of GHG emissions after implementation of environmental commitments and state mandates. This is equivalent to adding 633,000 typical passenger vehicles to the road during construction (U.S. Environmental Protection Agency 2014e). As discussed in section 22.3.2, *Determination of Effects*, any increase in emissions above net zero associated with construction of the BDCP water conveyance features would be adverse. Accordingly, this effect would be adverse. Mitigation Measure AQ-21, which would develop a GHG Mitigation Program to reduce construction-related GHG emissions to net zero, is available address this effect. Please refer to Appendix 22A, *Air Quality Analysis Methodology*, for a summary of assumptions used to estimate potential GHG reductions associated with each strategy.

CEQA Conclusion: Construction of Alternative 4 would generate a total of 3.0 million metric tons of GHG emissions. This is equivalent to adding 633,000 typical passenger vehicles to the road during construction (U.S. Environmental Protection Agency 2014e). As discussed in section 22.3.2, *Determination of Effects*, any increase in emissions above net zero associated with construction of the BDCP water conveyance features would be significant. Mitigation Measure AQ-21 would develop a GHG Mitigation Program to reduce construction-related GHG emissions to net zero. Accordingly, this impact would be less-than-significant with implementation of Mitigation Measure AQ-21.

Mitigation Measure AQ-21: Develop and Implement a GHG Mitigation Program to Reduce Construction Related GHG Emissions to Net Zero (0)

BDCP proponents will develop a GHG Mitigation Program prior to the commencement of any construction or other physical activities associated with CM1 that would generate GHG emissions. The GHG Mitigation Program will consist of feasible options that, taken together, will reduce construction-related GHG emissions to net zero (0) (i.e., emissions will be reduced to the maximum extent feasible and any remaining emissions from the project will be offset elsewhere by emissions reductions of equal amount). The BDCP proponents will determine the nature and form of the components of the GHG Mitigation Program after consultation with the following agencies, as applicable: (i) Study area air districts (BAAQMD, SMAQMD, SJVPACD, and YSAQMD), (ii) California Air Resources Board, (iii) U.S. Environmental Protection Agency, and (iv) California Energy Commission.

Specific strategies that could be used in formulating the GHG Mitigation Program are summarized below. The identified strategies will produce GHG reductions across a broad range of emissions sectors throughout the state. The strategies are divided into seven categories based on their application. Potential GHG emissions reductions that could be achieved by each measure are identified. It is theoretically possible that many of the strategies discussed below could independently achieve a net-zero GHG footprint for BDCP construction activities. Various combinations of measure strategies could also be pursued to optimize total costs or community co-benefits. The BDCP proponents shall be responsible for determining the overall mix of strategies necessary to ensure the performance standard to mitigate the adverse GHG construction impacts is met.

BDCP proponents will develop a mechanism for quantifying, funding, implementing, and verifying emissions reductions associated with the selected strategies. BDCP proponents will also conduct annual reporting to verify and document that selected strategies achieve sufficient emissions reductions to offset construction-related emissions to net zero. All selected strategies must be quantifiable, verifiable, enforceable, and satisfy the basic criterion of additionally (i.e., the reductions would not happen without the financial support of purchased offset credits or other mitigation strategies). Annual reports will include, at a minimum the following components.

- Calculated or measured emissions from construction activities over the reporting year.
- Projects selected for funding during the reporting year.
- Total funds distributed to selected projects during the reporting year.
- Cumulative funds distributed since program inception.
- Emissions reductions achieved during the reporting year.
- Cumulative reductions since program inception.
- Total emissions reductions remaining to satisfy the requirements of Mitigation Measure AQ-21.

GHG Emissions Reduction Strategies to Consider in Formulating a GHG Mitigation Program

This section summarizes GHG reduction strategies that will be considered in formulating a GHG mitigation program. Quantitative information on the potential capacity of each strategy is provided in Appendix 22A, *Air Quality Analysis Methods*. These estimates are based on general construction activity information, the size and trading volume of existing carbon offset markets, and available alternative energy resources (e.g., biomass, renewable energy) available to the project as potential mitigation strategies. Emissions reductions quantified for each strategy should be seen as high-level screening values that illustrate a rough order of magnitude for the expected level of emissions reductions or offsets. Moreover, the mitigation strategies should be viewed not as individual strategies, but rather as a suite of strategies. If one strategy, when investigated in greater detail prior to implementation, cannot deliver as high a level of emissions reduction or offset as initially estimated, other strategies will be implemented to ensure achievement of the performance standard of zero net GHG emissions from the project.

Renewable Energy Purchase Agreement

- **Strategy-1: Renewable Energy Purchase Agreement:** Enter into a power purchase agreement, where feasible, with utilities which provide electricity service within the Study area to purchase construction electricity from renewable sources. Renewable sources must be zero emissions energy sources (e.g., wind, solar, hydro) and may not be accounted to utility RPS goals.

Additional Onsite Mitigation

- **Strategy-2: Engine Electrification**: DWR has identified all feasible electrification requirements as environmental commitments. It is anticipated that additional technology will be available by the time construction starts that will enable further electrification. This strategy would take advantage of new technologies as they become available and will engage the maximum level of engine electrification feasible for onsite heavy-duty equipment.
- **Strategy-3: Low Carbon Concrete**: Require concrete components to be constructed out of concrete with up to 70% replacement of cement with SCM with lower embodied energy and associated GHG emissions.[49] Implementation of this strategy would require structural testing to ensure the concrete meet required strategy strength, durability, workability, and rigidity standards. If new materials with lower embodied energy or superior workability are developed between the writing of this measure and project commencement, the BDCP proponents will investigate use of those materials in place of SCM.
- **Strategy-4: Renewable Diesel and/or Bio-diesel:** Require use of renewable diesel sometimes also called "green diesel" and or bio-diesel fuels for operation of all diesel equipment. If new technologies or fuels with lower emissions rates are developed between the writing of this measure and project commencement, those advanced technologies or fuels could be incorporated into this measure.

Energy Efficiency Retrofits and Rooftop Renewable Energy

- **Strategy-5: Residential Energy Efficiency Improvements**: Develop a residential energy retrofit package in conjunction with local utility providers to achieve reductions in natural gas and electricity usage. The retrofit package should include, at a minimum, the following improvements.
  - Replacement of interior high use incandescent lamps with CFLs or LED.
  - Installation of programmable thermostats.
  - Replacement of windows with double-pane or triple-pane solar-control low-E argon gas filled wood frame windows.
  - Identification and sealing of dust and air leaks.
  - Replacement of electric clothes dryers with natural gas dryers.
  - Replacement of natural gas furnaces with Energy Star labeled models.
  - Installation of insulation.

  This measure is inherently scalable (i.e., the total number of houses retrofit is likely limited by funds rather than the availability of housing stock).

[49] SCM are often incorporated in concrete mix to reduce cement contents, improve workability, increase strength, and enhance durability. Although SCM can improve the strength of resulting structures, proper testing is required ensure the cement meets technical specifications for strength and rigidity.

- **Strategy-6: Commercial Energy Efficiency Improvements**: Develop a commercial energy retrocommissioning package in conjunction with local utility providers to improve building-wide energy efficiency by at least 15%, relative to current energy consumption levels. This measure is inherently scalable.
- **Strategy-7: Residential Rooftop Solar**: Develop a residential rooftop solar installation program in conjunction with local utility providers. The installation program will allow homeowners to install solar photovoltaic systems at zero or minimal up-front cost. All projects installed under this measure must be designed for high performance (e.g., optimal full-sun location, solar orientation) and additive to utility RPS goals. This measure is inherently scalable.
- **Strategy-8: Commercial Rooftop Solar**: Develop a commercial rooftop solar installation program in conjunction with local utility providers. The installation program will allow business owners to install solar photovoltaic systems at zero or minimal up-front cost. All projects installed under this measure must be designed for high performance (e.g., optimal full-sun location, solar orientation) and additive to utility RPS goals. This measure is inherently scalable.

Carbon Offsets

- **Strategy-9: Purchase Carbon Offsets**: In partnership with offset providers, purchase carbon offsets. Offset protocols and validation could tier off existing standards (e.g., Climate Registry Programs) or could be developed independently, provided such protocols satisfy basic criterion of additionally (i.e., the reductions would not happen without the financial support of purchased offset credits). ARB has established a Cap and Trade registry that identifies qualified providers and AB 32 projects. It is estimated that between 2012 and 2020, 2.5 billion allowances will be made available within the state (Legislative Analyst's Office 2012). The national and international carbon markets are likely greater. Potential offset programs could include the following.
    - AB 32 U.S. Forest and Urban Forest Project Resources
    - AB 32 Livestock Projects
    - AB 32 Ozone Depleting Substances Projects
    - AB 32 Urban Forest Projects
    - Other-California Based Offsets
    - United States Based Offsets
    - International Offsets (e.g., clean development mechanisms)

    This measure is inherently scalable based on the volume of offsets purchased.

Biomass Digestion and Conversion

- **Strategy-10: Development of Biomass Waste Digestion and Conversion Facilities**: Provide financing for facility development either through long term power purchase agreements or up front project financing. Projects will be awarded based on competitive bidding process and chosen for GHG sequestration and other environmental benefits to project area. Projects will provide a range of final products: electricity generation, Compressed Natural Gas for transportation fuels, and pipeline quality biomethane.

- **Strategy-11: Agriculture Waste Conversion Development:** Fund the re-commissioning of thermal chemical conversion facilities to process collected agricultural biomass residues**.** Project funding will include better resource modeling and provide incentives to farmers in the project area to deliver agricultural wastes to existing facilities.

Increase Renewable Energy Purchases to Operate the State Water Project

- **Strategy-12: Temporarily Increase Renewable Energy Purchases for Operations**: Temporarily increase renewable energy purchases under the Renewable Energy Procurement Plan to offset BDCP construction emissions. DWR as part of its CAP is implementing a Renewable Energy Procurement Plan. This plan identifies the quantity of additional renewable electricity resources that DWR will purchase in each year between 2010 and 2050 to achieve the GHG emissions reduction goals laid out in the CAP.

Land Use Change and Sequestration

- ***Strategy-13: Tidal Wetland Inundation*****:** Expand the number of subsidence reversal and/or carbon sequestration projects currently being undertaken by DWR on Sherman and Twitchell Islands. Existing research at the Twitchell Wetlands Research Facility demonstrates that wetland restoration can sequester 25 tons of carbon per acre per year. Measure funding could be used to finance permanent wetlands for waterfowl or rice cultivation, creating co-benefits for wildlife and local farmers.

Impact AQ-22: Generation of Cumulative Greenhouse Gas Emissions from Operation and Maintenance of the Proposed Water Conveyance Facility and Increased Pumping

NEPA Effects: Operation of Alternative 4 would generate direct and indirect GHG emissions. Sources of direct emissions include heavy-duty equipment, on road crew trucks, and employee vehicle traffic. Indirect emissions would be generated predominantly by electricity consumption required for pumping as well as, maintenance, lighting, and other activities.

Table 22-113 summarizes long-term operational GHG emissions associated with operations, maintenance, and increased SWP pumping. Emissions were quantified for both ELT and LLT conditions, although activities would take place annually until project decommissioning. Emissions include state mandates to reduce GHG emissions (described in Impact AQ-21) are presented (there are no BDCP specific operational environmental commitments). Total CO_2e emissions are compared to both the No Action Alternative (NEPA point of comparison) and Existing Conditions (CEQA baseline). As discussed in Section 22.3.1.2, equipment emissions are assumed to be zero under both the No Action Alternative (NEPA point of comparison) and Existing Conditions (CEQA baseline). The equipment emissions presented in Table 22-113 are therefore representative of project impacts for both the NEPA and CEQA analysis.

Table 22-113. GHG Emissions from Operation, Maintenance, and Increased SWP Pumping, Alternative 4 (Scenarios H1 through H4) (metric tons/year)

		NEPA Point of Comparison (Electricity CO_2e)				CEQA Baseline (Electricity CO_2e)				NEPA Point of Comparison (Total CO_2e)				CEQA Baseline (Total CO_2e)			
Condition	Equipment CO_2e	H1	H2	H3	H4	H1	H2	H3	H4	H1	H2	H3	H4	H1	H2	H3	H4
ELT	815	-	-	-	-	112,740	-3,887	51,457	-46,611	-	-	-	-	113,555	-3,071	52,272	-45,796
LLT	791	28,697	11,992	19,086	2,795	7,121	-10,521	-2,489	-22,533	29,488	12,783	19,878	3,586	7,913	-9,730	-1,698	-21,742

Note: The *NEPA point of comparison* compares total CO_2e emissions after implementation of Alternative 4 to the No Action Alternative, whereas the *CEQA baseline* compares total CO_2e emissions to Existing Conditions.

Table 22-114 summarizes equipment CO_2e emissions that would be generated in the BAAQMD, SMAQMD, and SJVAPCD (no operational emissions would be generated in the YSAQMD) under Scenarios H1 through H4. The table does not include emissions from SWP pumping as these emissions would be generated by power plants located throughout the state (see discussion preceding this impact analysis). GHG emissions presented in Table 22-114 are therefore provided for information purposes only.

Table 22-114. Equipment CO_2e Emissions from Operation and Maintenance of Alternative 4 (Scenarios H1 through H4) by Air District (metric tons/year)

Air District	ELT	LLT
SMAQMD	319	311
SJVAPCD	36	36
BAAQMD	460	445
Total	815	791

[a] Emissions do not include emissions generated by increased SWP pumping.

SWP Operational and Maintenance GHG Emissions Analysis

SWP operational emissions with implementation of Alternative 4 would vary depending on the outcome of the decision tree process. Because Scenario H1 represents the largest potential increase in SWP electricity demand (of the four possible outcomes) this analysis evaluates Scenario H1. Note that Scenario H4 would result in a decrease in SWP electricity demand, and thus would result in no impact or a positive impact on SWP operational GHG emissions.

Alternative 4 would add a maximum of 1,405 GWh[50] of additional net electricity demand to operation of the SWP each year assuming 2060 (LLT) conditions. Conditions at 2060 are used for this analysis because they yield the largest potential additional net electricity requirements and therefore represent the largest potential impact. This 1,405 GWh is based on assumptions of future conditions and operations and includes all additional energy required to operate the project with BDCP Alternative 4 including any additional energy associated with additional water being moved through the system.

In the CAP, DWR developed estimates of historical, current, and future GHG emissions. Figure 22-17 shows those emissions as they were projected in the CAP and how those emissions projections would change with the additional electricity demands needed to operate the SWP with the addition of BDCP Alternative 4. As shown in Figure 22-17, in 2024, the year BDCP Alternative 4 is projected to go online, DWR total emissions jump from around 912,000 metric tons of CO_2e to around 1.5 million metric tons of CO_2e. This elevated level is approximately 260,000 metric tons of CO_2e above DWR's designated GHG emissions reduction trajectory (red line, which is the linear interpolation between DWR's 2020 GHG emissions goal and DWR's 2050 GHG emissions goal.) The projection indicates that after the initial jump in emissions, existing GHG emissions reduction measures would

[50] Estimated net energy demand differs slightly from what is presented in Chapter 21, *Energy*. This is because the above analysis includes energy needed for transmission and distribution of water along the Valley String, which is required to enable a comparison with the assumptions in DWR's CAP.

bring the elevated GHG emissions level back down below DWR's GHG emissions reduction trajectory by 2041 and that DWR would still achieve its GHG emission reduction goal by 2050.

Because employing only DWR's existing GHG emissions reduction measures would result in a large initial increase in emissions and result in DWR emissions exceeding the emissions reduction trajectory for several years, DWR will take additional actions to reduce GHG emissions if BDCP Alternative 4 is implemented.

The CAP sets forth DWR's plan to manage its activities and operations to achieve its GHG emissions reduction goals. The CAP commits DWR to monitoring its emissions each year and evaluating its emissions every five years to determine whether it is on a trajectory to achieve its GHG emissions reduction goals. If it appears that DWR will not meet the GHG emission reduction goals established in the plan, DWR may make adjustments to existing emissions reduction measures, devise new measures to ensure achievement of the goals, or take other action. Given the scale of additional emissions that BDCP Alternative 4 would add to DWR's total GHG emissions, DWR has evaluated the most likely method that it would use to compensate for such an increase in GHG emissions: modification of DWR's REPP. The DWR REPP (GHG emissions reduction measure OP-1 in the CAP) describes the amount of additional renewable energy that DWR expects to purchase each year to meet its GHG emissions reduction goals. The REPP lays out a long-term strategy for renewable energy purchases, though actual purchases of renewable energy may not exactly follow the schedule in the REPP and will ultimately be governed by actual operations, measured emissions, and contracting.

Table 22-115 below shows how the REPP could be modified to accommodate BDCP Alternative 4, and shows that additional renewable energy resources could be purchased during years 2022–2025 over what was programmed in the original REPP. The net result of this change is that by 2026 DWR's energy portfolio would contain nearly 1,405 GWh of renewable energy (in addition to hydropower generated at SWP facilities). This amount is considerably larger than the amount called for in the original DWR REPP (1,393 compared to 792). In later years, 2031–2050, DWR would bring on slightly fewer additional renewable resources than programmed in the original REPP. Figure 22-18 shows how this modified REPP would affect DWR's projected future emissions with BDCP Alternative 4.

Table 22-115. Changes in Expected Renewable Energy Purchases 2011–2050 (Alternative 4)

	Additional GWh of Renewable Power Purchased (Above previous year)	
Year(s)	Original CAP	New CAP
2011–2020	36	36
2021	72	72
2022–2025	72	222
2026–2030	72	72
2031–2040	108	53
2041–2050	144	74
Total Cumulative	52,236	57,011

As shown in the analysis above and consistent with the analysis contained in the CAP and associated Initial Study and Negative Declaration for the CAP, BDCP Alternative 4 would not adversely affect DWR's ability to achieve the GHG emissions reduction goals set forth in the CAP. Further, Alternative

4 would not conflict with any of DWR's specific action GHG emissions reduction measures and implements all applicable project level GHG emissions reduction measures as set forth in the CAP. BDCP Alternative 4 is therefore consistent with the analysis performed in the CAP. There would be no adverse effect.

CEQA Conclusion: SWP GHG emissions currently are below 1990 levels and achievement of the goals of the CAP means that total DWR GHG emissions will be reduced to 50% of 1990 levels by 2020 and to 80% of 1990 levels by 2050. The implementation of BDCP Alternative 4 would not affect DWR's established emissions reduction goals or baseline (1990) emissions and therefore would not result in a change in total DWR emissions that would be considered significant. Prior adoption of the CAP by DWR already provides a commitment on the part of DWR to make all necessary modifications to DWR's REPP (as described above) or any other GHG emission reduction measure in the CAP that are necessary to achieve DWR's GHG emissions reduction goals. Therefore no amendment to the approved CAP is necessary to ensure the occurrence of the additional GHG emissions reduction activities needed to account for BDCP-related operational emissions. The effect of BDCP Alternative 4 with respect to GHG emissions is less than cumulatively considerable and therefore less than significant. No mitigation is required.

Impact AQ-23: Generation of Cumulative Greenhouse Gas Emissions from Increased CVP Pumping as a Result of Implementation of CM1

NEPA Effects: As previously discussed, DWR's CAP cannot be used to evaluate environmental impacts associated with increased CVP pumping, as emissions associated with CVP are not under DWR's control and are not included in the CAP. Accordingly, GHG emissions resulting from increased CVP energy use are evaluated separately from GHG emissions generated as a result of SWP energy use.

Under Alternative 4, operation of the CVP yields the generation of clean, GHG emissions-free, hydroelectric energy. This electricity is sold into the California electricity market or directly to energy users. Analysis of the No Action Alternative indicates that the CVP generates and will continue to generate all of the electricity needed to operate the CVP system and approximately 3,500 GWh of excess hydroelectric energy that would be sold to energy users throughout California. Implementation of Alternative 4, however, could result in an increase of up to 134[51] GWh in the demand for CVP generated electricity, which would result in a reduction of 134 GWh or electricity available for sale from the CVP to electricity users. This reduction in the supply of GHG emissions-free electricity to the California electricity users could result in a potential indirect effect of the project, as these electricity users would have to acquire substitute electricity supplies that may result in GHG emissions (although additional conservation is also a possible outcome as well).

It is unknown what type of power source (e.g., renewable, natural gas) would be substituted for CVP electricity or if some of the lost power would be made up with higher efficiency. Given State mandates for renewable energy and incentives for energy efficiency, it is possible that a

[51] SWP operational emissions with implementation of Alternative 4 would vary depending on the outcome of the decision tree process. Because Scenario H1 represents the largest potential decrease in excess generating capacity for the CVP (of the four possible outcomes) this analysis evaluates Scenario H1. Note that Scenario H4 would result in an increase in excess CVP generating capacity, and thus would result in no impact or a positive impact on statewide GHG emissions.

considerable amount of this power would be replaced by renewable resources or would cease to be needed as a result of higher efficiency. However, to ensure a conservative analysis, indirect emissions were quantified for the entire quantity of electricity (134 GWh) using the current and future statewide energy mix (adjusted to reflect RPS) (please refer to Appendix 22A, *Air Quality Analysis Methodology* for additional detail on quantification methods).

Substitution of 134 GWh of electricity with a mix of sources similar to the current statewide mix would result in emissions of 37,476 metric tons of CO_2e; however, under expected future conditions (after full implementation of the RPS), emissions would be 29,121 metric tons of CO_2e.

Use of CVP hydroelectricity to meet increased electricity demand from operation of CVP facilities associated with Alternative 4 would reduce available CVP hydroelectricity to other California electricity users. Substitution of the lost electricity with electricity from other sources could indirectly result in an increase of GHG emissions that is comparable or larger than the level of GHG emissions that trigger mandatory GHG reporting for major facilities. As a result, these emissions could contribute to a cumulatively considerable effect and are therefore adverse. However, these emissions would be caused by dozens of independent electricity users, who had previously bought CVP power, making decisions about different ways to substitute for the lost power. These decisions are beyond the control of Reclamation or any of the other BDCP Lead Agencies. Further, monitoring to determine the actual indirect change in emissions as a result of BDCP actions would not be feasible. In light of the impossibility of predicting where any additional emissions would occur, as well as Reclamation's lack of regulatory authority over the purchasers of power in the open market, no workable mitigation is available or feasible.

***CEQA Conclusion*:** Operation of the CVP is a federal activity beyond the control of any State agency such as DWR, and the power purchases by private entities or public utilities in the private marketplace necessitated by a reduction in available CVP-generated hydroelectric power are beyond the control of the State, just as they are beyond the control of Reclamation. For these reasons, there are no feasible mitigation measures that could reduce this potentially significant indirect impact, which is solely attributable to operations of the CVP and not the SWP, to a less than significant level. This impact is therefore determined to be significant and unavoidable.

Impact AQ-24: Generation of Regional Criteria Pollutants from Implementation of CM2–CM11

NEPA Effects: Implementation of the CM2–CM11 could generate additional traffic on roads and highways in and around Suisun Marsh and the Yolo Bypass related to restoration or monitoring activities. Habitat restoration and enhancement activities that require physical changes or heavy-duty equipment would generate construction emissions through earthmoving activities and heavy-duty diesel-powered equipment. Habitat restoration and enhancement conservation measures are anticipated to include a number of activities generating traffic to transport material and workers to and from the construction sites, including the following.

- Grading, excavating, and placing fill material.
- Breaching, modifying, or removing existing levees and constructing new levees.
- Modifying, demolishing, and removing existing infrastructure (e.g., buildings, roads, fences, electric transmission and gas lines, irrigation infrastructure).
- Constructing new infrastructure (e.g., buildings, roads, fences, electric transmission and gas lines, irrigation infrastructure).

Operational emissions associated with CM2–CM11 would primarily result from vehicle trips for site inspections, monitoring, and routine maintenance. The intensity and frequency of vehicle trips associated with routine maintenance are assumed to be relatively minor. Because the specific areas and process for implementing CM2–CM11 has not been determined, this effect is evaluated qualitatively.

Table 22-29 summarizes potential construction and operational emissions that may be generated by implementation of CM2–CM11. Activities with the greatest potential to have short or long-term air quality effects are denoted with an asterisk (*).

CM2–CM11 restoration activities would occur in all air districts. Construction and operational emissions associated with the restoration and enhancement actions under Alternative 4 could potentially exceed applicable general conformity *de minimis* levels listed in Table 22-9 and applicable local thresholds listed in Table 22-8. The effect would vary according to the equipment used in construction of a specific conservation measure, the location, the timing of the actions called for in the conservation measure, and the air quality conditions at the time of implementation; these effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. The effect of increases in emissions during implementation of CM2–CM11 in excess of applicable general conformity *de minimis* levels and air district regional thresholds (Table 22-8) could violate air basin SIPs and worsen existing air quality conditions. Mitigation Measure AQ-24 would be available to reduce this effect, but emissions would still be adverse.

***CEQA Conclusion*:** Construction and operational emissions associated with the restoration and enhancement actions would result in a significant impact if the incremental difference, or increase, relative to Existing Conditions exceeds the applicable local air district thresholds shown in Table 22-8; these effects are expected to be further evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measure AQ-24 would be available to reduce this effect, but may not be sufficient to reduce emissions below applicable air quality management district thresholds (see Table 22-8). Consequently, this impact would be significant and unavoidable.

Mitigation Measure AQ-24: Develop an Air Quality Mitigation Plan (AQMP) to Ensure Air District Regulations and Recommended Mitigation are Incorporated into Future Conservation Measures and Associated Project Activities

BDCP proponents will develop an AQMP prior to the commencement of any construction, operational, or other physical activities associated with CM2–CM11 that would involve adverse effects to air quality. The AQMP will be incorporated into the site-specific environmental review for all conservation measures or project activities. BDCP proponents will ensure that the following measures are implemented to reduce local and regional air quality impacts. Not all measures listed below may be feasible or applicable to each conservation measure. Rather, these measures serve as an overlying mitigation framework to be used for specific conservation measures. The applicability of measures listed below may also vary based on the lead agency, location, timing, available technology, and nature of each conservation measure.

- Implement basic and enhanced dust control measures recommended by local air districts in the project-area. Applicable control measures may include, but are not limited to, watering exposed surfaces, suspended project activities during high winds, and planting vegetation cover in disturbed areas.

- Require construction equipment be kept in proper working condition according to manufacturer's specifications.
- Ensure emissions from all off-road diesel-powered equipment used to construct the project do not exceed applicable air district rules and regulations (e.g., nuisance rules, opacity restrictions).
- Reduce idling time by either shutting equipment off when not in use or limiting the time of idling to less than required by the current statewide idling restriction.
- Reduce criteria pollutant exhaust emissions by requiring the latest emissions control technologies. Applicable control measures may include, but are not limited to, engine retrofits, alternative fuels, electrification, and add-on technologies (e.g., DPF).
- Undertake in good faith an effort to enter into a development mitigation contract with the local air district to offset criteria pollutant emissions below applicable air district thresholds through the payment of mitigation fees.

Implementation of this measure will reduce criteria pollutant emissions generated by construction, operational, or other physical activities associated with CM2–CM11. The applicability of measures listed above may vary based on the lead agency, location, timing, available technology, and nature of each conservation measure. If the above measures do not contribute to emissions reductions, guidelines will be developed to ensure that criteria pollutants generated during construction and project operations are reduced to the maximum extent practicable.

Impact AQ-25: Exposure of Sensitive Receptors to Health Hazards from Localized Particulate Matter, Carbon Monoxide, and Diesel Particulate Matter from Implementation of CM2–CM11

Additional traffic and heavy-duty equipment required to implement CM2-CM11 would generate emissions that could expose nearby receptors to local concentrations of PM, CO, and DPM. Fugitive dust particulate matter concentrations are expected to be highest in the vicinity of restoration areas, particularly near those sites that require substantial earthmoving activities or site grading. The potential for CO hot-spots would be greatest along transportation routes used for site inspections, monitoring, and routine maintenance. DPM concentrations would likely be greatest along vehicle haul routes and adjacent to restoration sites that require substantial off-road equipment.

Sensitive receptors near restoration sites and haul routes could be exposed to increased PM, CO, and DPM concentrations. Because the extent of construction and operational activities is not known at this time, a determination of effects based on a quantitative analysis is not possible. Activities shown in Table 22-29 with the greatest potential to have short or long-term air quality impacts are also anticipated to have the greatest potential to expose receptors to substantial pollutant concentrations. The effect would vary according to the equipment used, the location and timing of the actions called for in the conservation measure, the meteorological and air quality conditions at the time of implementation, and the location of receptors relative to the emission source. Potential health effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions.

The effect of increases in PM, CO, or DPM (cancer and non-cancer-risk) in excess of applicable air district thresholds (Table 22-8) at receptor locations could result in adverse health impacts. Mitigation Measures AQ-24 and AQ-25 would be available to reduce this effect.

***CEQA Conclusion*:** Construction and operational emissions associated with the restoration and enhancement actions under Alternative 4 would result in a significant impact if PM, CO, or DPM (cancer and non-cancer-risk) concentrations at receptor locations exceed the applicable local air district thresholds shown in Table 22-8; these effects are expected to be further evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measures AQ-24 and AQ-25 would ensure localized concentrations at receptor locations would be below applicable air quality management district thresholds (see Table 22-8). Consequently, this impact would be less than significant.

Mitigation Measure AQ-24: Develop an Air Quality Mitigation Plan (AQMP) to Ensure Air District Regulations and Recommended Mitigation are Incorporated into Future Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-24 under Impact AQ-24 in the discussion of Alternative 4.

Mitigation Measure AQ-25: Prepare a Project-Level Health Risk Assessment to Reduce Potential Health Risks from Exposure to Localized DPM and PM Concentrations

The site-specific environmental review for all conservation measures will perform a detailed health risk assessment (HRA) if sensitive receptors are located within 0.50 mile of project activities. The half-mile buffer represents the furthest distance at which Plan Area air districts recommend performing a HRA as pollutant concentrations dissipate as a function of distance from the emissions source. The site-specific HRA will evaluate potential health risks to nearby sensitive receptors from exposure to DPM and PM (as recommended by the local air district's CEQA Guidelines) and ensure that impacts are below applicable air district health risk thresholds. If the HRA identifies health risks in excess of applicable air district health risk thresholds, additional mitigation and/or site design changes will be incorporated into the site-specific environmental review to ensure health risks are reduced below applicable air district health risk thresholds. Examples of potential additional mitigation include use aftermarket equipment controls (e.g., diesel particulate filters), alternative fuels, and advanced engine technologies (e.g., Tier 4 engines), as well as construction of vegetative buffers and receptor relocation.

Impact AQ-26: Creation of Potential Odors Affecting a Substantial Number of People from Implementation of CM2–CM11

Implementation of CM2–CM11 will convert land types to increase available habitat for BDCP covered species (e.g., cultivated land converted to tidal natural communities). Diesel emissions from earthmoving equipment could generate temporary odors, but these would quickly dissipate and cease once construction is completed. Accordingly, construction activities associated with CM2–CM11 are not anticipated to result in nuisance odors.

Among the land use types affected by the program, the conservation measures would restore estuarine wetland and upland habitats, both of which can generate odors from natural processes. Odors from wetlands are typically caused from organic decomposition that releases hydrogen sulfide gas. Similar reactions take place in tidal mudflats due to anaerobic decomposition caused by bacteria (National Oceanic and Atmospheric Administration 2008). While restored land uses associated with the program have the potential to generate odors from natural processes, the emissions would be similar in origin and magnitude to the existing land use types in the restored area (e.g., managed wetlands). Moreover, specific odor effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Accordingly, odor-related effects associated with CM2–CM11 would not be adverse.

CEQA Conclusion**:** Alternative 4 would not result in the addition of major odor producing facilities. Diesel emissions during construction could generate temporary odors, but these would quickly dissipate and cease once construction is completed. Increases in wetland, tidal, and upland habitats may increase the potential for odors from natural processes. However, the origin and magnitude of odors would be similar to the existing land use types in the restored area (e.g., managed wetlands). Moreover, specific odor impacts would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Accordingly, the impact of exposure of sensitive receptors to potential odors would be less than significant. No mitigation is required.

Impact AQ-27: Generation of Cumulative Greenhouse Gas Emissions from Implementation of CM2–CM11

NEPA Effects: CM2–CM11 implemented under Alternative 4 would result in local GHG emissions from construction equipment and vehicle exhaust. Restoration activities with the greatest potential for emissions include those that break ground and require use of earthmoving equipment. The type of restoration action and related construction equipment use are shown in Table 22-29. Implementing CM2–CM11 would also affect long-term sequestration rates through land use changes, such as conversion of agricultural land to wetlands, inundation of peat soils, drainage of peat soils, and removal or planting of carbon-sequestering plants.

Without additional information on site-specific characteristics associated with each of the restoration components, a complete assessment of GHG flux from CM2–CM11 is currently not possible. The effect of carbon sequestration and CH_4 generation would vary by land use type, season, and chemical and biological characteristics; these effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measures AQ-24 and AQ-27 would be available to reduce this effect. However, due to the potential for increases in GHG emissions from construction and land use change, this effect would be adverse.

CEQA Conclusion**:** The restoration and enhancement actions under Alternative 4 could result in a significant impact if activities are inconsistent with applicable GHG reduction plans, do not contribute to a lower carbon future, or generate excessive emissions, relative to other projects throughout the state. These effects are expected to be further evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measures AQ-24 and AQ-27 would be available to reduce this impact, but may not be sufficient to reduce to a less-than-significant level. Consequently, this impact is would be significant and unavoidable.

Mitigation Measure AQ-24: Develop an Air Quality Mitigation Plan (AQMP) to Ensure Air District Regulations and Recommended Mitigation are Incorporated into Future Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-24 under Impact AQ-24 in the discussion of Alternative 4.

Mitigation Measure AQ-27: Prepare a Land Use Sequestration Analysis to Quantify and Mitigate (as Needed) GHG Flux Associated with Conservation Measures and Associated Project Activities

BDCP proponents will prepare a land use sequestration analysis to evaluate GHG flux associated with implementation of CM2–CM11. The land use analysis will evaluate the one-time carbon storage loss associated with vegetation removal, soil carbon content, and existing and future with project GHG flux. In the event that the land use analysis demonstrates a net positive GHG flux, feasible strategies to reduce GHG emissions will be undertaken. To the extent feasible, mitigation shall require project design changes so that land uses that serve as carbon sinks (i.e., result in net decreases in carbon) are not replaced with other uses that are sources (i.e., result in net increases in carbon) of GHG emissions.

22.3.3.10 Alternative 5—Dual Conveyance with Pipeline/Tunnel and Intake 1 (3,000 cfs; Operational Scenario C)

One intake would be constructed under Alternative 5. For the purposes of this analysis, it was assumed that Intake 1 (on the east bank of the Sacramento River), an intermediate forebay, and a buried pipeline and tunnel conveyance would be constructed under Alternative 5 (Figures 3-2 and 3-12 in Chapter 3, *Description of Alternatives*).

Construction and operation of Alternative 5 would require the use of electricity, which would be supplied by the California electrical grid. Power plants located throughout the state supply the grid with power, which will be distributed to the Study area to meet project demand. Power supplied by statewide power plants will generate criteria pollutants. Because these power plants are located throughout the state, criteria pollutant emissions associated with Alternative 5 electricity demand cannot be ascribed to a specific air basin or air district within the Study area. Criteria pollutant emissions from electricity consumption, which are summarized in Table 22-116, are therefore provided for informational purposes only and are not included in the impact conclusion. Negative values represent an emissions benefit, relative to the No Action Alternative or Existing Conditions.

Table 22-116 Criteria Pollutant Emissions from Electricity Consumption: Construction and Net Project Operations, Alternative 5 (tons/year)[a,b]

Year	Analysis	ROG	CO	NO_X	PM10	PM2.5[c]	SO_2
2016	-	0	0	0	0	0	0
2017	-	0	0	0	0	0	0
2018	-	<1	<1	<1	<1	<1	<1
2019	-	<1	1	<1	<1	<1	1
2020	-	<1	6	<1	1	1	3
2021	-	<1	17	1	1	1	7
2022	-	<1	24	2	2	2	10
2023	-	<1	21	2	2	2	9
2024	-	<1	22	2	2	2	9
2025	-	<1	15	1	1	1	6
2026	-	<1	5	<1	<1	<1	2
2027	-	<1	1	<1	<1	<1	<1
2028	-	<1	<1	<1	<1	<1	<1
2029	-	<1	<1	<1	<1	<1	<1
ELT	CEQA	<1	2	22	2	2	9
LLT	NEPA	1	7	93	8	8	39
LLT	CEQA	-1	-5	-72	-6	-6	-30

NEPA = Compares criteria pollutant emissions after implementation of Alternative 5 to the No Action Alternative.

CEQA = Compares criteria pollutant emissions after implementation of Alternative 5 to Existing Conditions.

[a] Emissions assume implementation of RPS (see Appendix 22A, *Air Quality Analysis Methodology*). Power plants that generate electricity for the proposed project would be subject to local air district permitting requirements, including standards to implement BACT to reduce criteria pollutant emissions.

[b] Because GHG emissions are cumulative (see Section 22.3.2.1) and not evaluated at the local air basin or air district level, they are discussed in Impacts AQ-21 and AQ-22. The GHG analysis for SWP power utilizes actual and forecasted GHG emissions rates for the SWP system, which differs slightly from the above analysis. Statewide grid average emission factors were utilized for the above analysis as criteria pollutant emission factors for SWP were unavailable. Please also note that the above analysis does not account for additional renewable energy that will be procured through modifications to DWR's REPP (see Impact AQ-22). Accordingly, the emissions results presented above represent a conservative assessment of potential criteria pollutant emissions.

[c] Emission factors for PM2.5 are currently unavailable. Consequently, PM2.5 emissions were assumed to equal PM10 emissions. Because PM2.5 represents a fraction of PM10, this approach represents a conservative assessment of PM2.5 emissions from electricity consumption.

Construction activities would generate emissions of ozone precursors (ROG and NO_X), CO, PM10, PM2.5, and SO_2. Table 22-117 summarizes criteria pollutant emissions that would be generated in the BAAQMD, SMAQMD, SJVAPCD, and YSAQMD in pounds per day and tons per year. Emissions estimates include implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*). Although emissions are presented in different units (pounds and tons), the amounts of emissions are identical (i.e., 2,000 pounds is identical to 1 ton). Summarizing emissions in both pounds per day and tons per year is necessary to evaluate project-level effects against the appropriate air district thresholds, which are given in both pounds and tons (see Table 22-8).

As shown in Appendix 22B, *Air Quality Assumptions*, construction activities during several phases will likely occur concurrently. To ensure a conservative analysis, the maximum daily emissions during these periods of overlap were estimated assuming all equipment would operate at the same time—this gives the maximum total project-related air quality impact during construction. Accordingly, the daily emissions estimates represent a conservative assessment of construction impacts. Exceedances of the air district thresholds are shown in underlined text.

1 **Table 22-117. Criteria Pollutant Emissions from Construction of Alternative 5 (pounds/day and tons/year)**

	Maximum Daily Emissions (pounds/day)										Annual Emissions (tons/year)									
	Bay Area Air Quality Management District										Bay Area Air Quality Management District									
				PM10			PM2.5							PM10			PM2.5			
Year	ROG	NO_X	CO	Exhaust	Dust	Total	Exhaust	Dust	Total	SO_2	ROG	NO_X	CO	Exhaust	Dust	Total	Exhaust	Dust	Total	SO_2
2016	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2017	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2018	7	101	47	1	64	64	1	15	16	1	<1	1	1	<1	1	1	<1	<1	<1	<1
2019	21	247	139	1	114	115	1	27	29	2	2	13	12	<1	2	2	<1	<1	<1	<1
2020	31	332	206	2	135	137	2	33	35	2	3	22	19	<1	3	4	<1	1	1	<1
2021	34	348	216	3	142	145	2	35	37	3	4	29	25	<1	5	6	<1	1	1	<1
2022	38	397	236	2	172	174	2	43	45	3	4	32	26	<1	7	8	<1	2	2	<1
2023	96	777	564	7	317	324	6	63	70	6	7	52	43	1	19	19	<1	3	4	<1
2024	104	909	604	7	436	444	7	93	100	8	11	78	66	1	24	25	1	4	5	1
2025	96	856	548	6	405	411	6	89	95	8	7	46	40	<1	16	16	<1	3	3	<1
2026	62	617	370	5	355	359	4	79	83	7	5	35	30	<1	14	14	<1	2	3	<1
2027	53	513	311	5	310	316	5	68	73	6	3	18	16	<1	11	12	<1	2	2	<1
2028	17	243	105	1	238	239	1	52	53	3	<1	1	1	<1	4	4	<1	1	1	<1
2029	8	154	49	1	113	113	1	29	30	2	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Thresholds	*54*	*54*	-	*82*	*BMPs*	-	*54*	*BMPs*	-	-	-	-	-	-	-	-	-	-	-	-
	Sacramento Metropolitan Air Quality Management District										Sacramento Metropolitan Air Quality Management District									
				PM10			PM2.5							PM10			PM2.5			
Year	ROG	NO_X	CO	Exhaust	Dust	Total	Exhaust	Dust	Total	SO_2	ROG	NO_X	CO	Exhaust	Dust	Total	Exhaust	Dust	Total	SO_2
2016	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2017	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2018	24	273	162	5	78	83	4	13	18	1	1	9	6	<1	5	5	<1	1	1	<1
2019	43	448	305	5	231	236	4	39	43	2	2	14	19	<1	16	17	<1	2	2	<1
2020	63	688	436	8	291	298	7	46	53	3	6	47	39	1	24	25	1	3	4	<1
2021	71	790	581	8	361	369	8	58	66	3	7	67	58	1	34	35	1	5	6	<1
2022	84	889	723	8	374	381	8	61	68	4	9	75	84	1	35	36	1	5	6	<1
2023	123	1,193	957	13	489	502	12	77	89	8	13	100	108	1	42	43	1	6	7	<1
2024	242	2,231	1,504	30	673	703	28	120	149	11	18	134	126	2	45	47	2	7	9	1
2025	219	2,059	1,354	27	613	640	26	110	136	11	18	129	114	2	31	34	2	5	7	<1
2026	197	1,639	1,068	23	460	483	22	89	111	9	17	121	104	2	29	31	2	4	7	<1
2027	199	1,787	1,174	26	501	527	25	94	119	10	13	98	80	2	31	33	2	5	6	<1
2028	58	618	393	4	330	333	4	64	67	4	2	16	18	<1	18	19	<1	3	3	<1
2029	22	331	164	2	171	173	2	38	40	3	<1	3	3	<1	3	3	<1	<1	<1	<1
Thresholds	-	*85*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Year	San Joaquin Valley Air Pollution Control District										San Joaquin Valley Air Pollution Control District									
	ROG	NOx	CO	PM10			PM2.5			SO_2	ROG	NOx	CO	PM10			PM2.5			SO_2
				Exhaust	Dust	Total	Exhaust	Dust	Total					Exhaust	Dust	Total	Exhaust	Dust	Total	
2016	0	0	0	0	29	29	0	4	4	0	0	0	0	0	2	2	0	<1	<1	0
2017	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2018	22	105	154	2	94	96	2	12	13	1	1	5	8	<1	9	10	<1	1	1	<1
2019	75	581	542	6	155	162	6	20	26	2	8	63	60	1	15	15	1	2	2	<1
2020	147	1,078	1,038	14	246	260	13	30	44	4	15	108	106	1	27	29	1	3	5	<1
2021	210	1,605	1,477	22	563	586	21	66	87	5	23	168	168	2	44	46	2	5	7	1
2022	155	1,036	1,145	12	219	231	12	28	40	3	22	144	162	2	26	28	2	3	5	<1
2023	136	856	994	9	142	151	9	19	28	3	19	117	143	1	14	15	1	2	3	<1
2024	133	799	955	8	121	129	8	16	24	3	18	107	131	1	13	14	1	2	3	<1
2025	111	650	746	6	97	103	6	13	19	2	12	71	81	1	11	12	1	1	2	<1
2026	73	459	466	4	60	64	4	7	11	2	5	29	27	<1	2	3	<1	<1	1	<1
2027	1	1	4	3	1	4	3	<1	3	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
2028	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2029	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Thresholds	-	-	-	-	-	-	-	-	-	-	*10*	*10*	-	-	-	*15*	-	-	*15*	-

Year	Yolo Solano Air Quality Management District										Yolo Solano Air Quality Management District									
	ROG	NOx	CO	PM10			PM2.5			SO_2	ROG	NOx	CO	PM10			PM2.5			SO_2
				Exhaust	Dust	Total	Exhaust	Dust	Total					Exhaust	Dust	Total	Exhaust	Dust	Total	
2016	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2017	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2018	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2019	3	83	17	<1	22	23	<1	6	6	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
2020	3	83	18	<1	22	23	<1	6	6	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
2021	4	99	22	<1	27	28	<1	7	7	1	<1	2	<1	<1	1	1	<1	<1	<1	<1
2022	6	142	32	<1	41	41	<1	11	11	1	<1	5	1	<1	1	1	<1	<1	<1	<1
2023	6	142	38	<1	51	51	<1	13	14	1	<1	4	1	<1	2	2	<1	<1	<1	<1
2024	6	138	38	<1	51	51	<1	13	14	1	<1	4	1	<1	1	1	<1	<1	<1	<1
2025	6	126	35	<1	48	48	<1	12	13	1	<1	3	1	<1	1	1	<1	<1	<1	<1
2026	5	102	29	<1	39	40	<1	10	10	1	<1	3	1	<1	1	1	<1	<1	<1	<1
2027	5	98	29	<1	39	40	<1	10	10	1	<1	2	1	<1	1	1	<1	<1	<1	<1
2028	3	50	15	<1	20	20	<1	5	5	<1	<1	2	1	<1	1	1	<1	<1	<1	<1
2029	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Thresholds	-	-	-	-	-	*80*	-	-	-	-	*10*	*10*	-	-	-	-	-	-	-	-

Operation and maintenance activities under Alternative 5 would result in emissions of ROG, NO_X, CO, PM10, PM2.5, and SO_2. Emissions were quantified for both ELT and LLT conditions, although activities would take place annually until project decommissioning. Future emissions, in general, are anticipated to lessen because of continuing improvements in vehicle and equipment engine technology.

Table 22-118 summarizes criteria pollutant emissions associated with operation of Alternative 5 in the BAAQMD, SMAQMD, and SJVAPCD in pounds per day and tons per year (no operational emissions would be generated in the YSAMQD). Although emissions are presented in different units (pounds and tons), the amounts of emissions are identical (i.e., 2,000 pounds is identical to 1 ton). Summarizing emissions in both pounds per day and tons per year is necessary to evaluate project-level effects against the appropriate air district thresholds, which are given in both pounds and tons (see Table 22-8).

Table 22-118. Criteria Pollutant Emissions from Operation of Alternative 5 (pounds per day and tons per year)

	Maximum Daily Emissions (pounds/day)						Annual Emissions (tons/year)					
	Bay Area Air Quality Management District						Bay Area Air Quality Management District					
Condition	ROG	NO_X	CO	PM10	PM2.5	SO_2	ROG	NO_X	CO	PM10	PM2.5	SO_2
ELT	3	19	32	6	2	<1	0.01	0.08	0.14	0.02	0.01	<0.01
LLT	3	16	31	6	1	<1	0.01	0.07	0.13	0.02	0.01	<0.01
Thresholds	*54*	*54*	-	*82*	*82*	-	-	-	-	-	-	
	Sacramento Metropolitan Air Quality Management District						Sacramento Metropolitan Air Quality Management District					
Condition	ROG	NO_X	CO	PM10	PM2.5	SO_2	ROG	NO_X	CO	PM10	PM2.5	SO_2
ELT	3	20	36	6	2	<1	0.06	0.38	0.74	0.12	0.04	<0.01
LLT	3	17	34	6	2	<1	0.05	0.32	0.71	0.12	0.03	<0.01
Thresholds	*65*	*65*	-	-	-	-	-	-	-	-	-	-
	San Joaquin Valley Air Pollution Control District						San Joaquin Valley Air Pollution Control District					
Condition	ROG	NO_X	CO	PM10	PM2.5	SO_2	ROG	NO_X	CO	PM10	PM2.5	SO_2
ELT	3	19	36	6	2	<1	0.01	0.07	0.13	0.02	<0.01	<0.01
LLT	3	16	33	6	1	<1	0.01	0.06	0.12	0.01	<0.01	<0.01
Thresholds	-	-	-	-	-	-	*10*	*10*	-	*15*	*15*	-

Impact AQ-1: Generation of Criteria Pollutants in Excess of the SMAQMD Regional Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: As shown in Table 22-117, construction emissions would exceed SMAQMD's daily NO_X threshold for all years between 2018 and 2029, even with implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*). Since NO_X is a precursor to ozone and PM, exceedances of SMAQMD's daily NO_X threshold could impact both regional ozone and PM formation, which could worsen regional air quality and air basin attainment of the NAAQS and CAAQS.

While equipment could operate at any work area identified for this alternative, the highest level of NO_X emissions in the SMAQMD is expected to occur at those sites where the duration and intensity of construction activities would be greatest. This includes all intake and intake pumping plant sites along the east bank of the Sacramento River, as well as the intermediate forebay (and pumping plant) site west of South Stone Lake and east of the Sacramento River.

Environmental commitments will reduce construction-related emissions; however, as shown in Table 22-117, emissions would still exceed the air district threshold identified in Table 22-8 and would result in an adverse effect to air quality. Mitigation Measures AQ-1a and AQ-1b would be available to reduce NO_X emissions, and would thus address regional effects related to secondary ozone and PM formation.

***CEQA Conclusion*:** NO_X emissions generated during construction would exceed SMAQMD threshold identified in Table 22-8. Since NO_X is a precursor to ozone and PM, exceedances of SMAQMD's daily NO_X threshold could impact both regional ozone and PM formation. SMAQMD's regional emissions thresholds (Table 22-8) and PM10 screening criteria have been adopted to ensure projects do not hinder attainment of the CAAQS or NAAQS. The impact of generating NO_X emissions in excess of local air district thresholds would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Mitigation Measures AQ-1a and AQ-1b would be available to reduce NO_X emissions to a less-than-significant level by offsetting emissions to quantities below SMAQMD CEQA thresholds (see Table 22-8).

Mitigation Measure AQ-1a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-1a under Impact AQ-1 in the discussion of Alternative 1A.

Mitigation Measure AQ-1b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-1b under Impact AQ-1 in the discussion of Alternative 1A.

Impact AQ-2: Generation of Criteria Pollutants in Excess of the YSAQMD Regional Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: As shown in Table 22-117, construction emissions would not exceed YSAQMD regional thresholds. Accordingly, there would be no adverse air quality effect.

***CEQA Conclusion*:** Construction emissions would not exceed YSAQMD regional thresholds. Accordingly, this impact would be less than significant.

Impact AQ-3: Generation of Criteria Pollutants in Excess of the BAAQMD Regional Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: As shown in Table 22-117, construction emissions would exceed BAAQMD's daily thresholds for the following pollutants and years, even with implementation of environmental commitments. All other pollutants would be below air district thresholds and therefore would not result in an adverse air quality effect.

- ROG: 2023–2026
- NO_X: 2018–2029

Since ROG and NO_X are precursors to ozone and NO_X is a precursor to PM, exceedances of BAAQMD's ROG and NO_X thresholds could impact both regional ozone and PM formation, which could worsen regional air quality and air basin attainment of the NAAQS and CAAQS.

While equipment could operate at any work area identified for this alternative, the highest level of ROG and NO_X emissions in the BAAQMD are expected to occur at those sites where the duration and intensity of construction activities would be greatest, including the site of the Byron Tract Forebay adjacent to and south of Clifton Court Forebay.

Environmental commitments outlined in Appendix 3B, *Environmental Commitments,* will reduce construction-related emissions; however, as shown in Table 22-117, ROG and NO_X emissions would still exceed BAAQMD's regional thresholds identified in Table 22-8 and would result in an adverse effect to air quality. Mitigation Measures AQ-3a and AQ-3b are available to reduce ROG and NO_X emissions, and would thus address regional effects related to secondary ozone and PM formation.

CEQA Conclusion**:** Emissions of ROG and NO_X generated during construction would exceed BAAQMD thresholds identified in Table 22-8. Since ROG and NO_X are precursors to ozone and NO_X is a precursor to PM, exceedances of BAAQMD's ROG and NO_X thresholds could impact both regional ozone and PM formation. The BAAQMD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS or NAAQS. The impact of generating emissions in excess of BAAQMD's regional thresholds would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Mitigation Measures AQ-3a and AQ-3b would be available to reduce ROG and NO_X emissions to a less-than-significant level by offsetting emissions to quantities below BAAQMD CEQA thresholds (see Table 22-8).

Mitigation Measure AQ-3a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within BAAQMD/SFBAAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable BAAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-3a under Impact AQ-3 in the discussion of Alternative 1A.

Mitigation Measure AQ-3b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the BAAQMD/SFBAAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable BAAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-3b under Impact AQ-3 in the discussion of Alternative 1A.

Impact AQ-4: Generation of Criteria Pollutants in Excess of the SJVAPCD Regional Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: As shown in Table 22-117, construction emissions would exceed SJVAPCD's annual thresholds for the following pollutants and years, even with implementation of environmental commitments. All other pollutants would be below air district thresholds and therefore would not result in an adverse air quality effect.

- ROG: 2020–2025
- NO_X: 2019–2026
- PM10: 2019–2023

Since ROG and NO_X are precursors to ozone and NO_X is a precursor to PM, exceedances of SJVAPCD's ROG and NO_X thresholds could impact both regional ozone and PM formation, which could worsen regional air quality and air basin attainment of the NAAQS and CAAQS. Similarly, exceedances of SJVAPCD's PM10 threshold could impede attainment of the NAAQS and CAAQS for PM10.

While equipment could operate at any work area identified for this alternative, the highest level of ROG, NO_X, and PM10 emissions in the SJVAPCD is expected to occur at those sites where the duration and intensity of construction activities would be greatest. This includes all temporary and permanent utility sites, as well as all construction sites along the pipeline/tunnel conveyance alignment. For a map of the proposed tunnel alignment, see Mapbook Figure M3-1.

Environmental commitments outlined in Appendix 3B, *Environmental Commitments,* will reduce construction-related emissions; however, as shown in Table 22-117, ROG, NO_X, and PM10 emissions would still exceed SJVAPCD's regional thresholds identified in Table 22-8 and would result in an adverse effect to air quality. Mitigation Measures AQ-4a and AQ-4b are available to reduce ROG, NO_X, and PM10 emissions, and would thus address regional effects related to secondary ozone and PM formation.

***CEQA Conclusion*:** Emissions of ROG, NO_X, and PM10 generated during construction would exceed SJVAPCD's annual significance threshold identified in Table 22-8. Since ROG and NO_X are precursors to ozone and NO_X is a precursor to PM, exceedances of SJVAPCD's ROG and NO_X thresholds could impact both regional ozone and PM formation, which could worsen regional air quality and air basin attainment of the NAAQS and CAAQS. Similarly, exceedances of SJVAPCD's PM10 threshold could impede attainment of the NAAQS and CAAQS for PM10. SJVAPCD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS or NAAQS. The impact of generating ROG, NO_X, and PM10 emissions in excess of local air district thresholds would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Mitigation Measures AQ-4a and AQ-4b would be available to reduce ROG, NO_X, and PM10 emissions to a less-than-significant level by offsetting emissions to quantities below SJVAPCD CEQA thresholds (see Table 22-8).

Mitigation Measure AQ-4a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4a under Impact AQ-4 in the discussion of Alternative 1A.

Mitigation Measure AQ-4b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4b under Impact AQ-4 in the discussion of Alternative 1A.

Impact AQ-5: Generation of Criteria Pollutants in Excess of the SMAQMD Regional Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance in SMAQMD include both routine activities and yearly maintenance. Daily activities at all pumping plants and intakes are covered by maintenance, management, repair, and operating crews. Yearly maintenance would include annual inspections, tunnel dewatering, and sediment removal (see Appendix 22A, *Air Quality Analysis Methodology,* for additional detail). The highest concentration of operational emissions in the SMAQMD are expected at intake and intake pumping plant sites along the east bank of the Sacramento River, as well as at the intermediate forebay (and pumping plant) site west of South Stone Lake and east of the Sacramento River. As shown in Table 22-118, operation and maintenance activities under Alternative 5 would not exceed SMAQMD's regional thresholds of significance and there would be no adverse effect (see Table 22-8). Accordingly, project operations would not contribute to or worsen existing air quality exceedances. There would be no adverse effect.

CEQA Conclusion**:** Emissions generated during operation and maintenance activities would not exceed SMAQMD regional thresholds for criteria pollutants. SMAQMD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS or NAAQS. The impact of generating emissions in excess of local air district would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Because project operations would not exceed SMAQMD regional thresholds, the impact would be less than significant. No mitigation is required.

Impact AQ-6: Generation of Criteria Pollutants in Excess of the YSAQMD Regional Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Alternative 5 would not construct any permanent features in the YSAQMD that would require routine operations and maintenance. No operational emissions would be generated in the YSAQMD. Consequently, operation of Alternative 5 would neither exceed the YSAQMD thresholds of significance nor result in an adverse effect on air quality.

CEQA Conclusion**:** Operational emissions generated by the alternative would not exceed YSAQMD's regional thresholds of significance. This impact would be less than significant. No mitigation is required.

Impact AQ-7: Generation of Criteria Pollutants in Excess of the BAAQMD Regional Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance in BAAQMD include annual inspections, sediment removal, and tunnel dewatering (see Appendix 22A, *Air Quality Analysis Methodology,* for additional detail). The highest concentration of operational emissions in the BAAQMD are expected at the Byron Tract Forebay (including control gates), which is adjacent to and south of Clifton Court

Forebay. As shown in Table 22-118, operation and maintenance activities under Alternative 5 would not exceed BAAQMD's regional thresholds of significance (see Table 22-8). Thus, project operations would not contribute to or worsen existing air quality exceedances. There would be no adverse effect.

CEQA Conclusion: Emissions generated during operation and maintenance activities would not exceed BAAQMD regional thresholds for criteria pollutants. BAAQMD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS or NAAQS. The impact of generating emissions in excess of local air district thresholds would violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Because project operations would not exceed BAAQMD regional thresholds, the impact would be less than significant. No mitigation is required.

Impact AQ-8: Generation of Criteria Pollutants in Excess of the SJVAPCD Regional Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance in SJVAPCD include annual inspections and tunnel dewatering (see Appendix 22A, *Air Quality Analysis Methodology,* for additional detail). The highest concentration of operational emissions in the SJVPACD is expected at construction sites along the pipeline/tunnel conveyance alignment. For a map of the proposed tunnel alignment, see Mapbook Figure M3-1. As shown in Table 22-116, operation and maintenance activities under Alternative 5 would not exceed SJVAPCD's regional thresholds of significance (see Table 22-8). Accordingly, project operations would not contribute to or worsen existing air quality exceedances. There would be no adverse effect.

CEQA Conclusion: Emissions generated during operation and maintenance activities would not exceed SJVAPCD's regional thresholds of significance. SJVAPCD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS or NAAQS. The impact of generating emissions in excess of local air district thresholds would violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Because project operations would not exceed SJVAPCD regional thresholds, the impact would be less than significant. No mitigation is required.

Impact AQ-9: Exposure of Sensitive Receptors to Health Hazards from Localized Particulate Matter in Excess of SMAQMD's Health-Based Concentration Thresholds

NEPA Effects: Alternative 5 involves the development of four less intakes (approximately 80% volumetric reduction) as compared to Alternative 1A. As such, emissions generated by construction of Alternative 5 would be lower than Alternative 1A due to less construction activities. Localized health risk impacts resulting from construction emissions at Intakes 2, 3, 4, and 5 would be much lower or not occur due to absence in the development of these project features. Based on the emissions inventory conducted for the air quality analysis, development of Alternative 5 would result in 46% less PM10 emissions and 45% less PM2.5 emissions as compared with Alternative 1A.

All annual PM10 and PM2.5 concentrations were found to be less than SMAQMD's annual thresholds for Alternative 1A. Because Alternative 5 would require less construction activity and generate fewer emissions than Alternative 1A, annual PM10 and PM2.5 concentrations from the development of Alternative 5 would also be less than the respective SMAQMD annual thresholds. However, as shown in Table 22-14, the maximum predicted 24-hour PM10 concentration for Alternative 1A would exceed SMAQMD's threshold of 2.5 $\mu g/m^3$. The modeled exceedances occur at 225 receptor locations near intakes and intake work areas. Because Alternative 5 would not involve the development of Intakes 2, 3, 4, and 5, emissions contributions from these intakes would not occur. It is anticipated that Alternative 5 would still result in 24-hour PM10 exceedances in the vicinity of Intake 1, but at fewer receptor locations than Alternative 1A. Accordingly, this alternative would expose a sensitive receptor to adverse levels of localized particulate matter concentrations. Mitigation Measure AQ-9 is available to address this effect.

CEQA Conclusion: Respirable particulates pose a human health hazard by bypassing the defenses within the mucous ciliary system and entering deep lung tissue. Construction of Alternative 5 would result in the short-term exposure of receptors to PM10 concentrations that exceed SMAQMD threshold. This would be a significant impact. Mitigation Measure AQ-9 outlines a tiered strategy to reduce PM10 concentrations and public exposure to a less-than-significant level.

Mitigation Measure AQ-9: Implement Measures to Reduce Re-Entrained Road Dust and Receptor Exposure to PM2.5 and PM10

Please see Mitigation Measure AQ-9 under Impact AQ-9 in the discussion of Alternative 1A.

Impact AQ-10: Exposure of Sensitive Receptors to Health Hazards from Localized Particulate Matter in Excess of YSAQMD's Health-Based Concentration Thresholds

NEPA Effects: Table 22-15 under Alternative 1A shows that the maximum predicted PM2.5 and PM10 concentrations are less than YSAQMD's adopted thresholds. Because Alternative 5 would require less construction activity and generate fewer emissions than Alternative 1A, annual PM10 and PM2.5 concentrations from the development of Alternative 5 would also be less than the respective YSAQMD annual thresholds. The project would also implement all air district-recommended onsite fugitive dust controls, such as regular watering. Accordingly, this alternative would not expose sensitive receptors to adverse levels of localized particulate matter concentrations.

CEQA Conclusion: Respirable particulates pose a human health hazard by bypassing the defenses within the mucous ciliary system and entering deep lung tissue. Construction of Alternative 1A would result in PM2.5 and PM10 concentrations at receptor locations that are below the significance thresholds established by the YSAQMD. Since Alternative 5 results in fewer overall emissions, localized particulate matter concentrations at analyzed receptors would not result in significant human health impacts. No mitigation is required.

Impact AQ-11: Exposure of Sensitive Receptors to Health Hazards from Localized Particulate Matter in Excess of BAAQMD's Health-Based Concentration Thresholds

NEPA Effects: Table 22-16 under Alternative 1A shows that the maximum predicted PM2.5 concentrations are less than BAAQMD's adopted thresholds. Because Alternative 5 would require less construction activity and generate fewer emissions than Alternative 1A, PM2.5 concentrations from the development of Alternative 5 would also be less than the respective BAAQMD annual thresholds. The project would also implement all air district-recommended onsite fugitive dust controls, such as regular watering. Accordingly, this alternative would not expose sensitive receptors to adverse levels of localized particulate matter concentrations.

CEQA Conclusion: Respirable particulates pose a human health hazard by bypassing the defenses within the mucous ciliary system and entering deep lung tissue. Construction of Alternative 1A would result in PM2.5 concentrations at receptor locations that are below the significance thresholds established by the BAAQMD. Since Alternative 5 results in fewer overall emissions, localized particulate matter concentrations at analyzed receptors would not result in significant human health impacts. No mitigation is required.

Impact AQ-12: Exposure of Sensitive Receptors to Health Hazards from Localized Particulate Matter in Excess of SJVAPCD's Health-Based Concentration Thresholds

NEPA Effects: Table 22-17 under Alternative 1A shows that with exception of 24-hour PM10, maximum predicted PM2.5 and PM10 concentrations are less than SJVAPCD's adopted thresholds. The 24-hour PM10 concentrations attributable to the project would exceed the SJVAPCD's significance threshold at one receptor location. Emissions from the tunnel construction activities and concrete batch plant contribute to the exceedance at this location. Though Alternative 5 would result in less construction activities than Alternative 1A, it is anticipated that the receptor impacted by emissions from the concrete batch plant and tunnel activities would remain affected. Accordingly, this alternative would expose a sensitive receptor to adverse levels of localized particulate matter concentrations. Mitigation Measure AQ-9 is available to address this effect.

***CEQA Conclusion*:** Respirable particulates pose a human health hazard by bypassing the defenses within the mucous ciliary system and entering deep lung tissue. Construction of Alternative 5 would result in the short-term exposure of receptors to PM10 concentrations that exceed SJVAPCD's threshold. This would be a significant impact. Mitigation Measure AQ-9 outlines a tiered strategy to reduce PM10 concentrations and public exposure to a less-than-significant level.

Mitigation Measure AQ-9: Implement Measures to Reduce Re-Entrained Road Dust and Receptor Exposure to PM2.5 and PM10

Please see Mitigation Measure AQ-9 under Impact AQ-9 in the discussion of Alternative 1A.

Impact AQ-13: Exposure of Sensitive Receptors to Health Hazards from Localized Carbon Monoxide

NEPA Effects: Continuous engine exhaust may elevate localized CO concentrations. Receptors exposed to these CO "hot-spots" may have a greater likelihood of developing adverse health effects (as described in Section 22.1.2). CO hot-spots are typically observed at heavily congested intersections where a substantial number of gasoline-powered vehicles idle for prolonged durations throughout the day. Construction sites are less likely to result in localized CO hot-spots due to the nature of construction activities (Sacramento Metropolitan Air Quality Management District 2014), which normally utilize diesel-powered equipment for intermittent or short durations. Moreover, construction sites must comply with the Occupational Safety and Health Administration's (OSHA) CO exposure standards for onsite workers. Unlike regional pollutants (e.g., ROG and NO_X), CO concentrations also dissipate as a function of distance and will therefore be lower at offsite receptor locations. Accordingly, given that construction activities typically do not result in CO hot-spots, onsite concentrations must comply with OSHA standards, and CO levels dissipate as a function of distance, equipment-generated CO emissions (see Table 22-117) are not anticipated to result in adverse health hazards to sensitive receptors.

Construction traffic may contribute to increased roadway congestion, which could lead to conditions conducive to CO hot-spot formation. As shown in Table 19-8, the highest peak hour traffic volumes under BPBGPP—12,567 vehicles per hour—would occur on westbound Interstate 80 between

Suisun Valley Road and State Route 12.[52] This is about half of the congested traffic volume modeled by BAAQMD (24,000 vehicles per hour) that would be needed to contribute to a localized CO hot-spot, and less than half of the traffic volume modeled by SMAQMD (31,600 vehicles per hour). The BAAQMD's and SMAQMD's CO screening criteria were developed based on County average vehicle fleets that are primarily comprised of gasoline vehicles. Construction vehicles would be predominantly diesel trucks, which generate fewer CO emissions per idle-hour and vehicle mile traveled than gasoline-powered vehicles. Accordingly, the air district screening thresholds provide a conservative evaluation threshold for the assessment of potential CO emissions impacts during construction.

Based on the above analysis, even if all 12,567 vehicles on the modeled traffic segment drove through the same intersection in the peak hour, CO concentrations adjacent to the traveled way would not exceed the CAAQS or NAAQS according to BAAQMD's and SMAQMD's screening criteria. Thus, construction traffic is not anticipated to result in adverse health hazards to sensitive receptors.

***CEQA Conclusion*:** Continuous engine exhaust may elevate localized CO concentrations. Receptors exposed to these CO "hot-spots" may have a greater likelihood of developing adverse health effects. Construction sites are less likely to result in localized CO hot-spots due to the nature of construction activities (Sacramento Metropolitan Air Quality Management District 2014), which normally utilize diesel-powered equipment for intermittent or short durations. Moreover, construction sites must comply with the OSHA CO exposure standards for onsite workers. Accordingly, given that construction activities typically do not result in CO hot-spots, onsite concentrations must comply with OSHA standards, and CO levels dissipate as a function of distance, equipment-generated CO emissions are not anticipated to result in significant health hazards to sensitive receptors. Similarly, peak-hour construction traffic on local roadways would not exceed BAAQMD's or SMAQMD's conservative screening criteria for the formation potential CO hot-spots. This impact would be less than significant. No mitigation is required.

Impact AQ-14: Exposure of Sensitive Receptors to Health Hazards from Diesel Particulate Matter in Excess of SMAQMD's Chronic Non-Cancer and Cancer Risk Thresholds

NEPA Effects: As shown in Table 22-18, Alternative 1A would not exceed the SMAQMD's thresholds for chronic non-cancer hazard or cancer risk. Because Alternative 5 would require less construction activity and generate fewer emissions than Alternative 1A, chronic non-cancer hazard and cancer risk from the development of Alternative 5 would also be less than the respective SMAQMD significance thresholds. Accordingly, this alternative would not expose sensitive receptors to adverse levels of DPM such as would result in chronic non-cancer hazards or cancer risk.

***CEQA Conclusion*:** DPM generated during construction poses inhalation-related chronic non-cancer hazard and cancer risk if adjacent receptors are exposed to significant concentrations for prolonged durations. DPM generated during Alternative 5 construction would not exceed the SMAQMD's chronic non-cancer hazard or cancer risk threshold. Therefore, this impact for DPM emissions would be less than significant. No mitigation is required.

[52] The above volumes are based on the traffic analysis conducted for Alternative 1A. Since few vehicles would be required under Alternative 5, traffic impacts would likely be less than those estimated for Alternative 1A.

Impact AQ-15: Exposure of Sensitive Receptors to Health Hazards from Diesel Particulate Matter in Excess of YSAQMD's Chronic Non-Cancer and Cancer Risk Thresholds

NEPA Effects: As shown in Table 22-19, Alternative 1A would not exceed the YSAQMD's thresholds for chronic non-cancer hazard or cancer risk. Because Alternative 5 would require less construction activity and generate fewer emissions than Alternative 1A, chronic non-cancer hazard and cancer risk from the development of Alternative 5 would also be less than the respective YSAQMD significance thresholds. Accordingly, this alternative would not expose sensitive receptors to adverse levels of DPM such as would result in chronic non-cancer hazards or cancer risk.

CEQA Conclusion**:** DPM generated during construction poses inhalation-related chronic non-cancer hazard and cancer risk if adjacent receptors are exposed to significant concentrations for prolonged durations. The DPM generated during Alternative 5 construction would not exceed the YSAQMD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial health hazards. Therefore, this impact for DPM emissions would be less than significant. No mitigation is required.

Impact AQ-16: Exposure of Sensitive Receptors to Health Hazards from Diesel Particulate Matter in Excess of BAAQMD's Chronic Non-Cancer and Cancer Risk Thresholds

NEPA Effects: As shown in Table 22-20, Alternative 1A would not exceed the BAAQMD's thresholds for chronic non-cancer hazard; however, it would exceed BAAQMD's cancer risk threshold. The primary emission sources for these exceedances are from a project haul route, control structure work area and potential spoil area. While the impact of Alternative 5 would be less than Alternative 1A, Alternative 5 may still expose sensitive receptors to adverse levels of carcinogenic DPM concentrations.

Mitigation Measure AQ-16 would be available to reduce exposure to substantial cancer risk by relocating affected receptors. Although Mitigation Measure AQ-16 would reduce the severity of this effect, the BDCP proponents are not solely responsible for implementation of the measure. If a landowner chooses not to accept DWR's offer of relocation assistance, an adverse effect in the form excess cancer risk above air district thresholds would occur. Therefore, this effect would be adverse. If, however, all landowners accept DWR's offer of relocation assistance, effects would not be adverse.

CEQA Conclusion**:** DPM generated during construction poses inhalation-related chronic non-cancer hazard and cancer risk if adjacent receptors are exposed to significant concentrations for prolonged durations. The DPM generated during Alternative 5 construction would not exceed the BAAQMD's chronic non-cancer hazard threshold; however, it would exceed the BAAQMD's cancer thresholds. Therefore, this impact for DPM emissions would be significant.

Mitigation Measure AQ-16 would be available to reduce exposure to substantial cancer risk by relocating affected receptors. Although Mitigation Measure AQ-16 would reduce the severity of this effect, the BDCP proponents are not solely responsible for implementation of the measure. If a landowner chooses not to accept DWR's offer of relocation assistance, a significant impact in the form excess cancer risk above air district thresholds would occur. Therefore, this effect would be significant and unavoidable. If, however, all landowners accept DWR's offer of relocation assistance, the impact would be less than significant.

Mitigation Measure AQ-16: Relocate Sensitive Receptors to Avoid Excess Cancer Risk

Please see Mitigation Measure AQ-16 under Impact AQ-16 in the discussion of Alternative 1A.

Impact AQ-17: Exposure of Sensitive Receptors to Health Hazards from Diesel Particulate Matter in Excess of SJVAPCD's Chronic Non-Cancer and Cancer Risk Thresholds

NEPA Effects: Table 22-21 under Alternative 1A shows that the maximum predicted chronic non-cancer hazard and cancer risk associated with the project are less than SJVAPCD's adopted thresholds. Because Alternative 5 would require less construction activity and generate fewer emissions than Alternative 1A, chronic non-cancer hazard and cancer risk from the development of Alternative 5 would also be less than the respective SJVAPCD significance thresholds. Accordingly, this alternative would not expose sensitive receptors to adverse levels of DPM such as would result in chronic non-cancer hazards or cancer risk.

***CEQA Conclusion*:** DPM generated during construction poses inhalation-related chronic non-cancer hazard and cancer risk if adjacent receptors are exposed to significant concentrations for prolonged durations. The DPM generated during Alternative 5 construction would not exceed the SJVAPCD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this impact for DPM emissions would be less than significant. No mitigation is required.

Impact AQ-18: Exposure of Sensitive Receptors to *Coccidioides immitis* (Valley Fever)

***NEPA Effects*:** As discussed under Alternative 1A, earthmoving activities during construction could release *C. immitis* spores if filaments are present and other soil chemistry and climatic conditions are conducive to spore development. Receptors adjacent to the construction area may therefore be exposed to increase risk of inhaling *C. immitis* spores and subsequent development of Valley Fever. Dust-control measures are the primary defense against infection (United States Geological Survey 2000). Implementation of advanced air-district recommended fugitive dust controls outlined in Appendix 3B, *Environmental Commitments*, would avoid dusty conditions and reduce the risk of contracting Valley Fever through routine watering and other controls. Therefore, this alternative's effect of exposure of sensitive receptors to increased Valley Fever risk during construction would not be adverse.

***CEQA Conclusion*:** Construction of the water conveyance facility would involve earthmoving activities that could release *C. immitis* spores if filaments are present and other soil chemistry and climatic conditions are conducive to spore development. Receptors adjacent to the construction area may therefore be exposed to increase risk of inhaling *C. immitis* spores and subsequent development of Valley Fever. Implementation of air-district recommended fugitive dust controls outlined in Appendix 3B, *Environmental Commitments*, would avoid dusty conditions and reduce the risk of contracting Valley Fever through routine watering and other controls. Therefore, this impact would be less than significant. No mitigation is required.

Impact AQ-19: Creation of Potential Odors Affecting a Substantial Number of People during Construction or Operation of the Proposed Water Conveyance Facility

NEPA Effects: As discussed under Alternative 1A, odors from construction activities would be localized and generally confined to the immediate area surrounding the construction site. Moreover, odors would be temporary and localized, and they would cease once construction activities have

been completed. Thus, it is not anticipated that construction of CM1 would create objectionable odors from construction equipment or asphalt paving.

Construction of the water conveyance facility would require removal of subsurface material during tunnel excavation and sediment removal. As discussed under Alternative 5, geotechnical tests indicate that VOC levels in Plan Area soils are below the method detection limits, indicating that organic decay of exposed RTM and sediment will be relatively low (URS 2014). Moreover, drying and stockpiling of the removed RTM and sediment will occur under aerobic conditions, which will further limit any potential decomposition and associated malodorous products. Accordingly, it is not anticipated that tunnel and sediment excavation would create objectionable odors.

Typical facilities known to produce odors include landfills, wastewater treatment plants, food processing facilities, and certain agricultural activities. Alternative 5 would not result in the addition of facilities associated with odors, and as such, long-term operation of the water conveyance facility would not result in objectionable odors.

***CEQA Conclusion*:** Alternative 5 would not result in the addition of major odor producing facilities. Diesel emissions during construction could generate temporary odors, but these would quickly dissipate and cease once construction is completed. Likewise, potential odors generated during asphalt paving would be addressed through mandatory compliance with air district rules and regulations. While tunnel excavation would unearth substantial quantities of RTM, geotechnical tests indicate that soils in the Plan Area have relatively low organic constituents. Moreover, drying and stockpiling of the removed RTM will occur under aerobic conditions, which will further limit any potential decomposition and associated malodorous products. Accordingly, the impact of exposure of sensitive receptors to potential odors would be less than significant. No mitigation is required.

Impact AQ-20: Generation of Criteria Pollutants in the Excess of Federal *De Minimis* Thresholds from Construction and Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: EPA's General Conformity Rule (40 CFR Parts 51 and 93) only applies to Federal actions that are taken in EPA-designated "nonattainment" or "maintenance" areas. Accordingly, as outlined in Section III.A of the General Conformity Rule, "only actions which cause emissions in designated nonattainment and maintenance areas are subject to the regulations". Criteria pollutant emissions resulting from construction and operation of Alternative 5 in the SFNA, SJVAB, and SFBAAB are presented in Table 22-119. Exceedances of the federal *de minimis* thresholds are shown in underlined text.

Sacramento Federal Nonattainment Area

As shown in Table 22-119, implementation of Alternative 5 would exceed the following SFNA federal *de minimis* thresholds:

- NO_X: 2020–2027

NO_X is a precursor to ozone and NO_X is a precursor to PM, for which the SFNA is in nonattainment for the NAAQS. Since project emissions exceed the federal *de minimis* thresholds for NO_X, a general conformity determination must be made to demonstrate that total direct and indirect emissions of NO_X would conform to the appropriate SFNA SIP for each year of construction in which the *de minimis* thresholds are exceeded.

NO_X is also a precursor to PM and can contribute to PM formation. As discussed above, Sacramento County is currently designated maintenance for the PM10 NAAQS and portions of the SVAB are designated nonattainment for the PM2.5 NAAQS. NO_X emissions in excess of 100 tons per year in Sacramento County trigger a secondary PM10 precursor threshold, whereas NO_X emissions in excess of 100 tons per year in the SVAB trigger a secondary PM2.5 precursor threshold. Since NO_X emissions can contribute to PM formation, NO_X emissions in excess of these secondary precursor thresholds could conflict with the applicable PM10 and PM2.5 SIPs. Accordingly, NO_X offsets pursued for the purposes of general conformity must for those years in which NO_X emissions exceed 100 tons occur within the federally designated PM2.5 nonattainment and PM10 maintenance areas of the SVAB.

As shown in Table 22-117, NO_X emissions generated by construction activities in SMAQMD (Sacramento County) would exceed 100 tons per year between 2023 and 2026. The project therefore triggers the secondary PM10 precursor threshold, requiring all NO_X offsets for 2023 through 2026 to occur within Sacramento County.

Given the magnitude of NO_X emissions and the limited geographic scope available for offsets in 2023 through 2026 (Sacramento County), neither Mitigation Measures AQ-1a nor 1b could feasibly reduce NO_X emissions to net zero for the purposes of general conformity.[53] This impact would be adverse. In the event that Alternative 5 is selected as the APA, Reclamation, USFWS, and NMFS would need to demonstrate that conformity is met for NO_X and secondary PM10 formation through a local air quality modeling analysis (i.e., dispersion modeling) or other acceptable methods to ensure project emissions do not cause or contribute to any new violations of the NAAQS or increase the frequency or severity of any existing violations.

Mitigation Measure AQ-1a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-1a under Impact AQ-1 in the discussion of Alternative 1A.

Mitigation Measure AQ-1b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-1b under Impact AQ-1 in the discussion of Alternative 1A.

[53] The secondary PM precursor thresholds are triggered through the General Conformity Regulation (40 CFR 93.153 (a)(1)). Accordingly, confinement of the geographic scope for available offsets only applies to the General Conformity determination and does not influence mitigation feasibility for Impacts AQ-1 or AQ-28.

Table 22-119. Criteria Pollutant Emissions from Construction and Operation of Alternative 5 in Nonattainment and Maintenance Areas of the SFNA, SJVAB, and SFBAAB (tons/year)

Year	Sacramento Federal Nonattainment Area					
	ROG	NO_X[a]	CO[b]	PM10[c]	PM2.5	SO_2
2016	0	0	0	0	0	0
2017	0	0	0	0	0	0
2018	1	9	<1	5	1	<1
2019	2	14	<1	17	2	<1
2020	6	47	<1	25	4	<1
2021	7	69	2	35	6	<1
2022	9	80	3	36	6	<1
2023	13	104	3	43	8	<1
2024	18	138	3	47	9	1
2025	18	132	1	34	7	<1
2026	18	124	1	31	7	<1
2027	13	100	1	33	6	<1
2028	3	18	1	19	3	<1
2029	<1	3	<1	3	<1	<1
ELT	0.06	0.38	0.74	0.12	0.04	<0.01
LLT	0.05	0.32	0.71	0.12	0.03	<0.01
De Minimis	*25*	*25*	*100*	*100*	*100*	*100*
	San Joaquin Valley Air Basin					
Year	ROG	NO_X[a]	CO[b]	PM10	PM2.5	SO_2
2016	0	0	0	2	<1	0
2017	0	0	0	0	0	0
2018	1	5	0	10	1	<1
2019	8	63	0	15	2	<1
2020	15	108	0	29	5	<1
2021	23	168	0	46	7	1
2022	22	144	0	28	5	<1
2023	19	117	0	15	3	<1
2024	18	107	0	14	3	<1
2025	12	71	0	12	2	<1
2026	5	29	0	3	1	<1
2027	<1	0	0	<1	<1	<1
2028	0	0	0	0	0	0
2029	0	0	0	0	0	0
ELT	0.01	0.07	0.13	0.02	<0.01	<0.01
LLT	0.01	0.06	0.12	0.01	<0.01	<0.01
De Minimis	*10*	*10*	*100*	*100*	*100*	*100*

Year	San Francisco Bay Area Air Basin					
	ROG	NO_X	CO[b]	PM10[d]	PM2.5	SO_2
2016	0	0	0	-	0	0
2017	0	0	0	-	0	0
2018	<1	1	<1	-	<1	<1
2019	2	13	<1	-	<1	<1
2020	3	22	1	-	1	<1
2021	4	29	1	-	1	<1
2022	4	32	2	-	2	<1
2023	7	52	3	-	4	<1
2024	11	78	3	-	5	1
2025	7	46	2	-	3	<1
2026	5	35	2	-	3	<1
2027	3	18	1	-	2	<1
2028	<1	1	<1	-	1	<1
2029	<1	<1	<1	-	<1	<1
ELT	0.01	0.08	0.14	-	0.01	<0.01
LLT	0.01	0.07	0.13	-	0.01	<0.01
De Minimis	*100*	*100*	*100*	-	*100*	*100*

[a] NO_X emissions in excess of 100 tons per year within federally designated PM10 and PM2.5 nonattainment or maintenance areas trigger a secondary PM10 and PM2.5 precursor threshold. NO_X emissions in excess of this secondary threshold could conflict with the applicable PM10 and PM2.5 SIPs. Accordingly, NO_X offsets pursued for the purposes of general conformity for those years in which NO_X emissions exceed 100 tons must occur within the federally designated PM2.5 nonattainment and PM10 maintenance areas, as applicable.

[b] The proposed water conveyance facility is located within a federally designated CO attainment area. Accordingly, CO emissions generated by construction of CM1 are not subject to the General Conformity Rule and are excluded from the emissions summary and general conformity analysis (40 CFR Part 51 and 93, Section III.A). Emissions presented in the table are limited those generated by haul trucks, which would occur in federally designated CO maintenance area.

[c] There are no federally designated PM10 maintenance areas in Yolo County. Accordingly, PM10 emissions generated by construction of CM1 in Yolo County are not subject to the General Conformity Rule and are excluded from the emissions summary and general conformity analysis for the SFNA (40 CFR Part 51 and 93, Section III.A). Emissions presented in the table are limited those generated within Sacramento County.

[d] There are no federally designated PM10 nonattainment or maintenance areas in the SFBAAB. Accordingly, PM10 emissions generated by construction of CM1 are not subject to the General Conformity Rule and are excluded from the emissions summary and general conformity analysis (40 CFR Part 51 and 93, Section III.A).

San Joaquin Valley Air Basin

As shown in Table 22-119, implementation of Alternative 5 would exceed the following SJVAB federal *de minimis* thresholds:

- ROG: 2020–2025
- NO_X: 2019–2026

ROG and NO_X are precursors to ozone and NO_X is a precursor to PM, for which the SJVAB is in nonattainment for the NAAQS. Since project emissions exceed the federal *de minimis* threshold for ROG and NO_X, a general conformity determination must be made to demonstrate that total direct and indirect emissions of ROG and NO_X would conform to the appropriate SJVAB SIP for each year of construction in which the *de minimis* thresholds are exceeded.

NO_X is also a precursor to PM and can contribute to PM formation. As discussed above, the SJVAB is currently designated maintenance for the PM10 NAAQS and nonattainment for the PM2.5 NAAQS. NO_X emissions in excess of 100 tons per year trigger a secondary PM precursor threshold, and could conflict with the applicable PM10 and PM2.5 SIPs. As shown in Table 22-119, NO_X emissions generated by construction activities in the SJVAB would exceed 100 tons per year between 2020 and 2024. NO_X offsets pursued for the purposes of general conformity for those years in which NO_X emissions exceed 100 tons must occur within the federally designated PM2.5 nonattainment and PM10 maintenance areas of the SJVAB, which are consistent with the larger nonattainment boundary for ozone.

As shown in Appendix 22E, *General Conformity Determination,* Attachment 22E-1, SJVAPCD confirms that sufficient emissions reduction credits would be available to fully offset ROG and NO_X emissions in excess of the federal *de minimis* thresholds zero through implementation of Mitigation Measures AQ-4a and 4b. Mitigation Measures AQ-4a and 4b will ensure the requirements of the mitigation and offset program are implemented and conformity requirements for ROG and NO_X are met, should Alternative 5 be selected as the APA.

Mitigation Measure AQ-4a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4a under Impact AQ-4 in the discussion of Alternative 1A.

Mitigation Measure AQ-4b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4b under Impact AQ-4 in the discussion of Alternative 1A.

San Francisco Bay Area Air Basin

As shown in Table 22-119, implementation of Alternative 5 would not exceed any of the SFBAAB federal *de minimis* thresholds. Accordingly, a general conformity determination is not required as total direct and indirect emissions would conform to the appropriate SFBAAB SIPs.

CEQA Conclusion: SFNA and SJVAB are classified as nonattainment areas with regard to the ozone NAAQS and the impact of increases in criteria pollutant emissions above the air basin *de minimis* thresholds could conflict with or obstruct implementation of the applicable air quality plans. Since construction emissions in the SFNA and SJVAB would exceed the *de minimis* thresholds for ROG (SJVAB only) and NO_X, this impact would be significant.

Mitigation Measures AQ-4a and AQ-4b would ensure project emissions would not result in an increase in regional ROG or NO_X in the SJVAB. These measures would therefore ensure total direct and indirect ROG and NO_X emissions generated by the project would conform to the appropriate SJVAB SIPs by offsetting the action's emissions in the same or nearby area to net zero. Accordingly, impacts would be less than significant with mitigation in the SJVAB.

Although Mitigation Measures AQ-1a and AQ-1b would reduce NO_X in the SFNA, given the magnitude of NO_X emissions and the limited geographic scope available for offsets (Sacramento County), neither measure could feasibly reduce NO_X emissions to net zero for the purposes of general conformity. This impact would be significant and unavoidable in the SFNA.

Emissions generated within the SFBAAB would not exceed the SFBAAB de minimis thresholds and would therefore conform to the appropriate SFBAAB SIPs. No mitigation is required.

Impact AQ-21: Generation of Cumulative Greenhouse Gas Emissions during Construction of the Proposed Water Conveyance Facility

NEPA Effects: GHG (CO_2, CH_4, N_2O, SF_6, and HFCs) emissions resulting from construction of Alternative 5 are summarized in Table 22-120. Emissions with are presented with implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*) and state mandates to reduce GHG emissions. State mandates include the RPS, LCFS, and Pavley. These mandates do not require additional action on the part of DWR, but will contribute to GHG emissions reductions. For example, Pavley and LCFS will improve the fuel efficiency of vehicles and reduce the carbon content of transportation fuels, respectively. Equipment used to construct the project will therefore be cleaner and less GHG intensive than if the state mandates had not been established.

Table 22-121 summarizes GHG emissions that would be generated in the BAAQMD, SMAQMD, SJVAPCD, and YSAQMD. The table does not include emissions from electricity generation as these emissions would be generated by power plants located throughout the state and the specific location of electricity-generating facilities is unknown (see discussion preceding this impact analysis). Due to the global nature of GHGs, the determination of effects is based on total emissions generated by construction (Table 22-120). GHG emissions presented in Table 22-121 are therefore provided for information purposes only.

Table 22-120. GHG Emissions from Construction of Alternative 5 (metric tons/year)[a]

Year	Equipment and Vehicles (CO_2e)	Electricity (CO_2e)	Concrete Batching (CO_2)	Total CO_2e
2016	0	0	267	267
2017	0	0	0	0
2018	6,010	332	33,217	39,559
2019	33,023	1,853	5,217	40,093
2020	59,229	8,901	32,420	100,550
2021	89,408	23,697	64,302	177,407
2022	94,798	33,276	97,460	225,534
2023	102,793	29,622	95,154	227,569
2024	116,669	30,898	113,843	261,410
2025	83,139	20,844	76,019	180,001
2026	61,893	7,441	18,217	87,552
2027	37,728	1,421	26,272	65,421
2028	9,597	38	5,169	14,804
2029	1,300	1	0	1,301
Total	*695,587*	*158,323*	*567,557*	*1,421,467*

[a] Emissions estimates do not account for GHG flux from land disturbance. Surface and subsurface (e.g., tunneling) activities may oxidize peat soils, releasing GHG emissions. However, recent geotechnical surveys indicated that peat is negligible below 80 feet of depth. The tunnel will be placed below this range and the design adjusted if peat soils are discovered. Peat material encountered during surface excavation for non-tunnel work will be covered with top soil to reduce oxidation when needed.

Values may not total correctly due to rounding.

Table 22-121. GHG Emissions from Construction of Alternative 5 by Air District (metric tons/year)[a]

Year	Equipment and Vehicles (CO_2e)	Concrete Batching (CO_2)[a]	Total CO_2e[b]
SMAQMD	251,094	340,534	591,628
YSAQMD	16,945	0	16,945
SJVAPCD	276,669	113,511	390,181
BAAQMD	150,879	113,511	264,390

[a] Emissions assigned to each air district based on the number of batching plants located in that air district.

[b] Values may not total correctly due to rounding.

Construction of Alternative 5 would generate a total of 1.4 million metric tons of GHG emissions after implementation of environmental commitments and state mandates. This is equivalent to adding 299,000 typical passenger vehicles to the road during construction (U.S. Environmental Protection Agency 2014e). As discussed in section 22.3.2, *Determination of Effects*, any increase in emissions above net zero associated with construction of the BDCP water conveyance features would be adverse. Accordingly, this effect would be adverse. Mitigation Measure AQ-21, which would develop a GHG Mitigation Program to reduce construction-related GHG emissions to net zero, is available address this effect.

***CEQA Conclusion*:** Construction of Alternative 5 would generate a total of 1.4 million metric tons of GHG emissions. This is equivalent to adding 299,000 typical passenger vehicles to the road during construction (U.S. Environmental Protection Agency 2014e). As discussed in section 22.3.2, *Determination of Effects*, any increase in emissions above net zero associated with construction of the BDCP water conveyance features would be significant. Mitigation Measure AQ-21 would develop a GHG Mitigation Program to reduce construction-related GHG emissions to net zero. Accordingly, this impact would be less-than-significant with implementation of Mitigation Measure AQ-21.

Mitigation Measure AQ-21: Develop and Implement a GHG Mitigation Program to Reduce Construction Related GHG Emissions to Net Zero (0)

Please see Mitigation Measure AQ-21 under Impact AQ-21 in the discussion of Alternative 1A.

Impact AQ-22: Generation of Cumulative Greenhouse Gas Emissions from Operation and Maintenance of the Proposed Water Conveyance Facility and Increased Pumping

NEPA Effects: Operation of Alternative 5 would generate direct and indirect GHG emissions. Sources of direct emissions include heavy-duty equipment, on road crew trucks, and employee vehicle traffic. Indirect emissions would be generated predominantly by electricity consumption required for pumping as well as, maintenance, lighting, and other activities.

Table 22-122 summarizes long-term operational GHG emissions associated with operations, maintenance, and increased SWP pumping. Emissions were quantified for both ELT and LLT conditions, although activities would take place annually until project decommissioning. Emissions include state mandates to reduce GHG emissions (described in Impact AQ-21) are presented (there are no BDCP specific operational environmental commitments). Total CO_2e emissions are compared to both the No Action Alternative (NEPA point of comparison) and Existing Conditions (CEQA baseline). As discussed in Section 22.3.1.2, equipment emissions are assumed to be zero under both the No Action Alternative (NEPA point of comparison) and Existing Conditions (CEQA baseline). The equipment emissions presented in Table 22-122 are therefore representative of project impacts for both the NEPA and CEQA analysis.

Table 22-122. GHG Emissions from Operation, Maintenance, and Increased SWP Pumping, Alternative 5 (metric tons/year)

		Electricity CO_{2e}		Total CO_2e	
Condition	Equipment CO_2e	NEPA Point of Comparison	CEQA Baseline	NEPA Point of Comparison	CEQA Baseline
ELT	199	-	20,203	-	20,403
LLT	199	12,377	-9,198	12,576	-8,999

Note: The *NEPA point of comparison* compares total CO_2e emissions after implementation of Alternative 5 to the No Action Alternative, whereas the *CEQA baseline* compares total CO_2e emissions to Existing Conditions.

Table 22-123 summarizes equipment CO_2e emissions that would be generated in the BAAQMD, SMAQMD, and SJVAPCD (no operational emissions would be generated in the YSAQMD). The table does not include emissions from SWP pumping as these emissions would be generated by power plants located throughout the state (see discussion preceding this impact analysis). GHG emissions presented in Table 22-118 are therefore provided for information purposes only.

Table 22-123. Equipment CO_2e Emissions from Operation and Maintenance of Alternative 5 by Air District (metric tons/year)

Air District	ELT	LLT
SMAQMD	147	145
SJVAPCD	25	26
BAAQMD	27	28
Total	199	199

[a] Emissions do not include emissions generated by increased SWP pumping.

SWP Operational and Maintenance GHG Emissions Analysis

Alternative 5 would add approximately 622 GWh[54] of additional net electricity demand to operation of the SWP each year assuming 2060 conditions. Conditions at 2060 (LLT) are used for this analysis because they yield the largest potential additional net electricity requirements and therefore represent the largest potential impact. This 622 GWh is based on assumptions of future conditions and operations and includes all additional energy required to operate the project with BDCP Alternative 5 including any additional energy associated with additional water being moved through the system.

In the CAP, DWR developed estimates of historical, current, and future GHG emissions. Figure 22-19 shows those emissions as they were projected in the CAP and how those emissions projections would change with the additional electricity demands needed to operate the SWP with the addition of BDCP Alternative 5. As shown in Figure 22-19, in 2024, the year BDCP Alternative 5 is projected to go online, DWR total emissions jump from around 912,000 metric tons of CO_2e to around 1.2 million metric tons of CO_2e. This elevated level is still approximately 80,000 metric tons of CO_2e below DWR's designated GHG emissions reduction trajectory (red line, which is the linear interpolation between DWR's 2020 GHG emissions goal and DWR's 2050 GHG emissions goal.) The projection indicates even with the additional electricity required to operate BDCP Alternative 5, existing GHG emissions reduction measures would ensure that DWR's GHG emissions would not exceed the GHG emissions reduction trajectory and that the existing GHG emissions reduction measures would be sufficient to ensure that DWR meets is 2050 emissions reduction goal. The accommodation of over 600 additional GWh of electricity annually, without the need for additional GHG emissions reductions is possible because DWR intentionally designed its strategies in the CAP to allow for some load growth.

The CAP sets forth DWR's plan to manage its activities and operations to achieve its GHG emissions reduction goals. The CAP commits DWR to monitoring its emissions each year and evaluating its emissions every five years to determine whether it is on a trajectory to achieve its GHG emissions reduction goals. If it appears that DWR will not meet the GHG emission reduction goals established in the plan, DWR may make adjustments to existing emissions reduction measures, devise new measures to ensure achievement of the goals, or take other action.

[54] Estimated net energy demand differs slightly from what is presented in Chapter 21, *Energy*. This is because the above analysis includes energy needed for transmission and distribution of water along the Valley String, which is required to enable a comparison with the assumptions in DWR's CAP.

As shown in the analysis above and consistent with the analysis contained in the CAP and associated Initial Study and Negative Declaration for the CAP, BDCP Alternative 5 would not adversely affect DWR's ability to achieve the GHG emissions reduction goals set forth in the CAP. Further, Alternative 5 would not conflict with any of DWR's specific action GHG emissions reduction measures and implements all applicable project level GHG emissions reduction measures as set forth in the CAP. BDCP Alternative 5 is therefore consistent with the analysis performed in the CAP. There would be no adverse effect.

CEQA Conclusion: SWP GHG emissions currently are below 1990 levels and achievement of the goals of the CAP means that total DWR GHG emissions will be reduced to 50% of 1990 levels by 2020 and to 80% of 1990 levels by 2050. The implementation of BDCP Alternative 5 would not affect DWR's established emissions reduction goals or baseline (1990) emissions and therefore would not result in a change in total DWR emissions that would be considered significant. Prior adoption of the CAP by DWR already provides a commitment on the part of DWR to make all necessary modifications to DWR's REPP (as described above) or any other GHG emission reduction measure in the CAP that are necessary to achieve DWR's GHG emissions reduction goals. Therefore no amendment to the approved CAP is necessary to ensure the occurrence of the additional GHG emissions reduction activities needed to account for BDCP-related operational emissions. The effect of BDCP Alternative 5 with respect to GHG emissions is less than cumulatively considerable and therefore less than significant. No mitigation is required.

Impact AQ-23: Generation of Cumulative Greenhouse Gas Emissions from increased CVP Pumping as a Result of Implementation of CM1

NEPA Effects: As previously discussed, DWR's CAP cannot be used to evaluate environmental impacts associated with increased CVP pumping, as emissions associated with CVP are not under DWR's control and are not included in the CAP. Accordingly, GHG emissions resulting from increased CVP energy use are evaluated separately from GHG emissions generated as a result of SWP energy use.

Under Alternative 5, operation of the CVP yields the generation of clean, GHG emissions-free, hydroelectric energy. This electricity is sold into the California electricity market or directly to energy users. Analysis of the No Action Alternative indicates that the CVP generates and will continue to generate all of the electricity needed to operate the CVP system and approximately 3,500 GWh of excess hydroelectric energy that would be sold to energy users throughout California. Implementation of Alternative 5, however, would result in an increase of 57 GWh in the demand for CVP generated electricity, which would result in a reduction of 57 GWh or electricity available for sale from the CVP to electricity users. This reduction in the supply of GHG emissions-free electricity to the California electricity users could result in a potential indirect effect of the project, as these electricity users would have to acquire substitute electricity supplies that may result in GHG emissions (although additional conservation is also a possible outcome as well).

It is unknown what type of power source (e.g., renewable, natural gas) would be substituted for CVP electricity or if some of the lost power would be made up with higher efficiency. Given State mandates for renewable energy and incentives for energy efficiency, it is possible that a considerable amount of this power would be replaced by renewable resources or would cease to be needed as a result of higher efficiency. However, to ensure a conservative analysis, indirect emissions were quantified for the entire quantity of electricity (57 GWh) using the current and future statewide energy mix (adjusted to reflect RPS) (please refer to Appendix 22A, *Air Quality Analysis Methodology,* for additional detail on quantification methods).

Substitution of 57 GWh of electricity with a mix of sources similar to the current statewide mix would result in emissions of 15,868 metric tons of CO_2e; however, under expected future conditions (after full implementation of the RPS), emissions would be 12,330 metric tons of CO_2e.

Use of CVP hydroelectricity to meet increased electricity demand from operation of CVP facilities associated with Alternative 5 would reduce available CVP hydroelectricity to other California electricity users. Substitution of the lost electricity with electricity from other sources could indirectly result in an increase of GHG emissions that is comparable or larger than the level of GHG emissions that trigger mandatory GHG reporting for major facilities. As a result, these emissions could contribute to a cumulatively considerable effect and are therefore adverse. However, these emissions would be caused by dozens of independent electricity users, who had previously bought CVP power, making decisions about different ways to substitute for the lost power. These decisions are beyond the control of Reclamation or any of the other BDCP Lead Agencies. Further, monitoring to determine the actual indirect change in emissions as a result of BDCP actions would not be feasible. In light of the impossibility of predicting where any additional emissions would occur, as well as Reclamation's lack of regulatory authority over the purchasers of power in the open market, no workable mitigation is available or feasible.

***CEQA Conclusion*:** Operation of the CVP is a federal activity beyond the control of any State agency such as DWR, and the power purchases by private entities or public utilities in the private marketplace necessitated by a reduction in available CVP-generated hydroelectric power are beyond the control of the State, just as they are beyond the control of Reclamation. For these reasons, there are no feasible mitigation measures that could reduce this potentially significant indirect impact, which is solely attributable to operations of the CVP and not the SWP, to a less than significant level. This impact is therefore determined to be significant and unavoidable**.**

Impact AQ-24: Generation of Regional Criteria Pollutants from Implementation of CM2–CM11

NEPA Effects: Table 22-29 summarizes potential construction and operational emissions that may be generated by implementation of CM2–CM11. See the discussion of Impact AQ-24 under Alternative 1A.

Criteria pollutants from restoration and enhancement actions could exceed applicable general conformity *de minimis* levels and applicable local thresholds. The effect would vary according to the equipment used in construction of a specific conservation measure, the location, the timing of the actions called for in the conservation measure, and the air quality conditions at the time of implementation; these effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. The effect of increases in emissions during implementation of CM2–CM11 in excess of applicable general conformity *de minimis* levels and air district regional thresholds (Table 22-8) could violate air basin SIPs and worsen existing air quality conditions. Mitigation Measure AQ-24 would be available to reduce this effect, but emissions would still be adverse.

***CEQA Conclusion*:** Construction and operational emissions associated with the restoration and enhancement actions would result in a significant impact if the incremental difference, or increase, relative to Existing Conditions exceeds the applicable local air district thresholds shown in Table 22-8; these effects are expected to be further evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measure AQ-24 would be available to reduce this effect, but may not be sufficient to reduce emissions below applicable air quality management district thresholds (see Table 22-8). Consequently, this impact would be significant and unavoidable.

Mitigation Measure AQ-24: Develop an Air Quality Mitigation Plan (AQMP) to Ensure Air District Regulations and Recommended Mitigation are Incorporated into Future Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-24 under Impact AQ-24 in the discussion of Alternative 1A.

Impact AQ-25: Exposure of Sensitive Receptors to Health Hazards from Localized Particulate Matter, Carbon Monoxide, and Diesel Particulate Matter from Implementation of CM2–CM11

NEPA Effects: The potential for Alternative 5 to expose sensitive receptors increased health hazards from localized PM, CO, and DPM would be similar to Alternative 1A. Activities shown in Table 22-29 with the greatest potential to have short or long-term air quality impacts are also anticipated to have the greatest potential to expose receptors to substantial pollutant concentrations. The effect would vary according to the equipment used, the location and timing of the actions called for in the conservation measure, the meteorological and air quality conditions at the time of implementation, and the location of receptors relative to the emission source. Potential health effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions.

The effect of increases in PM, CO, or DPM (cancer and non-cancer-risk) in excess of applicable air district thresholds (Table 22-8) at receptor locations could result in adverse health impacts. Mitigation Measures AQ-24 and AQ-25 would be available to reduce this effect.

***CEQA Conclusion*:** Construction and operational emissions associated with the restoration and enhancement actions under Alternative 5 would result in a significant impact if PM, CO, or DPM (cancer and non-cancer-risk) concentrations at receptor locations exceed the applicable local air district thresholds shown in Table 22-8; these effects are expected to be further evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measures AQ-24 and AQ-25 would ensure localized concentrations at receptor locations would be below applicable air quality management district thresholds (see Table 22-8). Consequently, this impact would be less than significant.

Mitigation Measure AQ-24: Develop an Air Quality Mitigation Plan (AQMP) to Ensure Air District Regulations and Recommended Mitigation are Incorporated into Future Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-24 under Impact AQ-24 in the discussion of Alternative 1A.

Mitigation Measure AQ-25: Prepare a Project-Level Health Risk Assessment to Reduce Potential Health Risks from Exposure to Localized DPM and PM Concentrations

Please see Mitigation Measure AQ-25 under Impact AQ-25 in the discussion of Alternative 1A.

Impact AQ-26: Creation of Potential Odors Affecting a Substantial Number of People from Implementation of CM2–CM11

NEPA Effects: The potential for Alternative 5 to expose sensitive receptors increased odors would be similar to Alternative 1A. Accordingly, construction activities associated with CM2-CM11 are not anticipated to result in nuisance odors. Similarly, while restored land uses associated with the program have the potential to generate odors from natural processes, the emissions would be similar in origin and magnitude to the existing land use types in the restored area (e.g., managed wetlands). Moreover, specific odor effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Accordingly, odor-related effects associated with CM2–CM11 would not be adverse.

***CEQA Conclusion*:** Alternative 5 would not result in the addition of major odor producing facilities. Diesel emissions during construction could generate temporary odors, but these would quickly dissipate and cease once construction is completed. Increases in wetland, tidal, and upland habitats may increase the potential for odors from natural processes. However, the origin and magnitude of odors would be similar to the existing land use types in the restored area (e.g., managed wetlands). Moreover, specific odor impacts would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Accordingly, the impact of exposure of sensitive receptors to potential odors would be less than significant. No mitigation is required.

Impact AQ-27: Generation of Cumulative Greenhouse Gas Emissions from Implementation of CM2–CM11

NEPA Effects: CM2–CM11 implemented under Alternative 5 would result in local GHG emissions from construction equipment and vehicle exhaust, similar to Alternative 1A. Restoration activities with the greatest potential for emissions include those that break ground and require use of earthmoving equipment. The type of restoration action and related construction equipment use are shown in Table 22-29. Implementing CM2–CM11 would also affect long-term sequestration rates through land use changes, such as conversion of agricultural land to wetlands, inundation of peat soils, drainage of peat soils, and removal or planting of carbon-sequestering plants.

Without additional information on site-specific characteristics associated with each of the restoration components, a complete assessment of GHG flux from CM2–CM11 is currently not possible. The effect of carbon sequestration and CH_4 generation would vary by land use type, season, and chemical and biological characteristics; these effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measures AQ-24 and AQ-27 would be available to reduce this effect. However, due to the potential for increases in GHG emissions from construction and land use change, this effect would be adverse.

***CEQA Conclusion*:** The restoration and enhancement actions under Alternative 5 could result in a significant impact if activities are inconsistent with applicable GHG reduction plans, do not contribute to a lower carbon future, or generate excessive emissions, relative to other projects throughout the state. These effects are expected to be further evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measures AQ-25 and AQ-27 would be available to reduce this impact, but may not be sufficient to reduce to a less-than-significant level. Consequently, this impact would be significant and unavoidable.

Mitigation Measure AQ-25: Develop an Air Quality Mitigation Plan (AQMP) to Ensure Air District Regulations and Recommended Mitigation are Incorporated into Future Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-25 under Impact AQ-25 in the discussion of Alternative 1A.

Mitigation Measure AQ-27: Prepare a Land Use Sequestration Analysis to Quantify and Mitigate (as Needed) GHG Flux Associated with Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-27 under Impact AQ-27 in the discussion of Alternative 1A.

22.3.3.11 Alternative 6A—Isolated Conveyance with Pipeline/Tunnel and Intakes 1–5 (15,000 cfs; Operational Scenario D)

A total of five intakes would be constructed under Alternative 6A. For the purposes of this analysis, it was assumed that Intakes 1–5 (on the east bank of the Sacramento River) would be constructed under Alternative 6A. Under this alternative, an intermediate forebay would also be constructed, and the conveyance facility would be a buried pipeline and tunnels (Figures 3-2 and 3-13 in Chapter 3, *Description of Alternatives*).

Construction and operation of Alternative 6A would require the use of electricity, which would be supplied by the California electrical grid. Power plants located throughout the state supply the grid with power, which will be distributed to the Study area to meet project demand. Power supplied by statewide power plants will generate criteria pollutants. Because these power plants are located throughout the state, criteria pollutant emissions associated with Alternative 6A electricity demand cannot be ascribed to a specific air basin or air district within the Study area. Criteria pollutant emissions from electricity consumption are therefore provided for informational purposes only and are not included in the impact conclusion.

Construction activity required for Alternative 6A was assumed to equal activity required for Alternative 1A. Construction emissions generated by Alternative 1A would therefore be representative of emissions generated by Alternative 6A. Refer to Table 22-11 for a summary of criteria pollutants during construction (years 2016 through 2029) of Alternative 1A that are applicable to this alternative. Operational emissions would be different from Alternative 1A and are provided in Table 22-124. Negative values represent an emissions benefit, relative to the No Action Alternative or Existing Conditions.

Table 22-124. Criteria Pollutant Emissions from Electricity Consumption: Net Project Operations, Alternative 6A (tons/year) [a,b]

Year	Analysis	ROG	CO	NO_X	PM10	PM2.5[c]	SO_2
ELT	CEQA	-1	-14	-189	-16	-16	-80
LLT	NEPA	-1	-7	-95	-8	-8	-40
LLT	CEQA	-2	-19	-260	-22	-22	-110

NEPA = Compares criteria pollutant emissions after implementation of Alternative 6A to the No Action Alternative.

CEQA = Compares criteria pollutant emissions after implementation of Alternative 6A to Existing Conditions.

[a] Emissions assume implementation of RPS (see Appendix 22A, *Air Quality Analysis Methodology*). Power plants that generate electricity for the proposed project would be subject to local air district permitting requirements, including standards to implement BACT to reduce criteria pollutant emissions.

[b] Because GHG emissions are cumulative (see Section 22.3.2.1) and not evaluated at the local air basin or air district level, they are discussed in Impacts AQ-21 and AQ-22. The GHG analysis for SWP power utilizes actual and forecasted GHG emissions rates for the SWP system, which differs slightly from the above analysis. Statewide grid average emission factors were utilized for the above analysis as criteria pollutant emission factors for SWP were unavailable. Please also note that the above analysis does not account for additional renewable energy that will be procured through modifications to DWR's REPP (see Impact AQ-22). Accordingly, the emissions results presented above represent a conservative assessment of potential criteria pollutant emissions.

[c] Emission factors for PM2.5 are currently unavailable. Consequently, PM2.5 emissions were assumed to equal PM10 emissions. Because PM2.5 represents a fraction of PM10, this approach represents a conservative assessment of PM2.5 emissions from electricity consumption.

Impact AQ-1: Generation of Criteria Pollutants in Excess of the SMAQMD Regional Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: Construction activity required for Alternative 6A was assumed to equal activity required for Alternative 1A. Emissions generated by Alternative 1A would therefore be representative of emissions generated by Alternative 6A. As shown in Table 22-12, emissions would exceed SMAQMD's daily NO_X threshold, even with implementation of environmental commitments. Since NO_X is a precursor to ozone and PM, exceedances of SMAQMD's daily NO_X threshold could impact both regional ozone and PM formation, which could worsen regional air quality and air basin attainment of the NAAQS and CAAQS.

While equipment could operate at any work area identified for this alternative, the highest level of NO_X and fugitive dust emissions in the SMAQMD are expected to occur at those sites where the duration and intensity of construction activities would be greatest. This includes all intake and intake pumping plant sites along the east bank of the Sacramento River, as well as the intermediate forebay (and pumping plant) site west of South Stone Lake and east of the Sacramento River. See the discussion of Impact AQ-1 under Alternative 1A.

Environmental commitments will reduce construction-related emissions; however, as shown in Table 22-12, NO_X emissions would still exceed the air district threshold identified in Table 22-8 and would result in an adverse effect to air quality. Mitigation Measures AQ-1a and AQ-1b would be available to reduce NO_X emissions, and would thus address regional effects related to secondary ozone and PM formation.

CEQA Conclusion: NO_X emissions generated during construction would exceed SMAQMD threshold identified in Table 22-8. Since NO_X is a precursor to ozone and PM, exceedances of SMAQMD's daily NO_X threshold could impact both regional ozone and PM formation. SMAQMD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS or NAAQS. The impact of generating NO_X emissions in excess of local air district thresholds would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. This would be a significant impact. Mitigation Measures AQ-1a and AQ-1b would be available to reduce NO_X emissions to a less-than-significant level by offsetting emissions to quantities below SMAQMD CEQA thresholds (see Table 22-8).

Mitigation Measure AQ-1a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-1a under Impact AQ-1 in the discussion of Alternative 1A.

Mitigation Measure AQ-1b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-1b under Impact AQ-1 in the discussion of Alternative 1A.

Impact AQ-2: Generation of Criteria Pollutants in Excess of the YSAQMD Regional Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: Construction activity required for Alternative 6A within the YSAQMD was assumed to equal activity required for Alternative 1A. Emissions generated by Alternative 1A would therefore be representative of emissions generated by Alternative 6A. As shown in Table 22-12, emissions would exceed YSAQMD's NO_X and PM10 thresholds, even with implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*).

Since NO_X is a precursor to ozone and PM, exceedances of SMAQMD's daily NO_X threshold could impact both regional ozone and PM formation, which could worsen regional air quality and air basin attainment of the NAAQS and CAAQS. Similarly, exceedances of YSAQMD's PM10 threshold could impede attainment of the NAAQS and CAAQS for PM10. All emissions generated within YSAQMD are a result of haul truck movement for equipment and material delivery.

Environmental commitments outlined in Appendix 3B, *Environmental Commitments,* will reduce construction-related emissions; however, as shown in Table 22-12, NO_X and PM10 emissions would still exceed the applicable YSAQMD thresholds identified in Table 22-8 and result in an adverse regional effect to air quality. Mitigation Measures AQ-1a and AQ-1b are available to reduce NO_X and PM10 emissions, and would thus address regional effects related to secondary ozone and PM formation.

CEQA Conclusion: Emissions of NO_X and PM10 generated during construction would exceed YSAQMD's regional thresholds identified in Table 22-8. Since NO_X is a precursor to ozone and NO_X is a precursor to PM, exceedances of YSAQMD's NO_X threshold could impact both regional ozone and

PM formation, which could worsen regional air quality and air basin attainment of the NAAQS and CAAQS. Similarly, exceedances of YSAQMD's PM10 threshold could impede attainment of the NAAQS and CAAQS for PM10. YSAQMD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS or NAAQS. The impact of generating NO_X and PM10 in excess of local air district regional thresholds would therefore violate applicable air quality standards in the study area and could contribute to or worsen an existing air quality conditions. This would be a significant impact. Mitigation Measures AQ-1a and AQ-1b would be available to reduce NO_X and PM10 emissions to a less-than-significant level by offsetting emissions to quantities below YSAQMD CEQA thresholds (see Table 22-8).

Mitigation Measure AQ-1a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-1a under Impact AQ-1 in the discussion of Alternative 1A.

Mitigation Measure AQ-1b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-1b under Impact AQ-1 in the discussion of Alternative 1A.

Impact AQ-3: Generation of Criteria Pollutants in Excess of the BAAQMD Regional Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: Construction activity required for Alternative 6A was assumed to equal activity required for Alternative 1A. Emissions generated by Alternative 1A would therefore be representative of emissions generated by Alternative 6A. As shown in Table 22-12, emissions would exceed BAAQMD's daily thresholds for ROG and NO_X, even with implementation of environmental commitments. All other pollutants would be below air district thresholds and therefore would not result in an adverse air quality effect.

Since ROG and NO_X are precursors to ozone and NO_X is a precursor to PM, exceedances of BAAQMD's ROG and NO_X thresholds could impact both regional ozone and PM formation, which could worsen regional air quality and air basin attainment of the NAAQS and CAAQS.

While equipment could operate at any work area identified for this alternative, the highest level of ROG and NO_X emissions in the BAAQMD are expected to occur at those sites where the duration and intensity of construction activities would be greatest, including the site of the Byron Tract Forebay adjacent to and south of Clifton Court Forebay.

Environmental commitments outlined in Appendix 3B, *Environmental Commitments,* will reduce construction-related emissions; however, as shown in Table 22-12, ROG and NO_X emissions would still exceed the applicable air district thresholds identified in Table 22-8 and would result in an adverse effect to air quality. Mitigation Measures AQ-3a and AQ-3b would be available to address this effect.

CEQA Conclusion**:** Emissions of ROG and NO_X precursors generated during construction would exceed BAAQMD thresholds identified in Table 22-8. Since ROG and NO_X are precursors to ozone and NO_X is a precursor to PM, exceedances of BAAQMD's ROG and NO_X thresholds could impact both regional ozone and PM formation. BAAQMD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS or NAAQS. The impact of generating ROG and NO_X emissions in excess of local air district thresholds would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. This would be a significant impact. Mitigation Measures AQ-3a and AQ-3b would be available to reduce ROG and NO_X emissions to a less-than-significant level by offsetting emissions to quantities below BAAQMD CEQA thresholds (see Table 22-8).

Mitigation Measure AQ-3a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within BAAQMD/SFBAAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable BAAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-3a under Impact AQ-3 in the discussion of Alternative 1A.

Mitigation Measure AQ-3b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the BAAQMD/SFBAAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable BAAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-3b under Impact AQ-3 in the discussion of Alternative 1A.

Impact AQ-4: Generation of Criteria Pollutants in Excess of the SJVAPCD Regional Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: Construction activity required for Alternative 6A was assumed to equal activity required for Alternative 1A. Emissions generated by Alternative 1A would therefore be representative of emissions generated by Alternative 6A. As shown in Table 22-12, emissions would exceed SJVAPCD's ROG, NO_X, and PM10 thresholds, even with implementation of environmental commitments. All other pollutants would be below air district thresholds and therefore would not result in an adverse air quality effect.

Since ROG and NO_X are precursors to ozone and NO_X is a precursor to PM, exceedances of SJVAPCD's ROG and NO_X thresholds could impact both regional ozone and PM formation, which could worsen regional air quality and air basin attainment of the NAAQS and CAAQS. Similarly, exceedances of SJVAPCD's PM10 threshold could impede attainment of the NAAQS and CAAQS for PM10.

While equipment could operate at any work area identified for this alternative, the highest level of NO_X, and PM10 emissions in the SJVAPCD is expected to occur at those sites where the duration and intensity of construction activities would be greatest. This includes all temporary and permanent utility sites, as well as all construction sites along the pipeline/tunnel conveyance alignment. For a map of the proposed tunnel alignment, see Mapbook Figure M3-1.

Environmental commitments outlined in Appendix 3B, *Environmental Commitments,* will reduce construction-related emissions; however, as shown in Table 22-12, NO_X, and PM10 emissions would still exceed the applicable air district thresholds identified in Table 22-8 and would result in an adverse effect to air quality. Mitigation Measures AQ-4a and AQ-4b are available to reduce ROG, NO_X, and PM10 emissions, and would thus address regional effects related to secondary ozone and PM formation.

CEQA Conclusion**:** Emissions of ROG, NO_X, and PM10 generated during construction would regional SJVAPCD's annual significance threshold identified in Table 22-8. Since ROG and NO_X are precursors to ozone and NO_X is a precursor to PM, exceedances of SJVAPCD's ROG and NO_X thresholds could impact both regional ozone and PM formation, which could worsen regional air quality and air basin attainment of the NAAQS and CAAQS. Similarly, exceedances of SJVAPCD's PM10 threshold could impede attainment of the NAAQS and CAAQS for PM10. SJVAPCD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS or NAAQS. The impact of generating ROG, NO_X, and PM10 emissions in excess of local air district thresholds would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. This would be a significant impact. Mitigation Measures AQ-4a and AQ-4b would be available to reduce ROG, NO_X, and PM10 emissions to a less-than-significant level by offsetting emissions to quantities below SJVAPCD CEQA thresholds (see Table 22-8).

Mitigation Measure AQ-4a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4a under Impact AQ-4 in the discussion of Alternative 1A.

Mitigation Measure AQ-4b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4b under Impact AQ-4 in the discussion of Alternative 1A.

Impact AQ-5: Generation of Criteria Pollutants in Excess of the SMAQMD Regional Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance activities in SMAQMD required for Alternative 6A were assumed to equal activities required for Alternative 1A. Emissions generated by Alternative 1A would therefore be representative of emissions generated by Alternative 6A. As shown in Table 22-13, emissions would not exceed SMAQMD's regional thresholds of significance and there would be no adverse effect. See the discussion of Impact AQ-5 under Alternative 1A.

CEQA Conclusion**:** Emissions generated during operation and maintenance activities would not exceed SMAQMD regional thresholds for criteria pollutants. SMAQMD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS or NAAQS. The impact of generating emissions in excess of local air district would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Because project operations would not exceed SMAQMD regional thresholds, the impact would be less than significant. No mitigation is required.

Impact AQ-6: Generation of Criteria Pollutants in Excess of the YSAQMD Regional Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Alternative 6A would not involve the construction of any permanent features in the YSAQMD that would require routine operations and maintenance. No operational emissions would be generated in the YSAQMD. Consequently, operation of Alternative 6A would neither exceed the YSAQMD thresholds of significance nor result in an adverse effect on air quality.

***CEQA Conclusion*:** No operational or maintenance emissions generated by the alternative would occur in YSAQMD and, therefore, YSAQMD's regional thresholds would not be exceeded (see Table 22-8). This impact would be less than significant. No mitigation is required.

Impact AQ-7: Generation of Criteria Pollutants in Excess of the BAAQMD Regional Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance activities in BAAQMD required for Alternative 6A were assumed to equal activities required for Alternative 1A. Emissions generated by Alternative 1A would therefore be representative of emissions generated by Alternative 6A. As shown in Table 22-13, emissions would not exceed BAAQMD's regional thresholds of significance and there would be no adverse effect. See the discussion of Impact AQ-7 under Alternative 1A.

***CEQA Conclusion*:** Emissions generated during operation and maintenance activities would not exceed BAAQMD thresholds for criteria pollutants. BAAQMD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS or NAAQS. The impact of generating emissions in excess of local air district thresholds would violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Because project operations would not exceed BAAQMD regional thresholds, the impact would be less than significant. No mitigation is required.

Impact AQ-8: Generation of Criteria Pollutants in Excess of the SJVAPCD Regional Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance activities in SJVAPCD required for Alternative 6A were assumed to equal activities required for Alternative 1A. Emissions generated by Alternative 1A would therefore be representative of emissions generated by Alternative 6A. As shown in Table 22-13, emissions would not exceed SJVAPCD's regional thresholds of significance and there would be no adverse effect. See the discussion of Impact AQ-8 under Alternative 1A.

***CEQA Conclusion*:** Emissions generated during operation and maintenance activities would not exceed SJVAPCD's thresholds of significance. SJVAPCD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS or NAAQS. The impact of generating emissions in excess of local air district thresholds would violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Because project operations would not exceed SJVAPCD regional thresholds, the impact would be less than significant. No mitigation is required.

Impact AQ-9: Exposure of Sensitive Receptors to Health Hazards from Localized Particulate Matter in Excess of SMAQMD's Health-Based Concentration Thresholds

NEPA Effects: Construction activity required for Alternative 6A within the SMAQMD was assumed to equal activity required for Alternative 1A. Emissions and associated health risks from exposure to localized PM under Alternative 1A would therefore be representative of emissions and health risks generated by Alternative 6A.

As shown in Table 22-14, concentrations of annual PM10 and PM2.5 would be below the SMAQMD's significance thresholds. However, concentrations of PM10 would exceed SMAQMD's 24-hour PM10 threshold, even with implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*). Receptors exposed to PM10 concentrations in excess of SMAQMD's threshold could experience increased risk for adverse human health effects. Mitigation Measure AQ-9 is available to address this effect.

***CEQA Conclusion*:** Respirable particulates pose a human health hazard by bypassing the defenses within the mucous ciliary system and entering deep lung tissue. Construction of Alternative 6A would result in the short-term exposure of receptors to PM10 concentrations that exceed SMAQMD threshold. This would be a significant impact. Mitigation Measure AQ-9 outlines a tiered strategy to reduce PM10 concentrations and public exposure to a less-than-significant level.

Mitigation Measure AQ-9: Implement Measures to Reduce Re-Entrained Road Dust and Receptor Exposure to PM2.5 and PM10

Please see Mitigation Measure AQ-9 under Impact AQ-9 in the discussion of Alternative 1A.

Impact AQ-10: Exposure of Sensitive Receptors to Health Hazards from Localized Particulate Matter in Excess of YSAQMD's Health-Based Concentration Thresholds

NEPA Effects: Construction activity required for Alternative 6A within the YSAQMD was assumed to equal activity required for Alternative 1A. Emissions and associated health risks from exposure to localized PM under Alternative 1A would therefore be representative of emissions and health risks generated by Alternative 6A. As shown previously in Table 22-15, concentrations of particulate matter would not exceed YSAQMD's 24-hour and annual PM10 and PM2.5 thresholds and consequently would not result in an adverse effect to human health.

***CEQA Conclusion*:** Respirable particulates pose a human health hazard by bypassing the defenses within the mucous ciliary system and entering deep lung tissue. Construction of Alternative 6A would result in PM2.5 and PM10 concentrations at receptor locations that are below the significance thresholds established by the YSAQMD. As such, localized particulate matter concentrations at analyzed receptors would not result in significant human health impacts. No mitigation is required.

Impact AQ-11: Exposure of Sensitive Receptors to Health Hazards from Localized Particulate Matter in Excess of BAAQMD's Health-Based Concentration Thresholds

NEPA Effects: Construction activity required for Alternative 6A within the BAAQMD was assumed to equal activity required for Alternative 1A. Emissions and associated health risks from exposure to localized PM under Alternative 1A would therefore be representative of emissions and health risks generated by Alternative 6A. As shown in Table 22-16, concentrations of particulate matter would not exceed BAAQMD's annual PM2.5 threshold and consequently would not result in an adverse effect to human health.

***CEQA Conclusion*:** Respirable particulates pose a human health hazard by bypassing the defenses within the mucous ciliary system and entering deep lung tissue. Construction of Alternative 6A would result in PM2.5 concentrations at receptor locations that are below the significance

thresholds established by the BAAQMD. As such, localized particulate matter concentrations at analyzed receptors would not result in significant human health impacts. No mitigation is required.

Impact AQ-12: Exposure of Sensitive Receptors to Health Hazards from Localized Particulate Matter in Excess of SJVAPCD's Health-Based Concentration Thresholds

NEPA Effects: Construction activity required for Alternative 6A within the SJVAPCD was assumed to equal activity required for Alternative 1A. Emissions and associated health risks from exposure to localized PM under Alternative 1A would therefore be representative of emissions and health risks generated by Alternative 6A.

As shown in Table 22-17, with the exception of 24-hour PM10, maximum predicted PM2.5 and PM10 concentrations are less than SJVAPCD's adopted thresholds. Concentrations of PM10 would exceed SJVAPCD's 24-hour PM10 threshold, even with implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*). Receptors exposed to PM10 concentrations in excess of SMAQMD's threshold could experience increased risk for adverse human health effects. Mitigation Measure AQ-9 is available to address this effect.

CEQA Conclusion**:** Respirable particulates pose a human health hazard by bypassing the defenses within the mucous ciliary system and entering deep lung tissue. Construction of Alternative 6A would result in the short-term exposure of receptors to PM10 concentrations that exceed SJVAPCD threshold. This would be a significant impact. Mitigation Measure AQ-9 outlines a tiered strategy to reduce PM10 concentrations and public exposure to a less-than-significant level.

Mitigation Measure AQ-9: Implement Measures to Reduce Re-Entrained Road Dust and Receptor Exposure to PM2.5 and PM10

Please see Mitigation Measure AQ-9 under Impact AQ-9 in the discussion of Alternative 1A.

Impact AQ-13: Exposure of Sensitive Receptors to Health Hazards from Localized Carbon Monoxide

NEPA Effects: Construction activity required for Alternative 6A would be similar to activity required for Alternative 1A. Accordingly, the potential for Alternative 6A to result in CO hot-spots during construction would be the same as Alternative 6A. Given that construction activities typically do not result in CO hot-spots, onsite concentrations must comply with OSHA standards, and CO levels dissipate as a function of distance, equipment-generated CO emissions (see Table 22-12) are not anticipated to result in adverse health hazards to sensitive receptors. Refer to Impact AQ-13 under Alternative 1A.

Traffic associated with construction may contribute to increase roadway congestion, which could lead to conditions conducive to CO hot-spot formation. As shown in Table 19-8, the highest peak hour traffic volumes under BPBGPP—12,567 vehicles per hour—would occur on westbound Interstate 80 between Suisun Valley Road and State Route 12. This is about half of the congested traffic volume modeled by BAAQMD (24,000 vehicles per hour) that would be needed to contribute to a localized CO hot-spot, and less than half of the traffic volume modeled by SMAQMD (31,600 vehicles per hour). Accordingly, construction traffic is not anticipated to result in adverse health hazards to sensitive receptors.

CEQA Conclusion**:** Continuous engine exhaust may elevate localized CO concentrations. Receptors exposed to these CO "hot-spots" may have a greater likelihood of developing adverse health effects.

Construction sites are less likely to result in localized CO hot-spots due to the nature of construction activities (Sacramento Metropolitan Air Quality Management District 2014), which normally utilize diesel-powered equipment for intermittent or short durations. Moreover, construction sites must comply with the OSHA CO exposure standards for onsite workers. Accordingly, given that construction activities typically do not result in CO hot-spots, onsite concentrations must comply with OSHA standards, and CO levels dissipate as a function of distance, equipment-generated CO emissions are not anticipated to result in significant health hazards to sensitive receptors. Similarly, peak-hour construction traffic on local roadways would not exceed BAAQMD's or SMAQMD's conservative screening criteria for the formation potential CO hot-spots. This impact would be less than significant. No mitigation is required.

Impact AQ-14: Exposure of Sensitive Receptors to Health Hazards from Diesel Particulate Matter in Excess of SMAQMD's Chronic Non-Cancer and Cancer Risk Thresholds

NEPA Effects: Construction activity required for Alternative 6A within the SMAQMD was assumed to equal activity required for Alternative 1A. Emissions and associated health risks from exposure to localized DPM under Alternative 1A would therefore be representative of emissions and health risks generated by Alternative 6A. As shown in Table 22-18, Alternative 1A would not exceed the SMAQMD's thresholds for chronic non-cancer hazard or cancer risk. Therefore, this alternative's effect of exposure of sensitive receptors to DPM emissions and their health hazards during construction would not be adverse.

***CEQA Conclusion*:** DPM generated during construction poses inhalation-related chronic non-cancer hazard and cancer risk if adjacent receptors are exposed to significant concentrations for prolonged durations. The DPM generated during Alternative 6A construction would not exceed the SMAQMD's chronic non-cancer hazard or cancer risk threshold. Therefore, this impact would be less than significant. No mitigation is required.

Impact AQ-15: Exposure of Sensitive Receptors to Health Hazards from Diesel Particulate Matter in Excess of YSAQMD's Chronic Non-Cancer and Cancer Risk Thresholds

NEPA Effects: Construction activity required for Alternative 6A within the YSAQMD was assumed to equal activity required for Alternative 1A. Emissions and associated health risks from exposure to localized DPM under Alternative 1A would therefore be representative of emissions and health risks generated by Alternative 6A. As shown in Table 22-19, Alternative 1A would not exceed the YSAQMD's chronic non-cancer or cancer thresholds and, thus, would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to DPM emissions and their health hazards during construction would not be adverse.

***CEQA Conclusion*:** DPM generated during construction poses inhalation-related chronic non-cancer hazard and cancer risk if adjacent receptors are exposed to significant concentrations for prolonged durations. The DPM generated during Alternative 6A construction would not exceed the YSAQMD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this impact for DPM emissions would be less than significant. No mitigation is required.

Impact AQ-16: Exposure of Sensitive Receptors to Health Hazards from Diesel Particulate Matter in Excess of BAAQMD's Chronic Non-Cancer and Cancer Risk Thresholds

NEPA Effects: Construction activity required for Alternative 6A within the BAAQMD was assumed to equal activity required for Alternative 1A. Emissions and associated health risks from exposure to localized DPM under Alternative 1A would therefore be representative of emissions and health risks generated by Alternative 6A. As shown in Table 22-20, Alternative 1A would not exceed the BAAQMD's thresholds for chronic non-cancer hazard; however, it would exceed BAAQMD's cancer risk threshold. Therefore, this alternative's effect of exposure of sensitive receptors to DPM-related health hazards during construction would be adverse.

Mitigation Measure AQ-16 would be available to reduce exposure to substantial cancer risk by relocating affected receptors. Although Mitigation Measure AQ-16 would reduce the severity of this effect, the BDCP proponents are not solely responsible for implementation of the measure. If a landowner chooses not to accept DWR's offer of relocation assistance, an adverse effect in the form excess cancer risk above air district thresholds would occur. Therefore, this effect would be adverse. If, however, all landowners accept DWR's offer of relocation assistance, effects would not be adverse.

***CEQA Conclusion*:** DPM generated during construction poses inhalation-related chronic non-cancer hazard and cancer risk if adjacent receptors are exposed to significant concentrations for prolonged durations. The DPM generated during Alternative 6A construction would not exceed the BAAQMD's chronic non-cancer hazard threshold; however, it would exceed the BAAQMD's cancer thresholds. Therefore, this impact would be significant.

Mitigation Measure AQ-16 would be available to reduce exposure to substantial cancer risk by relocating affected receptors. Although Mitigation Measure AQ-16 would reduce the severity of this effect, the BDCP proponents are not solely responsible for implementation of the measure. If a landowner chooses not to accept DWR's offer of relocation assistance, a significant impact in the form excess cancer risk above air district thresholds would occur. Therefore, this effect would be significant and unavoidable. If, however, all landowners accept DWR's offer of relocation assistance, the impact would be less than significant.

Mitigation Measure AQ-16: Relocate Sensitive Receptors to Avoid Excess Cancer Risk

Please see Mitigation Measure AQ-16 under Impact AQ-16 in the discussion of Alternative 1A.

Impact AQ-17: Exposure of Sensitive Receptors to Health Hazards from Diesel Particulate Matter in Excess of SJVAPCD's Chronic Non-Cancer and Cancer Risk Thresholds

NEPA Effects: Construction activity required for Alternative 6A within the SJVAPCD was assumed to equal activity required for Alternative 1A. Emissions and associated health risks for Alternative 1A would therefore be representative of emissions and health risks generated by Alternative 6A. As shown in Table 22-21, Alternative 6A would not exceed the SJVAPCD's chronic non-cancer or cancer thresholds and, thus, would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to DPM emissions and their health hazards during construction would not be adverse.

***CEQA Conclusion*:** DPM generated during construction poses inhalation-related chronic non-cancer hazard and cancer risk if adjacent receptors are exposed to significant concentrations for prolonged durations. The DPM generated during Alternative 6A construction would not exceed the SJVAPCD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this impact for DPM emissions would be less than significant. No mitigation is required.

Impact AQ-18: Exposure of Sensitive Receptors to *Coccidioides immitis* (Valley Fever)

***NEPA Effects*:** As discussed under Alternative 1A, earthmoving activities during construction could release *C. immitis* spores if filaments are present and other soil chemistry and climatic conditions are conducive to spore development. Receptors adjacent to the construction area may therefore be exposed to increase risk of inhaling *C. immitis* spores and subsequent development of Valley Fever. Dust-control measures are the primary defense against infection (United States Geological Survey 2000). Implementation of advanced air-district recommended fugitive dust controls outlined in Appendix 3B, *Environmental Commitments*, would avoid dusty conditions and reduce the risk of contracting Valley Fever through routine watering and other controls. Therefore, this alternative's effect of exposure of sensitive receptors to increased Valley Fever risk during construction would not be adverse.

***CEQA Conclusion*:** Construction of the water conveyance facility would involve earthmoving activities that could release *C. immitis* spores if filaments are present and other soil chemistry and climatic conditions are conducive to spore development. Receptors adjacent to the construction area may therefore be exposed to increase risk of inhaling *C. immitis* spores and subsequent development of Valley Fever. Implementation of air-district recommended fugitive dust controls outlined in Appendix 3B, *Environmental Commitments*, would avoid dusty conditions and reduce the risk of contracting Valley Fever through routine watering and other controls. Therefore, this impact would be less than significant. No mitigation is required.

Impact AQ-19: Creation of Potential Odors Affecting a Substantial Number of People during Construction or Operation of the Proposed Water Conveyance Facility

NEPA Effects: As discussed under Alternative 1A, odors from construction activities would be localized and generally confined to the immediate area surrounding the construction site. Moreover, odors would be temporary and localized, and they would cease once construction activities have been completed. Thus, it is not anticipated that construction of CM1 would create objectionable odors from construction equipment or asphalt paving.

Construction of the water conveyance facility would require removal of subsurface material during tunnel excavation and sediment removal. As discussed under Alternative 1A, geotechnical tests indicate that VOC levels in Plan Area soils are below the method detection limits, indicating that organic decay of exposed RTM and sediment will be relatively low (URS 2014). Moreover, drying and stockpiling of the removed RTM and sediment will occur under aerobic conditions, which will further limit any potential decomposition and associated malodorous products. Accordingly, it is not anticipated that tunnel and sediment excavation would create objectionable odors.

Typical facilities known to produce odors include landfills, wastewater treatment plants, food processing facilities, and certain agricultural activities. Alternative 6A would not result in the addition of facilities associated with odors, and as such, long-term operation of the water conveyance facility would not result in objectionable odors.

CEQA Conclusion: Alternative 6A would not result in the addition of major odor producing facilities. Diesel emissions during construction could generate temporary odors, but these would quickly dissipate and cease once construction is completed. Likewise, potential odors generated during asphalt paving would be addressed through mandatory compliance with air district rules and regulations. While tunnel excavation would unearth substantial quantities of RTM, geotechnical tests indicate that soils in the Plan Area have relatively low organic constituents. Moreover, drying and stockpiling of the removed RTM will occur under aerobic conditions, which will further limit any potential decomposition and associated malodorous products. Accordingly, the impact of exposure of sensitive receptors to potential odors during construction would be less than significant. No mitigation is required.

Impact AQ-20: Generation of Criteria Pollutants in the Excess of Federal *De Minimis* Thresholds from Construction and Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: As discussed above, emissions generated by Alternative 1A within the SFNA, SJVAB, and SFBAAB would be representative of emissions generated by Alternative 6A (see Table 22-23).

Sacramento Federal Nonattainment Area

As shown in Table 22-23, implementation of Alternative 1A (and thus Alternative 6A), would exceed the following SFNA federal *de minimis* thresholds:

- ROG: 2023-2027
- NO_X: 2018-2028
- PM10: 2023-2024

ROG and NO_X are precursors to ozone and NO_X is a precursor to PM, for which the SFNA is in nonattainment for the NAAQS. Sacramento County is also a maintenance area for the PM10 NAAQS. Since project emissions exceed the federal *de minimis* thresholds for ROG, NO_X, and PM10, a general conformity determination must be made to demonstrate that total direct and indirect emissions of ROG, NO_X, and PM10would conform to the appropriate SFNA SIP for each year of construction in which the *de minimis* thresholds are exceeded.

NO_X is also a precursor to PM and can contribute to PM formation. As discussed above, Sacramento County is currently designated maintenance for the PM10 NAAQS and portions of the SVAB are designated nonattainment for the PM2.5 NAAQS. NO_X emissions in excess of 100 tons per year in Sacramento County trigger a secondary PM10 precursor threshold, whereas NO_X emissions in excess of 100 tons per year in the SVAB trigger a secondary PM2.5 precursor threshold. Since NO_X emissions can contribute to PM formation, NO_X emissions in excess of these secondary precursor thresholds could conflict with the applicable PM10 and PM2.5 SIPs. Accordingly, NO_X offsets pursued for the purposes of general conformity must for those years in which NO_X emissions exceed 100 tons occur within the federally designated PM2.5 nonattainment and PM10 maintenance areas of the SVAB.

As shown in Table 22-12, NO_X emissions generated by construction activities in SMAQMD (Sacramento County) would exceed 100 tons per year between 2022 and 2027. The project therefore triggers the secondary PM10 precursor threshold, requiring all NO_X offsets for 2022 through 2027 to occur within Sacramento County. The project also triggers the secondary PM2.5 precursor threshold in 2021, requiring all NO_X offsets for 2021 to occur within the federally designated PM2.5 nonattainment area within the SFNA. The nonattainment boundary for PM2.5 includes all of Sacramento County and portions of Yolo, El Dorado, Solano, and Placer counties.

Given the magnitude of NO_X emissions and the limited geographic scope available for offsets in 2022 through 2027 (Sacramento County), neither Mitigation Measures AQ-1a nor 1b could feasibly reduce NO_X emissions to net zero for the purposes of general conformity.[55] This impact would be adverse. In the event that Alternative 6A is selected as the APA, Reclamation, USFWS, and NMFS would need to demonstrate that conformity is met for NO_X and secondary PM10 formation through a local air quality modeling analysis (i.e., dispersion modeling) or other acceptable methods to ensure project emissions do not cause or contribute to any new violations of the NAAQS or increase the frequency or severity of any existing violations.

Mitigation Measure AQ-1a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-1a under Impact AQ-1 in the discussion of Alternative 1A.

Mitigation Measure AQ-1b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-1b under Impact AQ-1 in the discussion of Alternative 1A.

San Joaquin Valley Air Basin

As shown in Table 22-23, implementation of Alternative 1A (and thus Alternative 6A) would exceed the following SJVAB federal *de minimis* thresholds:

- ROG: 2019–2025
- NO_X: 2019–2026

ROG and NO_X are precursors to ozone and NO_X is a precursor to PM, for which the SJVAB is in nonattainment for the NAAQS. Since project emissions exceed the federal *de minimis* threshold for ROG and NO_X, a general conformity determination must be made to demonstrate that total direct and indirect emissions of ROG and NO_X would conform to the appropriate SJVAB SIP for each year of construction in which the *de minimis* thresholds are exceeded.

NO_X is also a precursor to PM and can contribute to PM formation. As discussed above, the SJVAB is currently designated maintenance for the PM10 NAAQS and nonattainment for the PM2.5 NAAQS. NO_X emissions in excess of 100 tons per year trigger a secondary PM precursor threshold, and could conflict with the applicable PM10 and PM2.5 SIPs. As shown in Table 22-23, NO_X emissions generated by construction activities in the SJVAB would exceed 100 tons per year between 2020 and 2024. NO_X offsets pursued for the purposes of general conformity for those years in which NO_X

[55] The secondary PM precursor thresholds are triggered through the General Conformity Regulation (40 CFR 93.153 (a)(1)). Accordingly, confinement of the geographic scope for available offsets only applies to the General Conformity determination and does not influence mitigation feasibility for Impacts AQ-1 or AQ-28.

emissions exceed 100 tons must occur within the federally designated PM2.5 nonattainment and PM10 maintenance areas of the SJVAB, which are consistent with the larger nonattainment boundary for ozone.

As shown in Appendix 22E, *General Conformity Determination,* Attachment 22E-1, SJVAPCD confirms that sufficient emissions reduction credits would be available to fully offset ROG and NO_X emissions in excess of the federal *de minimis* thresholds zero through implementation of Mitigation Measures AQ-4a and 4b. Mitigation Measures AQ-4a and 4b will ensure the requirements of the mitigation and offset program are implemented and conformity requirements for ROG and NO_X are met, should Alternative 6A be selected as the APA.

Mitigation Measure AQ-4a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4a under Impact AQ-4 in the discussion of Alternative 1A.

Mitigation Measure AQ-4b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4b under Impact AQ-4 in the discussion of Alternative 1A.

San Francisco Bay Area Air Basin

As shown in Table 22-23, implementation of the Alternative 1A (and thus Alternative 6A) would not exceed any of the SFBAAB federal *de minimis* thresholds. Accordingly, a general conformity determination is not required as total direct and indirect emissions would conform to the appropriate SFBAAB SIPs.

***CEQA Conclusion*:** SFNA and SJVAB are classified as nonattainment or maintenance areas with regard to the ozone and PM10 NAAQS, and the impact of increases in criteria pollutant emissions above the air basin *de minimis* thresholds could conflict with or obstruct implementation of the applicable air quality plans. Since construction emissions in the SFNA and SJVAB would exceed the *de minimis* thresholds for ROG, NO_X, and PM10 (SFNA only), this impact would be significant.

Mitigation Measures AQ-4a and AQ-4b would ensure project emissions would not result in an increase in regional ROG or NO_X in the SJVAB. These measures would therefore ensure total direct and indirect ROG and NO_X emissions generated by the project would conform to the appropriate SJVAB SIPs by offsetting the action's emissions in the same or nearby area to net zero. Accordingly, impacts would be less than significant with mitigation in the SJVAB.

Although Mitigation Measures AQ-1a and AQ-1b would reduce NO_X in the SFNA, given the magnitude of NO_X emissions and the limited geographic scope available for offsets (Sacramento County), neither measure could feasibly reduce NO_X emissions to net zero for the purposes of general conformity. This impact would be significant and unavoidable in the SFNA.

Emissions generated within the SFBAAB would not exceed the SFBAAB de minimis thresholds and would therefore conform to the appropriate SFBAAB SIPs. No mitigation is required.

Impact AQ-21: Generation of Cumulative Greenhouse Gas Emissions during Construction of the Proposed Water Conveyance Facility

NEPA Effects: Construction activity required for Alternative 6A was assumed to equal activity required for Alternative 1A (see table 22-21). Emissions generated by Alternative 1A would therefore be representative of emissions generated by Alternative 6A. As shown in Table 22-25, construction of Alternative 6B would generate a total of 2.7 million metric tons of GHG emissions. As discussed in section 22.3.2, *Determination of Effects*, any increase in emissions above net zero associated with construction of the BDCP water conveyance features would be adverse. Accordingly, this effect would be adverse. Mitigation Measure AQ-21, which would develop a GHG Mitigation Program to reduce construction-related GHG emissions to net zero, is available address this effect.

***CEQA Conclusion*:** Construction of Alternative 6A would generate a total of 2.7 million metric tons of GHG emissions. This is equivalent to adding 569,000 typical passenger vehicles to the road during construction (U.S. Environmental Protection Agency 2014e). As discussed in section 22.3.2, *Determination of Effects*, any increase in emissions above net zero associated with construction of the BDCP water conveyance features would be significant. Mitigation Measure AQ-21 would develop a GHG Mitigation Program to reduce construction-related GHG emissions to net zero. Accordingly, this impact would be less-than-significant with implementation of Mitigation Measure AQ-21.

Mitigation Measure AQ-21: Develop and Implement a GHG Mitigation Program to Reduce Construction Related GHG Emissions to Net Zero (0)

Please see Mitigation Measure AQ-21 under Impact AQ-21 in the discussion of Alternative 1A.

Impact AQ-22: Generation of Cumulative Greenhouse Gas Emissions from Operation and Maintenance of the Proposed Water Conveyance Facility and Increased Pumping

NEPA Effects: Operation of Alternative 6A would generate direct and indirect GHG emissions. Sources of direct emissions include heavy-duty equipment, on road crew trucks, and employee vehicle traffic. Indirect emissions would be generated predominantly by electricity consumption required for pumping as well as, maintenance, lighting, and other activities.

Table 22-125 summarizes long-term operational GHG emissions associated with operations, maintenance, and increased SWP pumping. Emissions were quantified for both ELT and LLT conditions, although activities would take place annually until project decommissioning. Emissions include state mandates to reduce GHG emissions (described in Impact AQ-21) are presented (there are no BDCP specific operational environmental commitments). Total CO_2e emissions are compared to both the No Action Alternative (NEPA point of comparison) and Existing Conditions (CEQA baseline). As discussed in Section 22.3.1.2, equipment emissions are assumed to be zero under both the No Action Alternative (NEPA point of comparison) and Existing Conditions (CEQA baseline). The equipment emissions presented in Table 22-125 are therefore representative of project impacts for both the NEPA and CEQA analysis.

Table 22-125. GHG Emissions from Operation, Maintenance, and Increased SWP Pumping, Alternative 6A (metric tons/year)

		Electricity CO_{2e}		Total CO_2e	
Condition	Equipment CO_2e	NEPA Point of Comparison	CEQA Baseline	NEPA Point of Comparison	CEQA Baseline
ELT	555	-	-98,883	-	-98,327
LLT	541	-13,705	-39,971	-13,164	-39,429

Note: The *NEPA point of comparison* compares total CO_2e emissions after implementation of Alternative 6A to the No Action Alternative, whereas the *CEQA baseline* compares total CO_2e emissions to Existing Conditions. Negative values represent a net reduction in GHG emissions.

Table 22-27 (Alterative 1A) is representative of equipment GHG emissions that would be generated in each air district under Alternative 6A. Table 22-27 summarizes equipment CO_2e emissions that would be generated in the BAAQMD, SMAQMD, and SJVAPCD (no operational emissions would be generated in the YSAQMD). The table does not include emissions from SWP pumping as these emissions would be generated by power plants located throughout the state (see discussion preceding this impact analysis). GHG emissions presented in Table 22-27 are therefore provided for information purposes only.

SWP Operational and Maintenance GHG Emissions Analysis

Alternative 6A would not add any[56] additional net electricity demand to operation of the SWP and would in fact result in a net reduction in electricity demand (see Table 22-125). Therefore, there will be no impact on SWP operational emissions.

A small amount of additional GHG emissions from equipment would be emitted as a result of the maintenance of new facilities associated with Alternative 6A (Table 22-125). Emissions from additional maintenance activities would become part of the overall DWR maintenance program for the SWP and would be managed under DWR's CAP.

The CAP sets forth DWR's plan to manage its activities and operations to achieve its GHG emissions reduction goals. The CAP commits DWR to monitoring its emissions each year and evaluating its emissions every five years to determine whether it is on a trajectory to achieve its GHG emissions reduction goals. If it appears that DWR will not meet the GHG emission reduction goals established in the plan, DWR may make adjustments to existing emissions reduction measures, devise new measures to ensure achievement of the goals, or take other action.

Consistent with the analysis contained in the CAP and associated Initial Study and Negative Declaration for the CAP, BDCP Alternative 6A would not adversely affect DWR's ability to achieve the GHG emissions reduction goals set forth in the CAP. Further, Alternative 6A would not conflict with any of DWR's specific action GHG emissions reduction measures and implements all applicable

[56] Estimated net energy demand differs slightly from what is presented in Chapter 21, *Energy*. This is because the above analysis includes energy needed for transmission and distribution of water along the Valley String, which is required to enable a comparison with the assumptions in DWR's CAP.

project level GHG emissions reduction measures as set forth in the CAP. BDCP Alternative 6A is therefore consistent with the analysis performed in the CAP. There would be no adverse effect.

CEQA Conclusion: SWP GHG emissions currently are below 1990 levels and achievement of the goals of the CAP means that total DWR GHG emissions will be reduced to 50% of 1990 levels by 2020 and to 80% of 1990 levels by 2050. The implementation of BDCP Alternative 6A would not affect DWR's established emissions reduction goals or baseline (1990) emissions and therefore would not result in a change in total DWR emissions that would be considered significant. Prior adoption of the CAP by DWR already provides a commitment on the part of DWR to make all necessary modifications to DWR's REPP (as described above) or any other GHG emission reduction measure in the CAP that are necessary to achieve DWR's GHG emissions reduction goals. Therefore no amendment to the approved CAP is necessary to ensure the occurrence of the additional GHG emissions reduction activities needed to account for BDCP-related operational or maintenance emissions. The effect of BDCP Alternative 6A with respect to GHG emissions is less than cumulatively considerable and therefore less than significant. No mitigation is required.

Impact AQ-23: Generation of Cumulative Greenhouse Gas Emissions from Increased CVP Pumping as a Result of Implementation of CM1

NEPA Effects: As previously discussed, DWR's CAP cannot be used to evaluate environmental impacts associated with increased CVP pumping, as emissions associated with CVP are not under DWR's control and are not included in the CAP. Accordingly, GHG emissions resulting from increased CVP energy use are evaluated separately from GHG emissions generated as a result of SWP energy use.

Under Alternative 6A, operation of the CVP yields the generation of clean, GHG emissions-free, hydroelectric energy. This electricity is sold into the California electricity market or directly to energy users. Analysis of the existing and future no action condition indicates that the CVP generates and will continue to generate all of the electricity needed to operate the CVP system and approximately 3,500 GWh of excess hydroelectric energy that would be sold to energy users throughout California.

Implementation of Alternative 6A is neither expected to require additional electricity over the No Action Alternative nor reduce the amount of excess CVP generation available for sale from the CVP to electricity users. The CVP is operated using energy generated at CVP hydroelectric facilities and therefore results in no GHG emissions. Rather, implementation of Alternative 6A would reduce GHG emissions by 24,398 to 31,398 metric tons of CO_2e, relative to the No Action Alternative (depending on whether the RPS is assumed in the emissions calculations). Accordingly, there would be no adverse effect.

CEQA Conclusion: Implementation of Alternative 6A is neither expected to require additional electricity over Existing Conditions nor reduce the amount of excess CVP generation available for sale from the CVP to electricity users. All power supplied to CVP facilities would continue to be supplied by GHG emissions-free hydroelectricity and there would be no increase in GHG emissions over Existing Conditions as a result of CVP operations. The impact would be less than significant and no mitigation is required.

Impact AQ-24: Generation of Regional Criteria Pollutants from Implementation of CM2–CM11

NEPA Effects: Table 22-29 summarizes potential construction and operational emissions that may be generated by implementation of CM2–CM11. See the discussion of Impact AQ-24 under Alternative 1A.

Criteria pollutants from restoration and enhancement actions could exceed applicable general conformity *de minimis* levels and applicable local thresholds. The effect would vary according to the equipment used in construction of a specific conservation measure, the location, the timing of the actions called for in the conservation measure, and the air quality conditions at the time of implementation; these effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. The effect of increases in emissions during implementation of CM2–CM11 in excess of applicable general conformity *de minimis* levels and air district regional thresholds (Table 22-8) could violate air basin SIPs and worsen existing air quality conditions. Mitigation Measure AQ-24 would be available to reduce this effect, but emissions would still be adverse.

***CEQA Conclusion*:** Construction and operational emissions associated with the restoration and enhancement actions would result in a significant impact if the incremental difference, or increase, relative to Existing Conditions exceeds the applicable local air district thresholds shown in Table 22-8; these effects are expected to be further evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measure AQ-24 would be available to reduce this effect, but may not be sufficient to reduce emissions below applicable air quality management district thresholds (see Table 22-8). Consequently, this impact would be significant and unavoidable.

Mitigation Measure AQ-24: Develop an Air Quality Mitigation Plan (AQMP) to Ensure Air District Regulations and Recommended Mitigation are Incorporated into Future Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-24 under Impact AQ-24 in the discussion of Alternative 1A.

Impact AQ-25: Exposure of Sensitive Receptors to Health Hazards from Localized Particulate Matter, Carbon Monoxide, and Diesel Particulate Matter from Implementation of CM2–CM11

NEPA Effects: The potential for Alternative 6A to expose sensitive receptors increased health hazards from localized PM, CO, and DPM would be similar to Alternative 1A. Activities shown in Table 22-29 with the greatest potential to have short or long-term air quality impacts are also anticipated to have the greatest potential to expose receptors to substantial pollutant concentrations. The effect would vary according to the equipment used, the location and timing of the actions called for in the conservation measure, the meteorological and air quality conditions at the time of implementation, and the location of receptors relative to the emission source. Potential health effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions.

The effect of increases in PM, CO, or DPM (cancer and non-cancer-risk) in excess of applicable air district thresholds (Table 22-8) at receptor locations could result in adverse health impacts. Mitigation Measures AQ-24 and AQ-25 would be available to reduce this effect.

***CEQA Conclusion*:** Construction and operational emissions associated with the restoration and enhancement actions under Alternative 6A would result in a significant impact if PM, CO, or DPM (cancer and non-cancer-risk) concentrations at receptor locations exceed the applicable local air district thresholds shown in Table 22-8; these effects are expected to be further evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measures AQ-24 and AQ-25 would ensure localized concentrations at receptor locations would be below applicable air quality management district thresholds (see Table 22-8). Consequently, this impact would be less than significant.

Mitigation Measure AQ-24: Develop an Air Quality Mitigation Plan (AQMP) to Ensure Air District Regulations and Recommended Mitigation are Incorporated into Future Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-24 under Impact AQ-24 in the discussion of Alternative 1A.

Mitigation Measure AQ-25: Prepare a Project-Level Health Risk Assessment to Reduce Potential Health Risks from Exposure to Localized DPM and PM Concentrations

Please see Mitigation Measure AQ-25 under Impact AQ-25 in the discussion of Alternative 1A.

Impact AQ-26: Creation of Potential Odors Affecting a Substantial Number of People from Implementation of CM2–CM11

NEPA Effects: The potential for Alternative 6A to expose sensitive receptors increased odors would be similar to Alternative 1A. Accordingly, construction activities associated with CM2-CM11 are not anticipated to result in nuisance odors. Similarly, while restored land uses associated with the program have the potential to generate odors from natural processes, the emissions would be similar in origin and magnitude to the existing land use types in the restored area (e.g., managed wetlands). Moreover, specific odor effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Accordingly, odor-related effects associated with CM2–CM11 would not be adverse.

***CEQA Conclusion*:** Alternative 6A would not result in the addition of major odor producing facilities. Diesel emissions during construction could generate temporary odors, but these would quickly dissipate and cease once construction is completed. Increases in wetland, tidal, and upland habitats may increase the potential for odors from natural processes. However, the origin and magnitude of odors would be similar to the existing land use types in the restored area (e.g., managed wetlands). Moreover, specific odor impacts would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Accordingly, the impact of exposure of sensitive receptors to potential odors would be less than significant. No mitigation is required.

Impact AQ-27: Generation of Cumulative Greenhouse Gas Emissions from Implementation of CM2–CM11

NEPA Effects: CM2–CM11 implemented under Alternative 6A would result in local GHG emissions from construction equipment and vehicle exhaust, similar to Alternative 1A. Restoration activities with the greatest potential for emissions include those that break ground and require use of earthmoving equipment. The type of restoration action and related construction equipment use are shown in Table 22-29. Implementing CM2–CM11 would also affect long-term sequestration rates through land use changes, such as conversion of agricultural land to wetlands, inundation of peat soils, drainage of peat soils, and removal or planting of carbon-sequestering plants.

Without additional information on site-specific characteristics associated with each of the restoration components, a complete assessment of GHG flux from CM2–CM11 is currently not possible. The effect of carbon sequestration and CH_4 generation would vary by land use type, season, and chemical and biological characteristics; these effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measures AQ-24 and AQ-27 would be available to reduce this effect. However, due to the potential for increases in GHG emissions from construction and land use change, this effect would be adverse.

***CEQA Conclusion*:** The restoration and enhancement actions under Alternative 6A could result in a significant impact if activities are inconsistent with applicable GHG reduction plans, do not contribute to a lower carbon future, or generate excessive emissions, relative to other projects throughout the state. These effects are expected to be further evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measures AQ-24 and AQ-27 would be available to reduce this impact, but may not be sufficient to reduce to a less-than-significant level. Consequently, this impact would be significant and unavoidable.

Mitigation Measure AQ-24: Develop an Air Quality Mitigation Plan (AQMP) to Ensure Air District Regulations and Recommended Mitigation are Incorporated into Future Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-24 under Impact AQ-24 in the discussion of Alternative 1A.

Mitigation Measure AQ-27: Prepare a Land Use Sequestration Analysis to Quantify and Mitigate (as Needed) GHG Flux Associated with Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-27 under Impact AQ-27 in the discussion of Alternative 1A.

22.3.3.12 Alternative 6B—Isolated Conveyance with East Alignment and Intakes 1–5 (15,000 cfs; Operational Scenario D)

A total of five intakes would be constructed under Alternative 6B. For the purposes of this analysis, it was assumed that Intakes 1–5 (on the east bank of the Sacramento River) would be constructed under Alternative 6B. Under this alternative, an intermediate pumping plant would also be constructed, and the conveyance facility would be a canal (Figures 3-4 and 3-14 in Chapter 3, *Description of Alternatives*).

Construction and operation of Alternative 6B would require the use of electricity, which would be supplied by the California electrical grid. Power plants located throughout the state supply the grid with power, which will be distributed to the Study area to meet project demand. Power supplied by statewide power plants will generate criteria pollutants. Because these power plants are located throughout the state, criteria pollutant emissions associated with Alternative 6B electricity demand cannot be ascribed to a specific air basin or air district within the Study area. Criteria pollutant emissions from electricity consumption are therefore provided for informational purposes only and are not included in the impact conclusion.

Construction activity required for Alternative 6B was assumed to equal activity required for Alternative 1B. Construction emissions generated by Alternative 1B would therefore be representative of emissions generated by Alternative 6B. Refer to Table 22-31 for a summary of criteria pollutants during construction (years 2016 through 2029) of Alternative 1B that are applicable to this alternative. Operational emissions would be different from Alternative 1B and are provided in Table 22-126. Negative values represent an emissions benefit, relative to the No Action Alternative or Existing Conditions.

Table 22-126. Criteria Pollutant Emissions from Electricity Consumption: Net Project Operations, Alternative 6B (tons/year) [a,b]

Year	Analysis	ROG	CO	NO_X	PM10	PM2.5[c]	SO_2
ELT	CEQA	-2	-16	-221	-19	-19	-93
LLT	NEPA	-1	-9	-122	-10	-10	-52
LLT	CEQA	-2	-21	-288	-24	-24	-122

NEPA = Compares criteria pollutant emissions after implementation of Alternative 6B to the No Action Alternative.

CEQA = Compares criteria pollutant emissions after implementation of Alternative 6B to Existing Conditions.

[a] Emissions assume implementation of RPS (see Appendix 22A, *Air Quality Analysis Methodology*). Power plants that generate electricity for the proposed project would be subject to local air district permitting requirements, including standards to implement BACT to reduce criteria pollutant emissions.

[b] Because GHG emissions are cumulative (see Section 22.3.2.1) and not evaluated at the local air basin or air district level, they are discussed in Impacts AQ-21 and AQ-22. The GHG analysis for SWP power utilizes actual and forecasted GHG emissions rates for the SWP system, which differs slightly from the above analysis. Statewide grid average emission factors were utilized for the above analysis as criteria pollutant emission factors for SWP were unavailable. Please also note that the above analysis does not account for additional renewable energy that will be procured through modifications to DWR's REPP (see Impact AQ-22). Accordingly, the emissions results presented above represent a conservative assessment of potential criteria pollutant emissions.

[c] Emission factors for PM2.5 are currently unavailable. Consequently, PM2.5 emissions were assumed to equal PM10 emissions. Because PM2.5 represents a fraction of PM10, this approach represents a conservative assessment of PM2.5 emissions from electricity consumption.

Impact AQ-1: Generation of Criteria Pollutants in Excess of the SMAQMD Regional Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: Construction activity required for Alternative 6B was assumed to equal activity required for Alternative 1B. Emissions generated by Alternative 1B would therefore be representative of emissions generated by Alternative 6B. As shown in Table 22-30, emissions would exceed SMAQMD's daily NO_X threshold, even with implementation of environmental commitments. Since NO_X is a precursor to ozone and PM, exceedances of SMAQMD's daily NO_X threshold could impact both regional ozone and PM formation, which could worsen regional air quality and air basin attainment of the NAAQS and CAAQS.

While equipment could operate at any work area identified for this alternative, the highest level of NO_X and fugitive dust emissions in the SMAQMD are expected to occur at those sites where the duration and intensity of construction activities would be greatest. This includes all intake and intake pumping plant sites along the east bank of the Sacramento River. See the discussion of Impact AQ-1 under Alternative 1B.

Environmental commitments will reduce construction-related emissions; however, as shown in Table 22-31, NO_X emissions would still exceed SMAQMD's threshold identified in Table 22-8 and would result in an adverse effect to air quality. Mitigation Measures AQ-1a and AQ-1b would be available to reduce NO_X emissions, and would thus address regional effects related to secondary ozone and PM formation.

***CEQA Conclusion*:** NO_X emissions generated during construction would exceed SMAQMD threshold identified in Table 22-8. Since NO_X is a precursor to ozone and PM, exceedances of SMAQMD's daily NO_X threshold could impact both regional ozone and PM formation. SMAQMD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS or NAAQS. The impact of generating NO_X emissions in excess of local air district thresholds would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. This would be a significant impact. Mitigation Measures AQ-1a and AQ-1b would be available to reduce NO_X emissions to a less-than-significant level by offsetting emissions to quantities below SMAQMD CEQA thresholds (see Table 22-8).

Mitigation Measure AQ-1a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-1a under Impact AQ-1 in the discussion of Alternative 1A.

Mitigation Measure AQ-1b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-1b under Impact AQ-1 in the discussion of Alternative 1A.

Impact AQ-2: Generation of Criteria Pollutants in Excess of the YSAQMD Regional Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: Construction activity required for Alternative 6B within the YSAQMD was assumed to equal activity required for Alternative 1B. Emissions generated by Alternative 1B would therefore be representative of emissions generated by Alternative 6B. As shown in Table 22-31, emissions would exceed YSAQMD's NO_X and PM10 thresholds, even with implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*).

Since NO_X is a precursor to ozone and PM, exceedances of SMAQMD's daily NO_X threshold could impact both regional ozone and PM formation, which could worsen regional air quality and air basin attainment of the NAAQS and CAAQS. Similarly, exceedances of YSAQMD's PM10 threshold could impede attainment of the NAAQS and CAAQS for PM10. All emissions generated within YSAQMD are a result of haul truck movement for equipment and material delivery.

Environmental commitments outlined in Appendix 3B, *Environmental Commitments,* will reduce construction-related emissions; however, as shown in Table 22-31, NO_X and PM10 emissions would still exceed the applicable YSAQMD thresholds identified in Table 22-8 and result in an adverse regional effect to air quality. Mitigation Measures AQ-1a and AQ-1b are available to reduce NO_X and

PM10 emissions, and would thus address regional effects related to secondary ozone and PM formation.

***CEQA Conclusion*:** Emissions of NO_X and PM10 generated during construction would exceed YSAQMD's regional thresholds identified in Table 22-8. Since NO_X is a precursor to ozone and NO_X is a precursor to PM, exceedances of YSAQMD's NO_X threshold could impact both regional ozone and PM formation, which could worsen regional air quality and air basin attainment of the NAAQS and CAAQS. Similarly, exceedances of YSAQMD's PM10 threshold could impede attainment of the NAAQS and CAAQS for PM10. YSAQMD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS or NAAQS. The impact of generating NO_X and PM10 in excess of local air district regional thresholds would therefore violate applicable air quality standards in the study area and could contribute to or worsen an existing air quality conditions. This would be a significant impact. Mitigation Measures AQ-1a and AQ-1b would be available to reduce NO_X and PM10 emissions to a less-than-significant level by offsetting emissions to quantities below YSAQMD CEQA thresholds (see Table 22-8).

Mitigation Measure AQ-1a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-1a under Impact AQ-1 in the discussion of Alternative 1A.

Mitigation Measure AQ-1b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-1b under Impact AQ-1 in the discussion of Alternative 1A.

Impact AQ-3: Generation of Criteria Pollutants in Excess of the BAAQMD Regional Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: Construction activity required for Alternative 6B was assumed to equal activity required for Alternative 1B. Emissions generated by Alternative 1B would therefore be representative of emissions generated by Alternative 6B. As shown in Table 22-30, emissions would exceed BAAQMD's daily ROG and NO_X thresholds, even after implementation of environmental commitments. All other pollutants would be below air district thresholds and therefore would not result in an adverse air quality effect.

Since ROG and NO_X are precursors to ozone and NO_X is a precursor to PM, exceedances of BAAQMD's ROG and NO_X thresholds could impact both regional ozone and PM formation, which could worsen regional air quality and air basin attainment of the NAAQS and CAAQS.

While equipment could operate at any work area identified for this alternative, the highest level of ROG and NO_X emissions in the BAAQMD is expected to occur at those sites where the duration and intensity of construction activities would be greatest, including the site of the Byron Tract Forebay adjacent to and south of Clifton Court Forebay. See the discussion of Impact AQ-3 under Alternative 1B.

Environmental commitments outlined in Appendix 3B, *Environmental Commitments,* will reduce construction-related emissions; however, as shown in Table 22-31, ROG and NO_X emissions would still exceed the applicable air district thresholds identified in Table 22-8 and would result in a regional adverse effect to air quality. Mitigation Measures AQ-3a and AQ-3b would be available to address this effect.

***CEQA Conclusion*:** Emissions of ROG and NO_X precursors generated during construction would exceed BAAQMD thresholds identified in Table 22-8. Since ROG and NO_X are precursors to ozone and NO_X is a precursor to PM, exceedances of BAAQMD's ROG and NO_X thresholds could impact both regional ozone and PM formation. BAAQMD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS or NAAQS. The impact of generating ROG and NO_X emissions in excess of BAAQMD's thresholds would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. This would be a significant impact. Mitigation Measures AQ-3a and AQ-3b would be available to reduce ROG and NO_X emissions to a less-than-significant level.

Mitigation Measure AQ-3a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within BAAQMD/SFBAAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable BAAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-3a under Impact AQ-3 in the discussion of Alternative 1A.

Mitigation Measure AQ-3b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the BAAQMD/SFBAAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable BAAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-3b under Impact AQ-3 in the discussion of Alternative 1A.

Impact AQ-4: Generation of Criteria Pollutants in Excess of the SJVAPCD Regional Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: Construction activity required for Alternative 6B was assumed to equal activity required for Alternative 1B. Emissions generated by Alternative 1B would therefore be representative of emissions generated by Alternative 6B. As shown in Table 22-30, emissions would exceed SJVAPCD's regional thresholds for ROG, NO_X, PM10, and PM2.5, even with implementation of environmental commitments. All other pollutants would be below air district thresholds and therefore would not result in an adverse air quality effect.

Since ROG and NO_X are precursors to ozone and NO_X is a precursor to PM, exceedances of SJVAPCD's ROG and NO_X thresholds could impact both regional ozone and PM formation, which could worsen regional air quality and air basin attainment of the NAAQS and CAAQS. Similarly, exceedances of SJVAPCD's PM10 and PM2.5 thresholds could impede attainment of the NAAQS and CAAQS for PM.

While equipment could operate at any work area identified for this alternative, the highest level of ROG, NO_X, PM10, and PM2.5 emissions in the SJVAPCD are expected to occur at those sites where the duration and intensity of construction activities would be greatest. This includes all temporary and permanent utility sites, as well as all construction sites along the east conveyance alignment. PM10 and PM2.5 emissions are expected to be greatest within the immediate vicinity of the concrete batching plants. For a map of the proposed east alignment, see Mapbook Figure M3-2.

Environmental commitments outlined in Appendix 3B, *Environmental Commitments,* will reduce construction-related emissions; however, as shown in Table 22-30, ROG, NO_X, PM10, and PM2.5 emissions would still exceed the applicable air district thresholds identified in Table 22-8. Mitigation Measures AQ-4a and AQ-4b are available to reduce ROG, NO_X, PM10, and PM2.5 emissions, and would thus address regional effects related to secondary ozone and PM formation.

***CEQA Conclusion*:** Emissions of ROG, NO_X, PM10, and PM2.5 generated during construction would exceed SJVAPCD's annual significance threshold identified in Table 22-8. Since ROG and NO_X are precursors to ozone and NO_X is a precursor to PM, exceedances of SJVAPCD's ROG and NO_X thresholds could impact both regional ozone and PM formation, which could worsen regional air quality and air basin attainment of the NAAQS and CAAQS. Similarly, exceedances of SJVAPCD's PM10 and PM2.5 thresholds could impede attainment of the NAAQS and CAAQS for PM. SJVAPCD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS or NAAQS. The impact of generating ROG, NO_X, PM10, and PM2.5 emissions in excess of local air district thresholds would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. This would be a significant impact. Mitigation Measures AQ-4a and AQ-4b would be available to reduce emissions to a less-than-significant level.

Mitigation Measure AQ-4a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4a under Impact AQ-4 in the discussion of Alternative 1A.

Mitigation Measure AQ-4b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4b under Impact AQ-4 in the discussion of Alternative 1A.

Impact AQ-5: Generation of Criteria Pollutants in Excess of the SMAQMD Regional Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance activities in SMAQMD required for Alternative 6B were assumed to equal activities required for Alternative 1B. Emissions generated by Alternative 1B would therefore be representative of emissions generated by Alternative 6B. As shown in Table 22-32, emissions would not exceed SMAQMD's regional thresholds of significance and there would be no adverse effect. See the discussion of Impact AQ-5 under Alternative 1B.

***CEQA Conclusion*:** Emissions generated during operation and maintenance activities would not exceed SMAQMD regional thresholds for criteria pollutants. SMAQMD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS or NAAQS. The impact of generating emissions in excess of local air district would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Because project operations would not exceed SMAQMD regional thresholds, the impact would be less than significant. No mitigation is required.

Impact AQ-6: Generation of Criteria Pollutants in Excess of the YSAQMD Regional Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Alternative 6B would not involve the construction of any permanent features in the YSAQMD that would require routine operations and maintenance. No operational emissions would be generated in the YSAQMD. Consequently, operation of Alternative 6B would neither exceed the YSAQMD thresholds of significance nor result in an adverse effect on air quality.

***CEQA Conclusion*:** No operational or maintenance emissions generated by the alternative would occur in YSAQMD and, therefore, YSAQMD's regional thresholds would not be exceeded (see Table 22-8). This impact would be less than significant. No mitigation is required.

Impact AQ-7: Generation of Criteria Pollutants in Excess of the BAAQMD Regional Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance activities in BAAQMD required for Alternative 6B were assumed to equal activities required for Alternative 1B. Emissions generated by Alternative 1B would therefore be representative of emissions generated by Alternative 6B. As shown in Table 22-32, emissions would not exceed BAAQMD's regional thresholds of significance and there would be no adverse effect. See the discussion of Impact AQ-7 under Alternative 1B.

***CEQA Conclusion*:** Emissions generated during operation and maintenance activities would not exceed BAAQMD regional thresholds for criteria pollutants. BAAQMD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS or NAAQS. The impact of generating emissions in excess of local air district thresholds would violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Because project operations would not exceed BAAQMD regional thresholds, the impact would be less than significant. No mitigation is required.

Impact AQ-8: Generation of Criteria Pollutants in Excess of the SJVAPCD Regional Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance activities in SJVAPCD required for Alternative 6B were assumed to equal activities required for Alternative 1B. Emissions generated by Alternative 1B would therefore be representative of emissions generated by Alternative 6B. As shown in Table 22-32, emissions would not exceed SJVAPCD's regional thresholds of significance and there would be no adverse effect. See the discussion of Impact AQ-8 under Alternative 1B.

***CEQA Conclusion*:** Emissions generated during operation and maintenance activities would not exceed SJVAPCD's regional thresholds of significance. SJVAPCD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS or NAAQS. The impact of generating emissions in excess of local air district thresholds would violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Because project operations would not exceed SJVAPCD regional thresholds, the impact would be less than significant. No mitigation is required.

Impact AQ-9: Exposure of Sensitive Receptors to Health Hazards from Localized Particulate Matter in Excess of SMAQMD's Health-Based Concentration Thresholds

NEPA Effects: Construction activity required for Alternative 6B within the SMAQMD was assumed to equal activity required for Alternative 1B. Emissions and associated health risks from exposure to localized PM under Alternative 1B would therefore be representative of emissions and health risks generated by Alternative 6B.

As shown in Table 22-33, concentrations of annual PM10 and PM2.5 would be below the SMAQMD's significance thresholds. However, concentrations of PM10 would exceed SMAQMD's 24-hour PM10 threshold near intakes and intake work areas, even with implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*). Receptors exposed to PM10 concentrations in excess of SMAQMD's threshold could experience increased risk for adverse human health effects. Mitigation Measure AQ-9 is available to address this effect.

***CEQA Conclusion*:** Respirable particulates pose a human health hazard by bypassing the defenses within the mucous ciliary system and entering deep lung tissue. Construction of Alternative 6B would result in the short-term exposure of receptors to PM10 concentrations that exceed SMAQMD threshold. This would be a significant impact. Mitigation Measure AQ-9 outlines a tiered strategy to reduce PM10 concentrations and public exposure to a less-than-significant level.

Mitigation Measure AQ-9: Implement Measures to Reduce Re-Entrained Road Dust and Receptor Exposure to PM2.5 and PM10

Please see Mitigation Measure AQ-9 under Impact AQ-9 in the discussion of Alternative 1A.

Impact AQ-10: Exposure of Sensitive Receptors to Health Hazards from Localized Particulate Matter in Excess of YSAQMD's Health-Based Concentration Thresholds

NEPA Effects: Construction activity required for Alternative 6B within the YSAQMD was assumed to equal activity required for Alternative 1B. Emissions and associated health risks from exposure to localized PM under Alternative 1B would therefore be representative of emissions and health risks generated by Alternative 6B. As shown previously in Table 22-34, concentrations of particulate matter would not exceed YSAQMD's 24-hour and annual PM10 and PM2.5 thresholds and consequently would not result in an adverse effect to human health.

***CEQA Conclusion*:** Respirable particulates pose a human health hazard by bypassing the defenses within the mucous ciliary system and entering deep lung tissue. Construction of Alternative 6B would result in PM2.5 and PM10 concentrations at receptor locations that are below the significance thresholds established by the YSAQMD. As such, localized particulate matter concentrations at analyzed receptors would not result in significant human health impacts. No mitigation is required.

Impact AQ-11: Exposure of Sensitive Receptors to Health Hazards from Localized Particulate Matter in Excess of BAAQMD's Health-Based Concentration Thresholds

NEPA Effects: Construction activity required for Alternative 6B within the BAAQMD was assumed to equal activity required for Alternative 1B. Emissions and associated health risks from exposure to localized PM under Alternative 1B would therefore be representative of emissions and health risks generated by Alternative 6B. As shown in Table 22-35, concentrations of particulate matter would not exceed BAAQMD's annual PM2.5 threshold and consequently would not result in an adverse effect to human health.

CEQA Conclusion: Respirable particulates pose a human health hazard by bypassing the defenses within the mucous ciliary system and entering deep lung tissue. Construction of Alternative 6B would result in PM2.5 concentrations at receptor locations that are below the significance thresholds established by the BAAQMD. As such, localized particulate matter concentrations at analyzed receptors would not result in significant human health impacts. No mitigation is required.

Impact AQ-12: Exposure of Sensitive Receptors to Health Hazards from Localized Particulate Matter in Excess of SJVAPCD's Health-Based Concentration Thresholds

NEPA Effects: Construction activity required for Alternative 6B within the SJVPACD was assumed to equal activity required for Alternative 1B. Emissions and associated health risks from exposure to localized PM under Alternative 1B would therefore be representative of emissions and health risks generated by Alternative 6B.

As shown in Table 22-36, concentrations of PM10 and PM2.5 would exceed SJVAPCD's 24-hour thresholds, even with implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*). Receptors exposed to PM10 and PM2.5 concentrations in excess of SMAQMD's threshold could experience increased risk for adverse human health effects. Mitigation Measure AQ-9 is available to address this effect.

CEQA Conclusion: Respirable particulates pose a human health hazard by bypassing the defenses within the mucous ciliary system and entering deep lung tissue. Construction of Alternative 6B would result in the short-term exposure of receptors to PM10 and PM2.5 concentrations that exceed SJVAPCD threshold. This would be a significant impact. Mitigation Measure AQ-9 outlines a tiered strategy to reduce PM10 concentrations and public exposure to a less-than-significant level.

Mitigation Measure AQ-9: Implement Measures to Reduce Re-Entrained Road Dust and Receptor Exposure to PM2.5 and PM10

Please see Mitigation Measure AQ-9 under Impact AQ-9 in the discussion of Alternative 1A.

Impact AQ-13: Exposure of Sensitive Receptors to Health Hazards from Localized Carbon Monoxide

NEPA Effects: Construction activity required for Alternative 6B would be equal to activity required for Alternative 1B. Accordingly, the potential for Alternative 6B to result in CO hot-spots during construction would be the same as Alternative 1B. Given that construction activities typically do not result in CO hot-spots, onsite concentrations must comply with OSHA standards, and CO levels dissipate as a function of distance, equipment-generated CO emissions (see Table 22-31) are not anticipated to result in adverse health hazards to sensitive receptors. Refer to Impact AQ-13 under Alternative 1B.

Traffic associated with construction may contribute to increase roadway congestion, which could lead to conditions conducive to CO hot-spot formation. As shown in Table 19-17, the highest peak hour traffic volumes under BPBGPP—11,968 vehicles per hour—would occur on westbound Interstate 80 between Suisun Valley Road and State Route 12. This is about half of the congested traffic volume modeled by BAAQMD (24,000 vehicles per hour) that would be needed to contribute to a localized CO hot-spot, and less than half of the traffic volume modeled by SMAQMD (31,600 vehicles per hour). Accordingly, construction traffic is not anticipated to result in adverse health hazards to sensitive receptors.

***CEQA Conclusion*:** Continuous engine exhaust may elevate localized CO concentrations. Receptors exposed to these CO "hot-spots" may have a greater likelihood of developing adverse health effects. Construction sites are less likely to result in localized CO hot-spots due to the nature of construction activities (Sacramento Metropolitan Air Quality Management District 2014), which normally utilize diesel-powered equipment for intermittent or short durations. Moreover, construction sites must comply with the OSHA CO exposure standards for onsite workers. Accordingly, given that construction activities typically do not result in CO hot-spots, onsite concentrations must comply with OSHA standards, and CO levels dissipate as a function of distance, equipment-generated CO emissions are not anticipated to result in significant health hazards to sensitive receptors. Similarly, peak-hour construction traffic on local roadways would not exceed BAAQMD's or SMAQMD's conservative screening criteria for the formation potential CO hot-spots. This impact would be less than significant. No mitigation is required.

Impact AQ-14: Exposure of Sensitive Receptors to Health Hazards from Diesel Particulate Matter in Excess of SMAQMD's Chronic Non-Cancer and Cancer Risk Thresholds

NEPA Effects: Construction activity required for Alternative 6B within the SMAQMD was assumed to equal activity required for Alternative 1B. Emissions and resulting health risk generated by Alternative 1B would therefore be representative of emissions and health risk generated by Alternative 6B. As shown in Table 22-37, Alternative 1B would not exceed the SMAQMD's chronic non-cancer or cancer thresholds and, thus, would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to DPM emissions and their health hazards during construction would not be adverse.

***CEQA Conclusion*:** DPM generated during construction poses inhalation-related chronic non-cancer hazard and cancer risk if adjacent receptors are exposed to significant concentrations for prolonged durations. The DPM generated during Alternative 6B construction would not exceed the SMAQMD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this impact for DPM emissions would be less than significant. No mitigation is required.

Impact AQ-15: Exposure of Sensitive Receptors to Health Hazards from Diesel Particulate Matter in Excess of YSAQMD's Chronic Non-Cancer and Cancer Risk Thresholds

NEPA Effects: Construction activity required for Alternative 6B within the YSAQMD was assumed to equal activity required for Alternative 1B. Emissions and associated health risks from localized exposure to DPM under Alternative 1B would therefore be representative of emissions and health risks generated by Alternative 6B. As shown in Table 22-38, Alternative 1B would not exceed the YSAQMD's chronic non-cancer or cancer thresholds and, thus, would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to DPM emissions and their health hazards during construction would not be adverse.

***CEQA Conclusion*:** DPM generated during construction poses inhalation-related chronic non-cancer hazard and cancer risk if adjacent receptors are exposed to significant concentrations for prolonged durations. The DPM generated during Alternative 6B construction would not exceed the YSAQMD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this impact for DPM emissions would be less than significant. No mitigation is required.

Impact AQ-16: Exposure of Sensitive Receptors to Health Hazards from Diesel Particulate Matter in Excess of BAAQMD's Chronic Non-Cancer and Cancer Risk Thresholds

NEPA Effects: Construction activity required for Alternative 6B was assumed to equal activity required for Alternative 1B. Emissions and associated health risks from exposure to localized DPM under Alternative 1B would therefore be representative of emissions and health risks generated by Alternative 6B. As shown in Table 22-39, Alternative 1B would not exceed the BAAQMD's chronic non-cancer or cancer thresholds and, thus, would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to DPM emissions and their health hazards during construction would not be adverse.

***CEQA Conclusion*:** DPM generated during construction poses inhalation-related chronic non-cancer hazard and cancer risk if adjacent receptors are exposed to significant concentrations for prolonged durations. The health hazards resulting from DPM generated by Alternative 6B would not exceed the BAAQMD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this impact for DPM health hazards would be less than significant. No mitigation is required.

Impact AQ-17: Exposure of Sensitive Receptors to Health Hazards in Excess of SJVAPCD's Health-Risk Assessment Thresholds

NEPA Effects: Construction activity required for Alternative 6B was assumed to equal activity required for Alternative 2B. Emissions and associated health risks from exposure to localized DPM under Alternative 1B would therefore be representative of emissions and health risks generated by Alternative 6B. As shown in Table 22-40, chronic risk under Alternative 1B would be below the SJVAPCD's significance thresholds. However, cancer risk would exceed SJVAPCD's cancer risk significance threshold, even with implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*). Therefore, this alternative's effect of exposure of sensitive receptors to DPM-related health hazards during construction would be adverse.

Mitigation Measure AQ-16 would be available to reduce exposure to substantial cancer risk by relocating affected receptors. Although Mitigation Measure AQ-16 would reduce the severity of this effect, the BDCP proponents are not solely responsible for implementation of the measure. If a landowner chooses not to accept DWR's offer of relocation assistance, an adverse effect in the form excess cancer risk above air district thresholds would occur. Therefore, this effect would be adverse. If, however, all landowners accept DWR's offer of relocation assistance, effects would not be adverse.

***CEQA Conclusion*:** DPM generated during construction poses inhalation-related chronic non-cancer hazard and cancer risk if adjacent receptors are exposed to significant concentrations for prolonged durations. The DPM generated during Alternative 6B construction would not exceed the SJVAPCD's chronic non-cancer hazard threshold; however, it would exceed the SJVAPCD's cancer thresholds. Therefore, this impact would be significant.

Mitigation Measure AQ-16 would be available to reduce exposure to substantial cancer risk by relocating affected receptors. Although Mitigation Measure AQ-16 would reduce the severity of this effect, the BDCP proponents are not solely responsible for implementation of the measure. If a landowner chooses not to accept DWR's offer of relocation assistance, a significant impact in the form excess cancer risk above air district thresholds would occur. Therefore, this effect would be significant and unavoidable. If, however, all landowners accept DWR's offer of relocation assistance, the impact would be less than significant.

Mitigation Measure AQ-16: Relocate Sensitive Receptors to Avoid Excess Cancer Risk

Please see Mitigation Measure AQ-16 under Impact AQ-16 in the discussion of Alternative 1A.

Impact AQ-18: Exposure of Sensitive Receptors to *Coccidioides immitis* (Valley Fever)

NEPA Effects: As discussed under Alternative 1A, earthmoving activities during construction could release *C. immitis* spores if filaments are present and other soil chemistry and climatic conditions are conducive to spore development. Receptors adjacent to the construction area may therefore be exposed to increase risk of inhaling *C. immitis* spores and subsequent development of Valley Fever. Dust-control measures are the primary defense against infection (United States Geological Survey 2000). Implementation of advanced air-district recommended fugitive dust controls outlined in Appendix 3B, *Environmental Commitments*, would avoid dusty conditions and reduce the risk of contracting Valley Fever through routine watering and other controls. Therefore, this alternative's effect of exposure of sensitive receptors to increased Valley Fever risk during construction would not be adverse.

CEQA Conclusion: Construction of the water conveyance facility would involve earthmoving activities that could release *C. immitis* spores if filaments are present and other soil chemistry and climatic conditions are conducive to spore development. Receptors adjacent to the construction area may therefore be exposed to increase risk of inhaling *C. immitis* spores and subsequent development of Valley Fever. Implementation of air-district recommended fugitive dust controls outlined in Appendix 3B, *Environmental Commitments*, would avoid dusty conditions and reduce the risk of contracting Valley Fever through routine watering and other controls. Therefore, this impact would be less than significant. No mitigation is required.

Impact AQ-19: Creation of Potential Odors Affecting a Substantial Number of People during Construction or Operation of the Proposed Water Conveyance Facility

NEPA Effects: As discussed under Alternative 1A, odors from construction activities would be localized and generally confined to the immediate area surrounding the construction site. Moreover, odors would be temporary and localized, and they would cease once construction activities have been completed. Thus, it is not anticipated that construction of CM1 would create objectionable odors from construction equipment or asphalt paving.

Construction of the water conveyance facility would require removal of subsurface material during tunnel excavation and sediment removal. As discussed under Alternative 1A, geotechnical tests indicate that VOC levels in Plan Area soils are below the method detection limits, indicating that organic decay of exposed RTM and sediment will be relatively low (URS 2014). Moreover, drying and stockpiling of the removed RTM and sediment will occur under aerobic conditions, which will further limit any potential decomposition and associated malodorous products. Accordingly, it is not anticipated that tunnel and sediment excavation would create objectionable odors.

Typical facilities known to produce odors include landfills, wastewater treatment plants, food processing facilities, and certain agricultural activities. Alternative 6B would not result in the addition of facilities associated with odors, and as such, long-term operation of the water conveyance facility would not result in objectionable odors.

***CEQA Conclusion*:** Alternative 6B would not result in the addition of major odor producing facilities. Diesel emissions during construction could generate temporary odors, but these would quickly dissipate and cease once construction is completed. Likewise, potential odors generated during asphalt paving would be addressed through mandatory compliance with air district rules and regulations. While tunnel excavation would unearth substantial quantities of RTM, geotechnical tests indicate that soils in the Plan Area have relatively low organic constituents. Moreover, drying and stockpiling of the removed RTM will occur under aerobic conditions, which will further limit any potential decomposition and associated malodorous products. Accordingly, the impact of exposure of sensitive receptors to potential odors during construction would be less than significant. No mitigation is required.

Impact AQ-20: Generation of Criteria Pollutants in the Excess of Federal *De Minimis* Thresholds from Construction and Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: As discussed above, emissions generated by Alternative 1B within the SFNA, SJVAB, and SFBAAB would be representative of emissions generated by Alternative 6B (refer to Table 22-41).

Sacramento Federal Nonattainment Area

As shown in Table 22-41, implementation of Alternative 1B (and thus Alternative 6B) would exceed the following SFNA federal *de minimis* thresholds:

- ROG: 2023–2024
- NO_X: 2018–2028
- PM10: 2024

ROG and NO_X are precursors to ozone and NO_X is a precursor to PM, for which the SFNA is in nonattainment for the NAAQS. Sacramento County is also a maintenance area for the PM10 NAAQS. Since project emissions exceed the federal *de minimis* thresholds for ROG, NO_X, and PM10, a general conformity determination must be made to demonstrate that total direct and indirect emissions of ROG, NO_X, and PM10would conform to the appropriate SFNA SIP for each year of construction in which the *de minimis* thresholds are exceeded.

NO_X is also a precursor to PM and can contribute to PM formation. As discussed above, Sacramento County is currently designated maintenance for the PM10 NAAQS and portions of the SVAB are designated nonattainment for the PM2.5 NAAQS. NO_X emissions in excess of 100 tons per year in Sacramento County trigger a secondary PM10 precursor threshold, whereas NO_X emissions in excess of 100 tons per year in the SVAB trigger a secondary PM2.5 precursor threshold. Since NO_X emissions can contribute to PM formation, NO_X emissions in excess of these secondary precursor thresholds could conflict with the applicable PM10 and PM2.5 SIPs. Accordingly, NO_X offsets pursued for the purposes of general conformity for those years in which NO_X emissions exceed 100 tons must occur within the federally designated PM2.5 nonattainment and PM10 maintenance areas of the SVAB.

As shown in Table 22-31, NO_X emissions generated by construction activities in SMAQMD (Sacramento County) would exceed 100 tons per year between 2019 and 2027. The project therefore triggers the secondary PM10 precursor threshold, requiring all NO_X offsets for 2019 through 2027 to occur within Sacramento County.

Given the magnitude of NO_X emissions and the limited geographic scope available for offsets in 2019 through 2027 (Sacramento County), neither Mitigation Measures AQ-1a nor 1b could feasibly reduce NO_X emissions to net zero for the purposes of general conformity.[57] This impact would be adverse. In the event that Alternative 6B is selected as the APA, Reclamation, USFWS, and NMFS would need to demonstrate that conformity is met for NO_X and secondary PM10 formation through a local air quality modeling analysis (i.e., dispersion modeling) or other acceptable methods to ensure project emissions do not cause or contribute to any new violations of the NAAQS or increase the frequency or severity of any existing violations.

Mitigation Measure AQ-1a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-1a under Impact AQ-1 in the discussion of Alternative 1A.

Mitigation Measure AQ-1b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-1b under Impact AQ-1 in the discussion of Alternative 1A.

San Joaquin Valley Air Basin

As shown in Table 22-41, implementation of Alternative 1B (and thus Alternative 6B) would exceed SJVAB federal *de minimis* thresholds for the following pollutants and years.

- ROG: 2018–2024
- NO_X: 2018–2024
- PM10: 2019

ROG and NO_X are precursors to ozone and NO_X is a precursor to PM, for which the SJVAB is in nonattainment for the NAAQS. Likewise, the SJVAB is current classified as a maintenance area for PM10. Since project emissions exceed the federal *de minimis* threshold for ROG, NO_X, and PM10, a general conformity determination must be made to demonstrate that total direct and indirect emissions would conform to the appropriate SJVAB SIPs for each year of construction for which the *de minimis* thresholds are exceed.

NO_X is also a precursor to PM and can contribute to PM formation. As discussed above, the SJVAB is currently designated maintenance for the PM10 NAAQS and nonattainment for the PM2.5 NAAQS. NO_X emissions in excess of 100 tons per year trigger a secondary PM precursor threshold, and could conflict with the applicable PM10 and PM2.5 SIPs. As shown in Table 22-41, NO_X emissions

[57] The secondary PM precursor thresholds are triggered through the General Conformity Regulation (40 CFR 93.153 (a)(1)). Accordingly, confinement of the geographic scope for available offsets only applies to the General Conformity determination and does not influence mitigation feasibility for Impacts AQ-1 or AQ-28.

generated by construction activities in the SJVAB would exceed 100 tons per year between 2019 and 2022. NO_X offsets pursued for the purposes of general conformity for those years in which NO_X emissions exceed 100 tons must occur within the federally designated PM2.5 nonattainment and PM10 maintenance areas of the SJVAB, which are consistent with the larger nonattainment boundary for ozone.

As shown in Appendix 22E, *General Conformity Determination,* Attachment 22E-1, SJVAPCD confirms that sufficient emissions reduction credits would be available to fully offset ROG, NO_X, and PM10 emissions in excess of the federal *de minimis* thresholds zero through implementation of Mitigation Measures AQ-4a and 4b. Mitigation Measures AQ-4a and 4b will ensure the requirements of the mitigation and offset program are implemented and conformity requirements for ROG, NO_X, and PM10 are met, should Alternative 6B be selected as the APA.

Mitigation Measure AQ-4a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4a under Impact AQ-4 in the discussion of Alternative 1A.

Mitigation Measure AQ-4b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4b under Impact AQ-4 in the discussion of Alternative 1A.

San Francisco Bay Area Air Basin

As shown in Table 22-41, implementation of the Alternative 1B (and thus Alternative 6B) would not exceed any of the SFBAAB federal *de minimis* thresholds. Accordingly, a general conformity determination is not required as total direct and indirect emissions of NO_X would conform to the appropriate SFBAAB SIPs.

***CEQA Conclusion*:** SFNA and SJVAB are classified as nonattainment or maintenance areas with regard to the ozone and PM10 NAAQS, and the impact of increases in criteria pollutant emissions above the air basin *de minimis* thresholds could conflict with or obstruct implementation of the applicable air quality plans. Since construction emissions in the SFNA and SJVAB would exceed the *de minimis* thresholds for ROG, NO_X, and PM10, this impact would be significant.

Mitigation Measures AQ-4a and AQ-4b would ensure project emissions would not result in an increase in regional ROG, NO_X, or PM10 in the SJVAB. These measures would therefore ensure total direct and indirect ROG, NO_X, and PM10 emissions generated by the project would conform to the appropriate SJVAB SIPs by offsetting the action's emissions in the same or nearby area to net zero. Accordingly, impacts would be less than significant with mitigation in the SJVAB.

Although Mitigation Measures AQ-1a and AQ-1b would reduce NO_X in the SFNA, given the magnitude of NO_X emissions and the limited geographic scope available for offsets (Sacramento County), neither measure could feasibly reduce NO_X emissions to net zero for the purposes of general conformity. This impact would be significant and unavoidable in the SFNA.

Emissions generated within the SFBAAB would not exceed the SFBAAB de minimis thresholds and would therefore conform to the appropriate SFBAAB SIPs. No mitigation is required.

Impact AQ-21: Generation of Cumulative Greenhouse Gas Emissions during Construction of the Proposed Water Conveyance Facility

NEPA Effects: Construction activity required for Alternative 6B was assumed to equal activity required for Alternative 1B. Emissions generated by Alternative 1B would therefore be representative of emissions generated by Alternative 6B. As shown in Table 22-42, construction of Alternative 6B would generate a total of 2.0 million metric tons of GHG emissions. As discussed in section 22.3.2, *Determination of Effects*, any increase in emissions above net zero associated with construction of the BDCP water conveyance features would be adverse. Accordingly, this effect would be adverse. Mitigation Measure AQ-21, which would develop a GHG Mitigation Program to reduce construction-related GHG emissions to net zero, is available address this effect.

***CEQA Conclusion*:** Construction of Alternative 6B would generate a total of 2.0 million metric tons of GHG emissions. This is equivalent to adding 427,000 typical passenger vehicles to the road during construction (U.S. Environmental Protection Agency 2014e). As discussed in section 22.3.2, *Determination of Effects*, any increase in emissions above net zero associated with construction of the BDCP water conveyance features would be significant. Mitigation Measure AQ-21 would develop a GHG Mitigation Program to reduce construction-related GHG emissions to net zero. Accordingly, this impact would be less-than-significant with implementation of Mitigation Measure AQ-21.

Mitigation Measure AQ-21: Develop and Implement a GHG Mitigation Program to Reduce Construction Related GHG Emissions to Net Zero (0)

Please see Mitigation Measure AQ-21 under Impact AQ-21 in the discussion of Alternative 1A.

Impact AQ-22: Generation of Cumulative Greenhouse Gas Emissions from Operation and Maintenance of the Proposed Water Conveyance Facility and Increased Pumping

NEPA Effects: Operation of Alternative 6B would generate direct and indirect GHG emissions. Sources of direct emissions include heavy-duty equipment, on road crew trucks, and employee vehicle traffic. Indirect emissions would be generated predominantly by electricity consumption required for pumping as well as, maintenance, lighting, and other activities.

Table 22-127 summarizes long-term operational GHG emissions associated with operations, maintenance, and increased SWP pumping. Emissions were quantified for both ELT and LLT conditions, although activities would take place annually until project decommissioning. Emissions include state mandates to reduce GHG emissions (described in Impact AQ-21) are presented (there are no BDCP specific operational environmental commitments). Total CO_2e emissions are compared to both the No Action Alternative (NEPA point of comparison) and Existing Conditions (CEQA baseline). As discussed in Section 22.3.1.2, equipment emissions are assumed to be zero under both the No Action Alternative (NEPA point of comparison) and Existing Conditions (CEQA baseline). The equipment emissions presented in Table 22-127 are therefore representative of project impacts for both the NEPA and CEQA analysis.

Table 22-127. GHG Emissions from Operation, Maintenance, and Increased SWP Pumping, Alternative 6B (metric tons/year)

		Electricity CO_{2e}		Total CO_2e	
Condition	Equipment CO_2e	NEPA Point of Comparison	CEQA Baseline	NEPA Point of Comparison	CEQA Baseline
ELT	436	-	-105,213	-	-104,778
LLT	418	-18,661	-44,927	-18,243	-44,508

Note: The *NEPA point of comparison* compares total CO_2e emissions after implementation of Alternative 6B to the No Action Alternative, whereas the *CEQA baseline* compares total CO_2e emissions to Existing Conditions. Negative values represent a net GHG reduction.

Table 22-45 summarizes equipment CO_2e emissions that would be generated in the BAAQMD, SMAQMD, and SJVAPCD (no operational emissions would be generated in the YSAQMD). The table does not include emissions from concrete absorption or SWP pumping as these emissions would be generated by power plants located throughout the state (see discussion preceding this impact analysis). GHG emissions presented in Table 22-45 are therefore provided for information purposes only.

SWP Operational and Maintenance GHG Emissions Analysis

Alternative 6B would not add any additional net electricity demand to operation of the SWP and would in fact result in a net reduction in electricity demand (see Table 22-127). Therefore, there will be no impact on SWP operational emissions.

A small amount of additional GHG emissions from equipment would be emitted as a result of the maintenance of new facilities associated with Alternative 6B (Table 22-127). Emissions from additional maintenance activities would become part of the overall DWR maintenance program for the SWP and would be managed under DWR's CAP.

The CAP sets forth DWR's plan to manage its activities and operations to achieve its GHG emissions reduction goals. The CAP commits DWR to monitoring its emissions each year and evaluating its emissions every five years to determine whether it is on a trajectory to achieve its GHG emissions reduction goals. If it appears that DWR will not meet the GHG emission reduction goals established in the plan, DWR may make adjustments to existing emissions reduction measures, devise new measures to ensure achievement of the goals, or take other action.

Consistent with the analysis contained in the CAP and associated Initial Study and Negative Declaration for the CAP, BDCP Alternative 6B would not adversely affect DWR's ability to achieve the GHG emissions reduction goals set forth in the CAP. Further, Alternative 6B would not conflict with any of DWR's specific action GHG emissions reduction measures and implements all applicable project level GHG emissions reduction measures as set forth in the CAP. BDCP Alternative 6B is therefore consistent with the analysis performed in the CAP. There would be no adverse effect.

***CEQA Conclusion*:** SWP GHG emissions currently are below 1990 levels and achievement of the goals of the CAP means that total DWR GHG emissions will be reduced to 50% of 1990 levels by 2020 and to 80% of 1990 levels by 2050. The implementation of BDCP Alternative 6B would not affect DWR's established emissions reduction goals or baseline (1990) emissions and therefore would not result in a change in total DWR emissions that would be considered significant. Prior adoption of the CAP by DWR already provides a commitment on the part of DWR to make all necessary modifications to DWR's REPP (as described above) or any other GHG emission reduction measure in the CAP that are necessary to achieve DWR's GHG emissions reduction goals. Therefore no amendment to the approved CAP is necessary to ensure the occurrence of the additional GHG emissions reduction activities needed to account for BDCP-related operational or maintenance emissions. The effect of BDCP Alternative 6B with respect to GHG emissions is less than cumulatively considerable and therefore less than significant. No mitigation is required.

Impact AQ-23: Generation of Cumulative Greenhouse Gas Emissions from Increased CVP Pumping as a Result of Implementation of CM1

NEPA Effects: As previously discussed, DWR's CAP cannot be used to evaluate environmental impacts associated with increased CVP pumping, as emissions associated with CVP are not under DWR's control and are not included in the CAP. Accordingly, GHG emissions resulting from increased CVP energy use are evaluated separately from GHG emissions generated as a result of SWP energy use.

Under Alternative 6B, operation of the CVP yields the generation of clean, GHG emissions-free, hydroelectric energy. This electricity is sold into the California electricity market or directly to energy users. Analysis of the existing and future no action condition indicates that the CVP generates and will continue to generate all of the electricity needed to operate the CVP system and approximately 3,500 GWh of excess hydroelectric energy that would be sold to energy users throughout California.

Implementation of Alternative 6B is neither expected to require additional electricity over the No Action Alternative nor reduce the amount of excess CVP generation available for sale from the CVP to electricity users. The CVP is operated using energy generated at CVP hydroelectric facilities and therefore results in no GHG emissions. Rather, implementation of Alternative 6B would reduce GHG emissions by 24,398 to 31,398 metric tons of CO_2e, relative to the No Action Alternative (depending on whether the RPS is assumed in the emissions calculations). Accordingly, there would be no adverse effect.

***CEQA Conclusion*:** Implementation of Alternative 6B is neither expected to require additional electricity over Existing Conditions nor reduce the amount of excess CVP generation available for sale from the CVP to electricity users. All power supplied to CVP facilities would continue to be supplied by GHG emissions-free hydroelectricity and there would be no increase in GHG emissions over Existing Conditions as a result of CVP operations. The impact would be less than significant and no mitigation is required.

Impact AQ-24: Generation of Regional Criteria Pollutants from Implementation of CM2–CM11

NEPA Effects: Table 22-29 summarizes potential construction and operational emissions that may be generated by implementation of CM2–CM11. See the discussion of Impact AQ-24 under Alternative 1A.

Criteria pollutants from restoration and enhancement actions could exceed applicable general conformity *de minimis* levels and applicable local thresholds. The effect would vary according to the equipment used in construction of a specific conservation measure, the location, the timing of the actions called for in the conservation measure, and the air quality conditions at the time of implementation; these effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. The effect of increases in emissions during implementation of CM2–CM11 in excess of applicable general conformity *de minimis* levels and air district regional thresholds (Table 22-8) could violate air basin SIPs and worsen existing air quality conditions. Mitigation Measure AQ-24 would be available to reduce this effect, but emissions would still be adverse.

***CEQA Conclusion*:** Construction and operational emissions associated with the restoration and enhancement actions would result in a significant impact if the incremental difference, or increase, relative to Existing Conditions exceeds the applicable local air district thresholds shown in Table 22-8; these effects are expected to be further evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measure AQ-24 would be available to reduce this effect, but may not be sufficient to reduce emissions below applicable air quality management district thresholds (see Table 22-8). Consequently, this impact would be significant and unavoidable.

Mitigation Measure AQ-24: Develop an Air Quality Mitigation Plan (AQMP) to Ensure Air District Regulations and Recommended Mitigation are Incorporated into Future Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-24 under Impact AQ-24 in the discussion of Alternative 1A.

Impact AQ-25: Exposure of Sensitive Receptors to Health Hazards from Localized Particulate Matter, Carbon Monoxide, and Diesel Particulate Matter from Implementation of CM2–CM11

NEPA Effects: The potential for Alternative 6B to expose sensitive receptors increased health hazards from localized PM, CO, and DPM would be similar to Alternative 1A. Activities shown in Table 22-29 with the greatest potential to have short or long-term air quality impacts are also anticipated to have the greatest potential to expose receptors to substantial pollutant concentrations. The effect would vary according to the equipment used, the location and timing of the actions called for in the conservation measure, the meteorological and air quality conditions at the time of implementation, and the location of receptors relative to the emission source. Potential health effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions.

The effect of increases in PM, CO, or DPM (cancer and non-cancer-risk) in excess of applicable air district thresholds (Table 22-8) at receptor locations could result in adverse health impacts. Mitigation Measures AQ-24 and AQ-25 would be available to reduce this effect.

***CEQA Conclusion*:** Construction and operational emissions associated with the restoration and enhancement actions under Alternative 6B would result in a significant impact if PM, CO, or DPM (cancer and non-cancer-risk) concentrations at receptor locations exceed the applicable local air district thresholds shown in Table 22-8; these effects are expected to be further evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measures AQ-24 and AQ-25 would ensure localized concentrations at receptor locations would be below applicable air quality management district thresholds (see Table 22-8). Consequently, this impact would be less than significant.

Mitigation Measure AQ-24: Develop an Air Quality Mitigation Plan (AQMP) to Ensure Air District Regulations and Recommended Mitigation are Incorporated into Future Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-24 under Impact AQ-24 in the discussion of Alternative 1A.

Mitigation Measure AQ-25: Prepare a Project-Level Health Risk Assessment to Reduce Potential Health Risks from Exposure to Localized DPM and PM Concentrations

Please see Mitigation Measure AQ-25 under Impact AQ-25 in the discussion of Alternative 1A.

Impact AQ-26: Creation of Potential Odors Affecting a Substantial Number of People from Implementation of CM2–CM11

NEPA Effects: The potential for Alternative 6B to expose sensitive receptors increased odors would be similar to Alternative 1A. Accordingly, construction activities associated with CM2-CM11 are not anticipated to result in nuisance odors. Similarly, while restored land uses associated with the program have the potential to generate odors from natural processes, the emissions would be similar in origin and magnitude to the existing land use types in the restored area (e.g., managed wetlands). Moreover, specific odor effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Accordingly, odor-related effects associated with CM2–CM11 would not be adverse.

***CEQA Conclusion*:** Alternative 6B would not result in the addition of major odor producing facilities. Diesel emissions during construction could generate temporary odors, but these would quickly dissipate and cease once construction is completed. Increases in wetland, tidal, and upland habitats may increase the potential for odors from natural processes. However, the origin and magnitude of odors would be similar to the existing land use types in the restored area (e.g., managed wetlands). Moreover, specific odor impacts would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Accordingly, the impact of exposure of sensitive receptors to potential odors would be less than significant. No mitigation is required.

Impact AQ-27: Generation of Cumulative Greenhouse Gas Emissions from Implementation of CM2–CM11

NEPA Effects: CM2–CM11 implemented under Alternative 6B would result in local GHG emissions from construction equipment and vehicle exhaust, similar to Alternative 1A. Restoration activities with the greatest potential for emissions include those that break ground and require use of earthmoving equipment. The type of restoration action and related construction equipment use are shown in Table 22-29. Implementing CM2–CM11 would also affect long-term sequestration rates through land use changes, such as conversion of agricultural land to wetlands, inundation of peat soils, drainage of peat soils, and removal or planting of carbon-sequestering plants.

Without additional information on site-specific characteristics associated with each of the restoration components, a complete assessment of GHG flux from CM2–CM11 is currently not possible. The effect of carbon sequestration and CH_4 generation would vary by land use type, season, and chemical and biological characteristics; these effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measures AQ-24 and AQ-27 would be available to reduce this

effect. However, due to the potential for increases in GHG emissions from construction and land use change, this effect would be adverse.

***CEQA Conclusion*:** The restoration and enhancement actions under Alternative 6B could result in a significant impact if activities are inconsistent with applicable GHG reduction plans, do not contribute to a lower carbon future, or generate excessive emissions, relative to other projects throughout the state. These effects are expected to be further evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measures AQ-24 and AQ-27 would be available to reduce this impact, but may not be sufficient to reduce to a less-than-significant level. Consequently, this impact would be significant and unavoidable.

Mitigation Measure AQ-24: Develop an Air Quality Mitigation Plan (AQMP) to Ensure Air District Regulations and Recommended Mitigation are Incorporated into Future Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-24 under Impact AQ-24 in the discussion of Alternative 1A.

Mitigation Measure AQ-27: Prepare a Land Use Sequestration Analysis to Quantify and Mitigate (as Needed) GHG Flux Associated with Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-27 under Impact AQ-27 in the discussion of Alternative 1A.

22.3.3.13 Alternative 6C—Isolated Conveyance with West Alignment and Intakes W1–W5 (15,000 cfs; Operational Scenario D

A total of five intakes would be constructed under Alternative 6C. They would be sited on the west bank of the Sacramento River, opposite the locations identified for the pipeline/tunnel and east alignments. Under this alternative, water would be carried south in a canal along the western side of the Delta to an intermediate pumping plant and then pumped through a tunnel to a continuing canal to the proposed Byron Tract Forebay immediately northwest of Clifton Court Forebay (Figures 3-6 and 3-15 in Chapter 3, *Description of Alternatives*).

Construction and operation of Alternative 6C would require the use of electricity, which would be supplied by the California electrical grid. Power plants located throughout the state supply the grid with power, which will be distributed to the Study area to meet project demand. Power supplied by statewide power plants will generate criteria pollutants. Because these power plants are located throughout the state, criteria pollutant emissions associated with Alternative 6C electricity demand cannot be ascribed to a specific air basin or air district within the Study area. Criteria pollutant emissions from electricity consumption are therefore provided for informational purposes only and are not included in the impact conclusion.

Construction activity required for Alternative 6C was assumed to equal activity required for Alternative 1C. Construction emissions generated by Alternative 1C would therefore be representative of emissions generated by Alternative 6C. Refer to Table 22-47 for a summary of criteria pollutants during construction (years 2016 through 2029) of Alternative 1C that are applicable to this alternative. Operational emissions would be different from Alternative 1C and are provided in Table 22-128. Negative values represent an emissions benefit, relative to the No Action Alternative or Existing Conditions.

Table 22-128. Criteria Pollutant Emissions from Electricity Consumption: Net Project Operations, Alternative 6C (tons/year) [a,b]

Year	Analysis	ROG	CO	NO_X	PM10	PM2.5[c]	SO_2
ELT	CEQA	-1	-14	-193	-16	-16	-81
LLT	NEPA	-1	-7	-96	-8	-8	-40
LLT	CEQA	-2	-19	-261	-22	-22	-110

NEPA = Compares criteria pollutant emissions after implementation of Alternative 6C to the No Action Alternative.

CEQA = Compares criteria pollutant emissions after implementation of Alternative 6C to Existing Conditions.

[a] Emissions assume implementation of RPS (see Appendix 22A, *Air Quality Analysis Methodology*). Power plants that generate electricity for the proposed project would be subject to local air district permitting requirements, including standards to implement BACT to reduce criteria pollutant emissions.

[b] Because GHG emissions are cumulative (see Section 22.3.2.1) and not evaluated at the local air basin or air district level, they are discussed in Impacts AQ-21 and AQ-22. The GHG analysis for SWP power utilizes actual and forecasted GHG emissions rates for the SWP system, which differs slightly from the above analysis. Statewide grid average emission factors were utilized for the above analysis as criteria pollutant emission factors for SWP were unavailable. Please also note that the above analysis does not account for additional renewable energy that will be procured through modifications to DWR's REPP (see Impact AQ-22). Accordingly, the emissions results presented above represent a conservative assessment of potential criteria pollutant emissions.

[c] Emission factors for PM2.5 are currently unavailable. Consequently, PM2.5 emissions were assumed to equal PM10 emissions. Because PM2.5 represents a fraction of PM10, this approach represents a conservative assessment of PM2.5 emissions from electricity consumption.

Impact AQ-1: Generation of Criteria Pollutants in Excess of the SMAQMD Regional Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: Construction activity required for Alternative 6C was assumed to equal activity required for Alternative 1C. Emissions generated by Alternative 1C would therefore be representative of emissions generated by Alternative 6C. As shown in Table 22-48, emissions would exceed SMAQMD's daily NO_X threshold, even with implementation of environmental commitments.

Since NO_X is a precursor to ozone and PM, exceedances of SMAQMD's daily NO_X threshold could impact both regional ozone and PM formation, which could worsen regional air quality and air basin attainment of the NAAQS and CAAQS.

While equipment could operate at any work area identified for this alternative, the highest level of NO_X emissions in the SMAQMD are expected to occur at those sites where the duration and intensity of construction activities would be greatest. This includes all intake and intake pumping plant sites along the west bank of the Sacramento River, as well as the intermediate pumping plant site. See the discussion of Impact AQ-1 under Alternative 1C.

Environmental commitments will reduce construction-related emissions; however, as shown in Table 22-48, NO_X emissions would still exceed SMAQMD's threshold identified in Table 22-8 and would result in an adverse effect to air quality.

Mitigation Measures AQ-1a and AQ-1b would be available to reduce NO_X emissions, and would thus address regional effects related to secondary ozone and PM formation.

***CEQA Conclusion*:** NO_X emissions and generated during construction would exceed SMAQMD threshold identified in Table 22-8. Since NO_X is a precursor to ozone and PM, exceedances of SMAQMD's daily NO_X threshold could impact both regional ozone and PM formation. SMAQMD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS or NAAQS. The impact of generating NO_X emissions in excess of local air district thresholds would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. This would be a significant impact. Mitigation Measures AQ-1a and AQ-1b would be available to reduce NO_X emissions to a less-than-significant level by offsetting emissions to quantities below SMAQMD CEQA thresholds (see Table 22-8).

Mitigation Measure AQ-1a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-1a under Impact AQ-1 in the discussion of Alternative 1A.

Mitigation Measure AQ-1b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-1b under Impact AQ-1 in the discussion of Alternative 1A.

Impact AQ-2: Generation of Criteria Pollutants in Excess of the YSAQMD Regional Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: Construction activity required for Alternative 6C within the YSAQMD was assumed to equal activity required for Alternative 1C. Emissions generated by Alternative 1C would therefore be representative of emissions generated by Alternative 6C. As shown in Table 22-48, emissions would exceed YSAQMD's ROG, NO_X, and PM10 thresholds, even with implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*).

Since ROG and NO_X are precursors to ozone and PM, exceedances of SMAQMD's daily ROG and NO_X thresholds could impact both regional ozone and PM formation, which could worsen regional air quality and air basin attainment of the NAAQS and CAAQS. Similarly, exceedances of YSAQMD's PM10 threshold could impede attainment of the NAAQS and CAAQS for PM10.

Environmental commitments outlined in Appendix 3B, *Environmental Commitments,* will reduce construction-related emissions; however, as shown in Table 22-48, ROG, NO_X, and PM10 emissions would still exceed the applicable YSAQMD thresholds identified in Table 22-8 and result in an adverse regional effect to air quality. Mitigation Measures AQ-1a and AQ-1b are available to reduce ROG, NO_X, and PM10 emissions, and would thus address regional effects related to secondary ozone and PM formation.

***CEQA Conclusion*:** Emissions of ROG, NO_X, and PM10 generated during construction would exceed YSAQMD's regional thresholds identified in Table 22-8. Since ROG and NO_X are precursors to ozone and PM, exceedances of SMAQMD's daily ROG and NO_X thresholds could impact both regional ozone and PM formation, which could worsen regional air quality and air basin attainment of the NAAQS and CAAQS. Similarly, exceedances of YSAQMD's PM10 threshold could impede attainment of the NAAQS and CAAQS for PM10. YSAQMD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS or NAAQS. The impact of generating ROG, NO_X, and PM10 in excess of local air district regional thresholds would therefore violate applicable air quality standards in the study area and could contribute to or worsen an existing air quality conditions. This would be a significant impact. Mitigation Measures AQ-1a and AQ-1b would be available to reduce ROG, NO_X, and PM10 emissions to a less-than-significant level by offsetting emissions to quantities below YSAQMD CEQA thresholds (see Table 22-8).

Mitigation Measure AQ-1a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-1a under Impact AQ-1 in the discussion of Alternative 1A.

Mitigation Measure AQ-1b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-1b under Impact AQ-1 in the discussion of Alternative 1A.

Impact AQ-3: Generation of Criteria Pollutants in Excess of the BAAQMD Regional Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: Construction activity required for Alternative 6C was assumed to equal activity required for Alternative 1C. Emissions generated by Alternative 1C would therefore be representative of emissions generated by Alternative 6C. As shown in Table 22-48, construction emissions would exceed BAAQMD's daily ROG and NO_X thresholds, even with implementation of environmental commitments. All other pollutants would be below air district thresholds and therefore would not result in an adverse air quality effect.

Since ROG and NO_X are precursors to ozone and NO_X is a precursor to PM, exceedances of BAAQMD's ROG and NO_X thresholds could impact both regional ozone and PM formation, which could worsen regional air quality and air basin attainment of the NAAQS and CAAQS.

While equipment could operate at any work area identified for this alternative, the highest level of ROG and NO_X emissions in the BAAQMD are expected to occur at those sites where the duration and intensity of construction activities would be greatest, including the site of the Byron Tract Forebay adjacent to and northwest of Clifton Court Forebay.

Environmental commitments outlined in Appendix 3B, *Environmental Commitments,* will reduce construction-related emissions; however, as shown in Table 22-48, ROG and NO_X emissions would still exceed BAAQMD's thresholds identified in Table 22-8 and would result in an adverse effect to air quality. Although Mitigation Measures AQ-3a and AQ-3b would reduce ROG and NO_X, given the magnitude of estimated emissions, neither measure would reduce emissions below district thresholds.[58] Accordingly, this effect would be adverse.

***CEQA Conclusion*:** Emissions of ROG and NO_X generated during construction would exceed BAAQMD thresholds identified in Table 22-8. Since ROG and NO_X are precursors to ozone and NO_X is a precursor to PM, exceedances of BAAQMD's ROG and NO_X thresholds could impact both regional ozone and PM formation. BAAQMD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS or NAAQS. The impact of generating emissions in excess of local air district thresholds would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Although Mitigation Measures AQ-3a and AQ-3b would reduce ROG and NO_X, given the magnitude of estimated emissions, neither measure would reduce emissions below district thresholds. Accordingly, this impact would be significant and unavoidable.

Mitigation Measure AQ-3a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within BAAQMD/SFBAAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable BAAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-3a under Impact AQ-3 in the discussion of Alternative 1A.

Mitigation Measure AQ-3b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the BAAQMD/SFBAAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable BAAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-3b under Impact AQ-3 in the discussion of Alternative 1A.

Impact AQ-4: Generation of Criteria Pollutants in Excess of the SJVAPCD Regional Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: Construction of Alternative 6C would occur in the YSAQMD SMAQMD, and BAAQMD. No construction emissions would be generated in the SJVAPCD. Consequently, construction of Alternative 6C would neither exceed the SJVAPCD regional thresholds of significance nor result in an adverse effect to air quality.

***CEQA Conclusion*:** Construction emissions generated by the alternative would not exceed SJVAPCD's regional thresholds of significance. This impact is would be less than significant.

[58] The amount of moneys required to achieve sufficient contracts to reduce project emissions below air district thresholds would require immediate and substantial outreach, staffing, and other resources. There are also a number of hurdles related to accelerating equipment turnover and identifying available projects. While the mitigation measure will reduce project emissions, it is unlikely sufficient resources can be identified to reduce emissions by the amount required to achieve a less-than-significant finding.

Impact AQ-5: Generation of Criteria Pollutants in Excess of the SMAQMD Regional Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance activities in SMAQMD required for Alternative 6C were assumed to equal activities required for Alternative 1C. Emissions generated by Alternative 1C would therefore be representative of emissions generated by Alternative 6C. As shown in Table 22-49, emissions would not exceed SMAQMD's regional thresholds of significance and there would be no adverse effect. See the discussion of Impact AQ-5 under Alternative 1C.

***CEQA Conclusion*:** Emissions generated during operation and maintenance activities would not exceed SMAQMD regional thresholds for criteria pollutants. SMAQMD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS or NAAQS. The impact of generating emissions in excess of local air district would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Because project operations would not exceed SMAQMD regional thresholds, the impact would be less than significant. No mitigation is required.

Impact AQ-6: Generation of Criteria Pollutants in Excess of the YSAQMD Regional Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance activities in YSAQMD required for Alternative 6C were assumed to equal activities required for Alternative 1C. Emissions generated by Alternative 1C would therefore be representative of emissions generated by Alternative 6C. As shown in Table 22-49, emissions would not exceed YSAQMD's regional thresholds of significance and there would be no adverse effect. See the discussion of Impact AQ-6 under Alternative 1C.

***CEQA Conclusion*:** Emissions generated during operation and maintenance activities would not exceed YSAQMD's regional thresholds for criteria pollutants. YSAQMD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS. Projects that do not violate YSAQMD's regional thresholds will therefore not conflict with local, state, and federal efforts to improve regional air quality in the SFNA. The impact would be less than significant.

Impact AQ-7: Generation of Criteria Pollutants in Excess of the BAAQMD Regional Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance activities in BAAQMD required for Alternative 6C were assumed to equal activities required for Alternative 1C. Emissions generated by Alternative 1C would therefore be representative of emissions generated by Alternative 6C. As shown in Table 22-49, emissions would not exceed BAAQMD's regional thresholds of significance and there would be no adverse effect. See the discussion of Impact AQ-7 under Alternative 1C.

***CEQA Conclusion*:** Emissions generated during operation and maintenance activities would not exceed BAAQMD regional thresholds for criteria pollutants. The BAAQMD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS or NAAQS. The impact of generating emissions in excess of local air district thresholds would violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Because project operations would not exceed BAAQMD regional thresholds, the impact would be less than significant. No mitigation is required.

Impact AQ-8: Generation of Criteria Pollutants in Excess of the SJVAPCD Regional Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Alternative 6C would not construct any permanent features in the SJVAPCD that would require routine operations and maintenance. No operational emissions would be generated in the SJVAPCD. Consequently, operation of Alternative 6C would neither exceed the SJVAPCD regional thresholds of significance nor result in an adverse effect to air quality.

***CEQA Conclusion*:** Alternative 6C would not construct any permanent features in the SJVAPCD that would require routine operations and maintenance. No operational emissions would be generated in the SJVAPCD. Consequently, operation of Alternative 6C would not contribute to or worsen existing air quality conditions in the SJVAPCD. This impact would be less than significant. No mitigation is required.

Impact AQ-9: Exposure of Sensitive Receptors to Health Hazards from Localized Particulate Matter in Excess of SMAQMD's Health-Based Concentration Thresholds

NEPA Effects: Construction activity required for Alternative 6C within the SMAQMD was assumed to equal activity required for Alternative 1C. Emissions and associated health risks from exposure to localized PM under Alternative 1C would therefore be representative of emissions and health risks generated by Alternative 6C.

As shown in Table 22-50, concentrations of annual PM10 and PM2.5 would be below the SMAQMD's significance thresholds. However, concentrations of PM10 would exceed SMAQMD's 24-hour PM10 threshold, even with implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*). Receptors exposed to PM10 concentrations in excess of SMAQMD's threshold could experience increased risk for adverse human health effects. Mitigation Measure AQ-9 is available to address this effect.

***CEQA Conclusion*:** Respirable particulates pose a human health hazard by bypassing the defenses within the mucous ciliary system and entering deep lung tissue. Construction of Alternative 6C would result in the short-term exposure of receptors to PM10 concentrations that exceed SMAQMD threshold. This would be a significant impact. Mitigation Measure AQ-9 outlines a tiered strategy to reduce PM10 concentrations and public exposure to a less-than-significant level.

Mitigation Measure AQ-9: Implement Measures to Reduce Re-Entrained Road Dust and Receptor Exposure to PM2.5 and PM10

Please see Mitigation Measure AQ-9 under Impact AQ-9 in the discussion of Alternative 1A.

Impact AQ-10: Exposure of Sensitive Receptors to Health Hazards from Localized Particulate Matter in Excess of YSAQMD's Health-Based Concentration Thresholds

NEPA Effects: Construction activity required for Alternative 6C within the YSAQMD was assumed to equal activity required for Alternative 1C. Emissions and associated health risks from exposure to localized PM under Alternative 1C would therefore be representative of emissions and health risks generated by Alternative 6C. As shown previously in Table 22-51, concentrations of particulate matter would not exceed YSAQMD's 24-hour and annual PM10 and PM2.5 thresholds and consequently would not result in an adverse effect to human health.

CEQA Conclusion**:** Respirable particulates pose a human health hazard by bypassing the defenses within the mucous ciliary system and entering deep lung tissue. Construction of Alternative 6C would result in PM2.5 and PM10 concentrations at receptor locations that are below the significance thresholds established by the YSAQMD. As such, localized particulate matter concentrations at analyzed receptors would not result in significant human health impacts. No mitigation is required.

Impact AQ-11: Exposure of Sensitive Receptors to Health Hazards from Localized Particulate Matter in Excess of BAAQMD's Health-Based Concentration Thresholds

NEPA Effects: Construction activity required for Alternative 6C within the BAAQMD was assumed to equal activity required for Alternative 1C. Emissions and associated health risks from exposure to localized PM under Alternative 1C would therefore be representative of emissions and health risks generated by Alternative 6C. As shown in Table 22-52, concentrations of particulate matter would not exceed BAAQMD's annual PM2.5 threshold and consequently would not result in an adverse effect to human health.

CEQA Conclusion**:** Respirable particulates pose a human health hazard by bypassing the defenses within the mucous ciliary system and entering deep lung tissue. Construction of Alternative 6C would result in PM2.5 concentrations at receptor locations that are below the significance thresholds established by the BAAQMD. As such, localized particulate matter concentrations at analyzed receptors would not result in significant human health impacts. No mitigation is required.

Impact AQ-12: Exposure of Sensitive Receptors to Health Hazards from Localized Particulate Matter in Excess of SJVAPCD's Health-Based Concentration Thresholds

NEPA Effects: Construction of Alternative 6C would occur in the SMAQMD, YSAQMD, and BAAQMD. No construction emissions would be generated in the SJVAPCD. Consequently, Alternative 1C would not expose receptors to increased health risks from localized particulate matter since there would be no emissions. There would be no adverse effect.

CEQA Conclusion**:** Construction of Alternative 6C would occur in the SMAQMD, YSAQMD, and BAAQMD. No construction emissions would be generated in the SJVAPCD. Consequently, Alternative 1C would not expose receptors to increased health risks from localized particulate matter since there would be no emissions. This impact would be less than significant. No mitigation is required.

Impact AQ-13: Exposure of Sensitive Receptors to Health Hazards from Localized Carbon Monoxide

NEPA Effects: Construction activity required for Alternative 6C would be similar to activity required for Alternative 1C. Accordingly, the potential for Alternative 6C to result in CO hot-spots during construction would be the same as Alternative 1C. Given that construction activities typically do not result in CO hot-spots, onsite concentrations must comply with OSHA standards, and CO levels dissipate as a function of distance, equipment-generated CO emissions (see Table 22-48) are not anticipated to result in adverse health hazards to sensitive receptors. Refer to Impact AQ-13 under Alternative 1C.

Traffic associated with construction may contribute to increase roadway congestion, which could lead to conditions conducive to CO hot-spot formation. As shown in Table 19-25, the highest peak hour traffic volumes under BPBGPP—11,863 vehicles per hour—would occur on westbound Interstate 80 between Suisun Valley Road and State Route 12. This is about half of the congested traffic volume modeled by BAAQMD (24,000 vehicles per hour) that would be needed to contribute to a localized CO hot-spot, and less than half of the traffic volume modeled by SMAQMD (31,600 vehicles per hour). Accordingly, construction traffic is not anticipated to result in adverse health hazards to sensitive receptors.

***CEQA Conclusion*:** Continuous engine exhaust may elevate localized CO concentrations. Receptors exposed to these CO "hot-spots" may have a greater likelihood of developing adverse health effects. Construction sites are less likely to result in localized CO hot-spots due to the nature of construction activities (Sacramento Metropolitan Air Quality Management District 2014), which normally utilize diesel-powered equipment for intermittent or short durations. Moreover, construction sites must comply with the OSHA CO exposure standards for onsite workers. Accordingly, given that construction activities typically do not result in CO hot-spots, onsite concentrations must comply with OSHA standards, and CO levels dissipate as a function of distance, equipment-generated CO emissions are not anticipated to result in significant health hazards to sensitive receptors. Similarly, peak-hour construction traffic on local roadways would not exceed BAAQMD's or SMAQMD's conservative screening criteria for the formation potential CO hot-spots. This impact would be less than significant. No mitigation is required.

Impact AQ-14: Exposure of Sensitive Receptors to Health Hazards from Diesel Particulate Matter in Excess of SMAQMD's Chronic Non-Cancer and Cancer Risk Thresholds

NEPA Effects: Construction activity required for Alternative 6C was assumed to equal activity required for Alternative 1C. Therefore, the health hazards generated by Alternative 1C would be representative of emissions generated by 6C. As shown in Table 22-53, Alternative 6C would not exceed the SMAQMD's chronic non-cancer or cancer thresholds and, thus, would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to DPM emissions and their health hazards during construction would not be adverse.

***CEQA Conclusion*:** DPM generated during construction poses inhalation-related chronic non-cancer hazard and cancer risk if adjacent receptors are exposed to significant concentrations for prolonged durations. The health hazards resulting from DPM generated by Alternative 6C would not exceed the SMAQMD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this impact for DPM health hazards would be less than significant. No mitigation is required.

Impact AQ-15: Exposure of Sensitive Receptors to Health Hazards from Diesel Particulate Matter in Excess of YSAQMD's Chronic Non-Cancer and Cancer Risk Thresholds

NEPA Effects: Construction activity required for Alternative 6C within the YSAQMD was assumed to equal activity required for Alternative 1C. Emissions and associated health risks from exposure to localized DPM under Alternative 1C would therefore be representative of emissions and health risks generated by Alternative 6C. As shown in Table 22-54, Alternative 6C would not exceed the YSAQMD's chronic non-cancer or cancer thresholds and, thus, would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to DPM emissions and their health hazards during construction would not be adverse.

***CEQA Conclusion*:** DPM generated during construction poses inhalation-related chronic non-cancer hazard and cancer risk if adjacent receptors are exposed to significant concentrations for prolonged durations. The health hazards resulting from DPM generated by Alternative 6C would not exceed the

YSAQMD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this impact for DPM health hazards would be less than significant. No mitigation is required.

Impact AQ-16: Exposure of Sensitive Receptors to Health Hazards from Diesel Particulate Matter in Excess of BAAQMD's Chronic Non-Cancer and Cancer Risk Thresholds

NEPA Effects: Construction activity required for Alternative 6C within the BAAQMD was assumed to equal activity required for Alternative 1C. Emissions and associated health risks from exposure to localized DPM under Alternative 1C would therefore be representative of emissions and health risks generated by Alternative 6C. As shown in Table 22-55, chronic risk would be below the BAAQMD's significance thresholds. However, cancer risk would exceed BAAQMD's cancer significance threshold, even with implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*). Therefore, this alternative's effect of exposure of sensitive receptors to DPM-related health hazards during construction would be adverse.

Mitigation Measure AQ-16 would be available to reduce exposure to substantial cancer risk by relocating affected receptors. Although Mitigation Measure AQ-16 would reduce the severity of this effect, the BDCP proponents are not solely responsible for implementation of the measure. If a landowner chooses not to accept DWR's offer of relocation assistance, an adverse effect in the form excess cancer risk above air district thresholds would occur. Therefore, this effect would be adverse. If, however, all landowners accept DWR's offer of relocation assistance, effects would not be adverse.

CEQA Conclusion**:** DPM generated during construction poses inhalation-related chronic non-cancer hazard and cancer risk if adjacent receptors are exposed to significant concentrations for prolonged durations. DPM generated during Alternative 6C construction would not exceed the BAAQMD's chronic non-cancer hazard threshold; however, it would exceed the BAAQMD's cancer thresholds. Therefore, this impact for DPM emissions would be significant.

Mitigation Measure AQ-16 would be available to reduce exposure to substantial cancer risk by relocating affected receptors. Although Mitigation Measure AQ-16 would reduce the severity of this effect, the BDCP proponents are not solely responsible for implementation of the measure. If a landowner chooses not to accept DWR's offer of relocation assistance, a significant impact in the form excess cancer risk above air district thresholds would occur. Therefore, this effect would be significant and unavoidable. If, however, all landowners accept DWR's offer of relocation assistance, the impact would be less than significant.

Mitigation Measure AQ-16: Relocate Sensitive Receptors to Avoid Excess Cancer Risk

Please see Mitigation Measure AQ-16 under Impact AQ-16 in the discussion of Alternative 1A.

Impact AQ-17: Exposure of Sensitive Receptors to Health Hazards from Diesel Particulate Matter in Excess of SJVAPCD's Chronic Non-Cancer and Cancer Risk Thresholds

NEPA Effects: Construction of Alternative 6C would occur in the SMAQMD, YSAQMD, and BAAQMD. No construction emissions would be generated in the SJVAPCD. Consequently, Alternative 1C would not expose receptors to increased health risks from DPM since there would be no emissions. There would be no adverse effect.

CEQA Conclusion: Construction of Alternative 6C would occur in the SMAQMD, YSAQMD, and BAAQMD. No construction emissions would be generated in the SJVAPCD. Consequently, Alternative 1C would not expose receptors to increased health risks from DPM since there would be no emissions. This impact would be less than significant. No mitigation is required.

Impact AQ-18: Exposure of Sensitive Receptors to *Coccidioides immitis* (Valley Fever)

NEPA Effects: As discussed under Alternative 1A, earthmoving activities during construction could release *C. immitis* spores if filaments are present and other soil chemistry and climatic conditions are conducive to spore development. Receptors adjacent to the construction area may therefore be exposed to increase risk of inhaling *C. immitis* spores and subsequent development of Valley Fever. Dust-control measures are the primary defense against infection (United States Geological Survey 2000). Implementation of advanced air-district recommended fugitive dust controls outlined in Appendix 3B, *Environmental Commitments*, would avoid dusty conditions and reduce the risk of contracting Valley Fever through routine watering and other controls. Therefore, this alternative's effect of exposure of sensitive receptors to increased Valley Fever risk during construction would not be adverse.

CEQA Conclusion: Construction of the water conveyance facility would involve earthmoving activities that could release *C. immitis* spores if filaments are present and other soil chemistry and climatic conditions are conducive to spore development. Receptors adjacent to the construction area may therefore be exposed to increase risk of inhaling *C. immitis* spores and subsequent development of Valley Fever. Implementation of air-district recommended fugitive dust controls outlined in Appendix 3B, *Environmental Commitments*, would avoid dusty conditions and reduce the risk of contracting Valley Fever through routine watering and other controls. Therefore, this impact would be less than significant. No mitigation is required.

Impact AQ-19: Creation of Potential Odors Affecting a Substantial Number of People during Construction or Operation of the Proposed Water Conveyance Facility

NEPA Effects: As discussed under Alternative 1A, odors from construction activities would be localized and generally confined to the immediate area surrounding the construction site. Moreover, odors would be temporary and localized, and they would cease once construction activities have been completed. Thus, it is not anticipated that construction of CM1 would create objectionable odors from construction equipment or asphalt paving.

Construction of the water conveyance facility would require removal of subsurface material during tunnel excavation and sediment removal. As discussed under Alternative 1A, geotechnical tests indicate that VOC levels in Plan Area soils are below the method detection limits, indicating that organic decay of exposed RTM and sediment will be relatively low (URS 2014). Moreover, drying and stockpiling of the removed RTM and sediment will occur under aerobic conditions, which will further limit any potential decomposition and associated malodorous products. Accordingly, it is not anticipated that tunnel and sediment excavation would create objectionable odors.

Typical facilities known to produce odors include landfills, wastewater treatment plants, food processing facilities, and certain agricultural activities. Alternative 6C would not result in the addition of facilities associated with odors, and as such, long-term operation of the water conveyance facility would not result in objectionable odors.

***CEQA Conclusion*:** Alternative 6C would not result in the addition of major odor producing facilities. Diesel emissions during construction could generate temporary odors, but these would quickly dissipate and cease once construction is completed. Likewise, potential odors generated during asphalt paving would be addressed through mandatory compliance with air district rules and regulations. While tunnel excavation would unearth substantial quantities of RTM, geotechnical tests indicate that soils in the Plan Area have relatively low organic constituents. Moreover, drying and stockpiling of the removed RTM will occur under aerobic conditions, which will further limit any potential decomposition and associated malodorous products. Accordingly, the impact of exposure of sensitive receptors to potential odors during construction would be less than significant. No mitigation is required.

Impact AQ-20: Generation of Criteria Pollutants in the Excess of Federal *De Minimis* Thresholds from Construction and Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: As discussed above, emissions generated by Alternative 1C within the SFNA and SFBAAB would be representative of emissions generated by Alternative 6C (refer to Table 22-56). No emissions would be generated within the SJVAB and as such, the project would conform to the appropriate SJVAB SIPs.

Sacramento Federal Nonattainment Area

As shown in Table 22-56, implementation of Alternative 1C (and thus Alternative 6C) would exceed the following SFNA federal *de minimis* thresholds:

- ROG: 2019–2025
- NO_X: 2018–2028

ROG and NO_X are precursors to ozone and NO_X is a precursor to PM, for which the SFNA is in nonattainment for the NAAQS. Since project emissions exceed the federal *de minimis* thresholds for ROG and NO_X, a general conformity determination must be made to demonstrate that total direct and indirect emissions of ROG and NO_X would conform to the appropriate SFNA SIP for each year of construction in which the *de minimis* thresholds are exceeded.

NO_X is also a precursor to PM and can contribute to PM formation. As discussed above, Sacramento County is currently designated maintenance for the PM10 NAAQS and portions of the SVAB are designated nonattainment for the PM2.5 NAAQS. NO_X emissions in excess of 100 tons per year in Sacramento County trigger a secondary PM10 precursor threshold, whereas NO_X emissions in excess of 100 tons per year in the SVAB trigger a secondary PM2.5 precursor threshold. Since NO_X emissions can contribute to PM formation, NO_X emissions in excess of these secondary precursor thresholds could conflict with the applicable PM10 and PM2.5 SIPs. Accordingly, NO_X offsets pursued for the purposes of general conformity for those years in which NO_X emissions exceed 100 tons must occur within the federally designated PM2.5 nonattainment and PM10 maintenance areas of the SVAB.

As shown in Table 22-48, NO_X emissions generated by construction activities in SMAQMD (Sacramento County) would not exceed 100 tons per year. Accordingly, the project does not trigger the secondary PM10 precursor threshold. As shown in Table 22-56, NO_X emissions in 2019 through 2027 would exceed 100 tons year in the SFNA. The project therefore triggers the secondary PM2.5 precursor threshold, requiring all NO_X offsets for 2019 through 2027 to occur within the federally designated PM2.5 nonattainment area within the SFNA. The nonattainment boundary for PM2.5 includes all of Sacramento County and portions of Yolo, El Dorado, Solano, and Placer counties.

The federal lead agencies (Reclamation, USFWS, and NMFS) demonstrate that project emissions would not result in a net increase in regional NO_X emissions, as construction-related NO_X would be fully offset to zero through implementation of Mitigation Measures AQ-1a and 1b, which require additional onsite mitigation and/or offsets. Mitigation Measures AQ-1a and 1b will ensure the requirements of the mitigation and offset program are implemented and conformity requirements for NO_X are met.

Mitigation Measure AQ-1a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-1a under Impact AQ-1 in the discussion of Alternative 1A.

Mitigation Measure AQ-1b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-1b under Impact AQ-1 in the discussion of Alternative 1A.

San Francisco Bay Area Air Basin

As shown in Table 22-56, implementation of Alternative 1C (and thus Alternative 6C) would exceed the following SFBAAB federal *de minimis* thresholds:

- NO_X: 2019–2024

NO_X is a precursor to ozone, for which the SJVAB is in nonattainment for the NAAQS. Since project emissions exceed the federal *de minimis* threshold for NO_X, a general conformity determination must be made to demonstrate that total direct and indirect emissions of NO_X would conform to the appropriate SJVAB SIP for each year of construction in which the *de minimis* thresholds are exceeded.

NO_X is also a precursor to PM and can contribute to PM formation. As discussed above, the SFBAAB is currently designated nonattainment for the PM2.5 NAAQS. NO_X emissions in excess of 100 tons per year trigger a secondary PM precursor threshold, and could conflict with the applicable PM2.5 SIP. Accordingly, NO_X offsets pursued for the purposes of general conformity for those years in which NO_X emissions exceed 100 tons must occur within the federally designated PM2.5 nonattainment area of the SFBAAB, which is consistent with the larger nonattainment boundary for ozone.

Although Mitigation Measures AQ-3a and AQ-3b would reduce NO_X, given the magnitude of emissions; neither measure could feasibly reduce emissions to net zero. This impact would be adverse. In the event that Alternative 6C is selected as the APA, Reclamation, USFWS, and NMFS would need to demonstrate that conformity is met for NO_X through a local air quality modeling analysis (i.e., dispersion modeling) or other acceptable methods to ensure project emissions do not cause or contribute to any new exceedances of the NAAQS or increase the frequency or severity of any existing exceedances.

Mitigation Measure AQ-3a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the BAAQMD/SFBAAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable BAAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-3a under Impact AQ-3 in the discussion of Alternative 1A.

Mitigation Measure AQ-3b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the BAAQMD/SFBAAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable BAAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-3b under Impact AQ-3 in the discussion of Alternative 1A.

CEQA Conclusion: SFNA and SFBAAB are classified as nonattainment areas with regard to the ozone NAAQS. The impact of increases in criteria pollutant emissions above the air basin *de minimis* thresholds could conflict with or obstruct implementation of the applicable air quality plans. Since construction emissions in the SFNA and SFBAAB would exceed the *de minimis* thresholds for ROG (SFNA only) and NO_X, this impact would be significant.

Mitigation Measures AQ-1a and AQ-1bwould ensure project emissions would not result in an increase in regional ROG or NO_X emissions in the SFNA. These measures would therefore ensure total direct and indirect ROG and NO_X emissions generated by the project in the SFNA would conform to the appropriate air basin SIPs by offsetting the action's emissions in the same or nearby area to net zero.

Although Mitigation Measures AQ-3a and AQ-3b would reduce NO_X in the SFBAAB, given the magnitude of emissions; neither measure could feasibly reduce emissions to net zero. This impact would be significant and unavoidable.

No emissions would be generated within the SJVAB and as such, the project would conform to the appropriate SJVAB SIPs.

Impact AQ-21: Generation of Cumulative Greenhouse Gas Emissions during Construction of the Proposed Water Conveyance Facility

NEPA Effects: Construction activity required for Alternative 6C was assumed to equal activity required for Alternative 1C. Emissions generated by Alternative 1C would therefore be representative of emissions generated by Alternative 6C (see Table 22-57). As shown in Table 22-57, construction of Alternative 6C would generate a total of 2.5 million metric tons of GHG emissions. As discussed in section 22.3.2, *Determination of Effects*, any increase in emissions above net zero associated with construction of the BDCP water conveyance features would be adverse. Accordingly, this effect would be adverse. Mitigation Measure AQ-21, which would develop a GHG Mitigation Program to reduce construction-related GHG emissions to net zero, is available address this effect.

***CEQA Conclusion*:** Construction of Alternative 6C would generate a total of 2.5 million metric tons of GHG emissions. This is equivalent to adding 518,000 typical passenger vehicles to the road during construction (U.S. Environmental Protection Agency 2014e). As discussed in section 22.3.2, *Determination of Effects*, any increase in emissions above net zero associated with construction of the BDCP water conveyance features would be significant. Mitigation Measure AQ-21 would develop a GHG Mitigation Program to reduce construction-related GHG emissions to net zero. Accordingly, this impact would be less-than-significant with implementation of Mitigation Measure AQ-21.

Mitigation Measure AQ-21: Develop and Implement a GHG Mitigation Program to Reduce Construction Related GHG Emissions to Net Zero (0)

Please see Mitigation Measure AQ-21 under Impact AQ-21 in the discussion of Alternative 1A.

Impact AQ-22: Generation of Cumulative Greenhouse Gas Emissions from Operation and Maintenance of the Proposed Water Conveyance Facility and Increased Pumping

NEPA Effects: Operation of Alternative 6C would generate direct and indirect GHG emissions. Sources of direct emissions include heavy-duty equipment, on road crew trucks, and employee vehicle traffic. Indirect emissions would be generated predominantly by electricity consumption required for pumping as well as, maintenance, lighting, and other activities.

Table 22-129 summarizes long-term operational GHG emissions associated with operations, maintenance, and increased SWP pumping. Emissions were quantified for both ELT and LLT conditions, although activities would take place annually until project decommissioning. Emissions include state mandates to reduce GHG emissions (described in Impact AQ-21) are presented (there are no BDCP specific operational environmental commitments). Total CO_2e emissions are compared to both the No Action Alternative (NEPA point of comparison) and Existing Conditions (CEQA baseline). As discussed in Section 22.3.1.2, equipment emissions are assumed to be zero under both the No Action Alternative (NEPA point of comparison) and Existing Conditions (CEQA baseline). The equipment emissions presented in Table 22-129 are therefore representative of project impacts for both the NEPA and CEQA analysis.

Table 22-129. GHG Emissions from Operation, Maintenance, and Increased SWP Pumping, Alternative 6C (metric tons/year)

		Electricity CO_{2e}		Total CO_2e	
Condition	Equipment CO_2e	NEPA Point of Comparison	CEQA Baseline	NEPA Point of Comparison	CEQA Baseline
ELT	526	-	-100,071	-	-99,545
LLT	513	-13,929	-40,195	-13,416	-39,682

Note: The *NEPA point of comparison* compares total CO_2e emissions after implementation of Alternative 6C to the No Action Alternative, whereas the *CEQA baseline* compares total CO_2e emissions to Existing Conditions. Negative values represent a net GHG reduction.

Table 22-59 summarizes equipment CO_2e emissions that would be generated in the BAAQMD, SMAQMD, and SJVAPCD (no emissions would be generated in the YSAQMD). The table does not include emissions from concrete absorption or SWP pumping as these emissions would be generated by power plants located throughout the state (see discussion preceding this impact analysis). GHG emissions presented in Table 22-59 are therefore provided for information purposes only.

SWP Operational and Maintenance GHG Emissions Analysis

Alternative 6C would not add any additional net electricity demand to operation of the SWP and would in fact result in a net reduction in electricity demand (see Table 22-129). Therefore, there will be no impact on SWP operational emissions.

A small amount of additional GHG emissions from equipment would be emitted as a result of the maintenance of new facilities associated with Alternative 6C (Table 22-129). Emissions from additional maintenance activities would become part of the overall DWR maintenance program for the SWP and would be managed under DWR's CAP.

The CAP sets forth DWR's plan to manage its activities and operations to achieve its GHG emissions reduction goals. The CAP commits DWR to monitoring its emissions each year and evaluating its emissions every five years to determine whether it is on a trajectory to achieve its GHG emissions reduction goals. If it appears that DWR will not meet the GHG emission reduction goals established in the plan, DWR may make adjustments to existing emissions reduction measures, devise new measures to ensure achievement of the goals, or take other action.

Consistent with the analysis contained in the CAP and associated Initial Study and Negative Declaration for the CAP, BDCP Alternative 6C would not adversely affect DWR's ability to achieve the GHG emissions reduction goals set forth in the CAP. Further, Alternative 6C would not conflict with any of DWR's specific action GHG emissions reduction measures and implements all applicable project level GHG emissions reduction measures as set forth in the CAP. BDCP Alternative 6C is therefore consistent with the analysis performed in the CAP. There would be no adverse effect.

***CEQA Conclusion*:** SWP GHG emissions currently are below 1990 levels and achievement of the goals of the CAP means that total DWR GHG emissions will be reduced to 50% of 1990 levels by 2020 and to 80% of 1990 levels by 2050. The implementation of BDCP Alternative 6C would not affect DWR's established emissions reduction goals or baseline (1990) emissions and therefore would not result in a change in total DWR emissions that would be considered significant. Prior adoption of the CAP by DWR already provides a commitment on the part of DWR to make all necessary modifications to DWR's REPP (as described above) or any other GHG emission reduction measure in the CAP that are necessary to achieve DWR's GHG emissions reduction goals. Therefore no amendment to the approved CAP is necessary to ensure the occurrence of the additional GHG emissions reduction activities needed to account for BDCP-related operational or maintenance emissions. The effect of BDCP Alternative 6C with respect to GHG emissions is less than cumulatively considerable and therefore less than significant. No mitigation is required.

Impact AQ-23: Generation of Cumulative Greenhouse Gas Emissions from Increased CVP Pumping as a Result of Implementation of CM1

NEPA Effects: As previously discussed, DWR's CAP cannot be used to evaluate environmental impacts associated with increased CVP pumping, as emissions associated with CVP are not under DWR's control and are not included in the CAP. Accordingly, GHG emissions resulting from increased CVP energy use are evaluated separately from GHG emissions generated as a result of SWP energy use.

Under Alternative 6C, operation of the CVP yields the generation of clean, GHG emissions-free, hydroelectric energy. This electricity is sold into the California electricity market or directly to energy users. Analysis of the existing and future no action condition indicates that the CVP generates and will continue to generate all of the electricity needed to operate the CVP system and approximately 3,500 GWh of excess hydroelectric energy that would be sold to energy users throughout California.

Implementation of Alternative 6C is neither expected to require additional electricity over the No Action Alternative nor reduce the amount of excess CVP generation available for sale from the CVP to electricity users. The CVP is operated using energy generated at CVP hydroelectric facilities and therefore results in no GHG emissions. Rather, implementation of Alternative 6C would reduce GHG emissions by 24,398 to 31,398 metric tons of CO_2e, relative to the No Action Alternative (depending on whether the RPS is assumed in the emissions calculations). Accordingly, there would be no adverse effect.

CEQA Conclusion: Implementation of Alternative 6C is neither expected to require additional electricity over Existing Conditions nor reduce the amount of excess CVP generation available for sale from the CVP to electricity users. All power supplied to CVP facilities would continue to be supplied by GHG emissions-free hydroelectricity and there would be no increase in GHG emissions over Existing Conditions as a result of CVP operations. The impact would be less than significant and no mitigation is required.

Impact AQ-24: Generation of Regional Criteria Pollutants from Implementation of CM2–CM11

NEPA Effects: Table 22-29 summarizes potential construction and operational emissions that may be generated by implementation of CM2–CM11. See the discussion of Impact AQ-24 under Alternative 1A.

Criteria pollutants from restoration and enhancement actions could exceed applicable general conformity *de minimis* levels and applicable local thresholds. The effect would vary according to the equipment used in construction of a specific conservation measure, the location, the timing of the actions called for in the conservation measure, and the air quality conditions at the time of implementation; these effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. The effect of increases in emissions during implementation of CM2–CM11 in excess of applicable general conformity *de minimis* levels and air district regional thresholds (Table 22-8) could violate air basin SIPs and worsen existing air quality conditions. Mitigation Measure AQ-24 would be available to reduce this effect, but emissions would still be adverse.

CEQA Conclusion: Construction and operational emissions associated with the restoration and enhancement actions would result in a significant impact if the incremental difference, or increase, relative to Existing Conditions exceeds the applicable local air district thresholds shown in Table 22-8; these effects are expected to be further evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measure AQ-24 would be available to reduce this effect, but may not be sufficient to reduce emissions below applicable air quality management district thresholds (see Table 22-8). Consequently, this impact would be significant and unavoidable.

Mitigation Measure AQ-24: Develop an Air Quality Mitigation Plan (AQMP) to Ensure Air District Regulations and Recommended Mitigation are Incorporated into Future Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-24 under Impact AQ-18 in the discussion of Alternative 1A.

Impact AQ-25: Exposure of Sensitive Receptors to Health Hazards from Localized Particulate Matter, Carbon Monoxide, and Diesel Particulate Matter from Implementation of CM2–CM11

NEPA Effects: The potential for Alternative 6C to expose sensitive receptors increased health hazards from localized PM, CO, and DPM would be similar to Alternative 1A. Activities shown in Table 22-29 with the greatest potential to have short or long-term air quality impacts are also anticipated to have the greatest potential to expose receptors to substantial pollutant concentrations. The effect would vary according to the equipment used, the location and timing of the actions called for in the conservation measure, the meteorological and air quality conditions at the time of implementation, and the location of receptors relative to the emission source. Potential health effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions.

The effect of increases in PM, CO, or DPM (cancer and non-cancer-risk) in excess of applicable air district thresholds (Table 22-8) at receptor locations could result in adverse health impacts. Mitigation Measures AQ-24 and AQ-25 would be available to reduce this effect.

***CEQA Conclusion*:** Construction and operational emissions associated with the restoration and enhancement actions under Alternative 6C would result in a significant impact if PM, CO, or DPM (cancer and non-cancer-risk) concentrations at receptor locations exceed the applicable local air district thresholds shown in Table 22-8; these effects are expected to be further evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measures AQ-24 and AQ-25 would ensure localized concentrations at receptor locations would be below applicable air quality management district thresholds (see Table 22-8). Consequently, this impact would be less than significant.

Mitigation Measure AQ-24: Develop an Air Quality Mitigation Plan (AQMP) to Ensure Air District Regulations and Recommended Mitigation are Incorporated into Future Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-24 under Impact AQ-24 in the discussion of Alternative 1A.

Mitigation Measure AQ-25: Prepare a Project-Level Health Risk Assessment to Reduce Potential Health Risks from Exposure to Localized DPM and PM Concentrations

Please see Mitigation Measure AQ-25 under Impact AQ-25 in the discussion of Alternative 1A.

Impact AQ-26: Creation of Potential Odors Affecting a Substantial Number of People from Implementation of CM2–CM11

NEPA Effects: The potential for Alternative 6C to expose sensitive receptors increased odors would be similar to Alternative 1A. Accordingly, construction activities associated with CM2–CM11 are not anticipated to result in nuisance odors. Similarly, while restored land uses associated with the program have the potential to generate odors from natural processes, the emissions would be similar in origin and magnitude to the existing land use types in the restored area (e.g., managed wetlands). Moreover, specific odor effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Accordingly, odor-related effects associated with CM2–CM11 would not be adverse.

***CEQA Conclusion*:** Alternative 6C would not result in the addition of major odor producing facilities. Diesel emissions during construction could generate temporary odors, but these would quickly dissipate and cease once construction is completed. Increases in wetland, tidal, and upland habitats may increase the potential for odors from natural processes. However, the origin and magnitude of odors would be similar to the existing land use types in the restored area (e.g., managed wetlands). Moreover, specific odor impacts would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Accordingly, the impact of exposure of sensitive receptors to potential odors would be less than significant. No mitigation is required.

Impact AQ-27: Generation of Cumulative Greenhouse Gas Emissions from Implementation of CM2–CM11

NEPA Effects: CM2–CM11 implemented under Alternative 6C would result in local GHG emissions from construction equipment and vehicle exhaust. Restoration activities with the greatest potential for emissions include those that break ground and require use of earthmoving equipment. The type of restoration action and related construction equipment use are shown in Table 22-29. Implementing CM2–CM11 would also affect long-term sequestration rates through land use changes, such as conversion of agricultural land to wetlands, inundation of peat soils, drainage of peat soils, and removal or planting of carbon-sequestering plants.

Without additional information on site-specific characteristics associated with each of the restoration components, a complete assessment of GHG flux from CM2–CM11 is currently not possible. The effect of carbon sequestration and CH_4 generation would vary by land use type, season, and chemical and biological characteristics; these effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measures AQ-24 and AQ-27 would be available to reduce this effect. However, due to the potential for increases in GHG emissions from construction and land use change, this effect would be adverse.

***CEQA Conclusion*:** The restoration and enhancement actions under Alternative 6C could result in a significant impact if activities are inconsistent with applicable GHG reduction plans, do not contribute to a lower carbon future, or generate excessive emissions, relative to other projects throughout the state. These effects are expected to be further evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measures AQ-24 and AQ-27 would be available to reduce this impact, but may not be sufficient to reduce to a less-than-significant level. Consequently, this impact would be significant and unavoidable.

Mitigation Measure AQ-24: Develop an Air Quality Mitigation Plan (AQMP) to Ensure Air District Regulations and Recommended Mitigation are Incorporated into Future Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-24 under Impact AQ-24 in the discussion of Alternative 1A.

Mitigation Measure AQ-27: Prepare a Land Use Sequestration Analysis to Quantify and Mitigate (as Needed) GHG Flux Associated with Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-27 under Impact AQ-27 in the discussion of Alternative 1A.

22.3.3.14 Alternative 7—Dual Conveyance with Tunnel, Intakes 2, 3, and 5, and Enhanced Aquatic Conservation (9,000 cfs; Operational Scenario E)

For the purposes of this analysis, it was assumed that Intakes 2, 3, and 5 would be constructed under Alternative 7. Under this alternative, an intermediate forebay would also be constructed, and the conveyance facility would be a buried pipeline and tunnels (Figures 3-2 and 3-11 in Chapter 3, *Description of Alternatives*).

Construction and operation of Alternative 7 would require the use of electricity, which would be supplied by the California electrical grid. Power plants located throughout the state supply the grid with power, which will be distributed to the Study area to meet project demand. Power supplied by statewide power plants will generate criteria pollutants. Because these power plants are located throughout the state, criteria pollutant emissions associated with Alternative 7 electricity demand cannot be ascribed to a specific air basin or air district within the Study area. Criteria pollutant emissions from electricity consumption, which are summarized in Table 22-130, are therefore provided for informational purposes only and are not included in the impact conclusion.

Table 22-130. Criteria Pollutant Emissions from Electricity Consumption: Construction and Net Project Operations, Alternative 7 (tons/year) [a,b]

Year	Analysis	ROG	CO	NO_X	PM10	PM2.5[c]	SO_2
2016	-	0	0	0	0	0	0
2017	-	0	0	0	0	0	0
2018	-	<1	<1	<1	<1	<1	<1
2019	-	<1	2	<1	<1	<1	1
2020	-	<1	12	1	1	1	5
2021	-	<1	32	2	3	3	13
2022	-	<1	45	3	4	4	19
2023	-	<1	40	3	3	3	17
2024	-	<1	42	3	4	4	18
2025	-	<1	28	2	2	2	12
2026	-	<1	10	1	1	1	4
2027	-	<1	2	<1	<1	<1	1
2028	-	<1	<1	<1	<1	<1	<1
2029	-	<1	<1	<1	<1	<1	<1
ELT	CEQA	-2	-17	-240	-20	-20	-101
LLT	NEPA	-1	-10	-132	-11	-11	-56
LLT	CEQA	-2	-22	-297	-25	-25	-125

NEPA = Compares criteria pollutant emissions after implementation of Alternative 7 to the No Action Alternative.

CEQA = Compares criteria pollutant emissions after implementation of Alternative 7 to Existing Conditions.

[a] Emissions assume implementation of RPS (see Appendix 22A, *Air Quality Analysis Methodology*). Power plants that generate electricity for the proposed project would be subject to local air district permitting requirements, including standards to implement BACT to reduce criteria pollutant emissions.

[b] Because GHG emissions are cumulative (see Section 22.3.2.1) and not evaluated at the local air basin or air district level, they are discussed in Impacts AQ-21 and AQ-22. The GHG analysis for SWP power utilizes actual and forecasted GHG emissions rates for the SWP system, which differs slightly from the above analysis. Statewide grid average emission factors were utilized for the above analysis as criteria pollutant emission factors for SWP were unavailable. Please also note that the above analysis does not account for additional renewable energy that will be procured through modifications to DWR's REPP (see Impact AQ-22). Accordingly, the emissions results presented above represent a conservative assessment of potential criteria pollutant emissions.

[c] Emission factors for PM2.5 are currently unavailable. Consequently, PM2.5 emissions were assumed to equal PM10 emissions. Because PM2.5 represents a fraction of PM10, this approach represents a conservative assessment of PM2.5 emissions from electricity consumption.

Construction activities would generate emissions of ozone precursors (ROG and NO_X), CO, PM10, PM2.5, and SO_2. Table 22-131 summarizes criteria pollutant emissions that would be generated in the BAAQMD, SMAQMD, SJVAPCD, and YSAQMD in pounds per day and tons per year. Emissions estimates include implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*). Although emissions are presented in different units (pounds and tons), the amounts of emissions are identical (i.e., 2,000 pounds is identical to 1 ton). Summarizing emissions in both pounds per day and tons per year is necessary to evaluate project-level effects against the appropriate air district thresholds, which are given in both pounds and tons (see Table 22-8).

As shown in Appendix 22B, *Air Quality Assumptions*, construction activities during several phases will likely occur concurrently. To ensure a conservative analysis, the maximum daily emissions during these periods of overlap were estimated assuming all equipment would operate at the same time—this gives the maximum total project-related air quality impact during construction. Accordingly, the daily emissions estimates represent a conservative assessment of construction impacts. Exceedances of the air district thresholds are shown in <u>underlined</u> text.

Table 22-131. Criteria Pollutant Emissions from Construction of Alternative 7 (pounds/day and tons/year)

	Maximum Daily Emissions (pounds/day)										Annual Emissions (tons/year)									
	Bay Area Air Quality Management District										Bay Area Air Quality Management District									
	ROG	NO_X	CO	PM10			PM2.5			SO_2	ROG	NO_X	CO	PM10			PM2.5			SO_2
Year				Exhaust	Dust	Total	Exhaust	Dust	Total					Exhaust	Dust	Total	Exhaust	Dust	Total	
2016	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2017	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2018	7	128	42	<1	88	88	<1	22	23	1	<1	2	1	<1	1	1	<1	<1	<1	<1
2019	14	224	86	1	139	140	1	35	36	2	2	16	13	<1	3	3	<1	1	1	<1
2020	18	275	114	1	163	164	1	41	43	3	3	25	22	<1	5	5	<1	1	1	<1
2021	20	301	124	1	178	179	1	45	47	3	4	33	29	<1	6	7	<1	1	2	<1
2022	27	391	163	2	235	237	2	60	61	4	5	37	30	<1	9	9	<1	2	2	<1
2023	86	799	502	6	401	408	6	85	91	7	8	59	48	1	22	22	1	4	5	<1
2024	94	927	540	7	518	525	7	115	122	9	12	84	70	1	27	28	1	5	6	1
2025	89	896	503	6	489	495	6	111	117	9	7	51	43	1	18	19	<1	3	4	<1
2026	58	663	355	5	426	430	5	98	102	8	5	40	32	<1	17	17	<1	3	4	<1
2027	62	624	362	19	391	410	18	89	107	8	3	21	17	<1	14	14	<1	2	3	<1
2028	21	331	133	1	302	304	1	69	70	4	<1	2	1	<1	5	5	<1	1	1	<1
2029	8	154	49	1	113	113	1	29	30	2	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Thresholds	*54*	*54*	-	*82*	*BMPs*	-	*54*	*BMPs*	-	-	-	-	-	-	-	-	-	-	-	-
	Sacramento Metropolitan Air Quality Management District										Sacramento Metropolitan Air Quality Management District									
	ROG	NO_X	CO	PM10			PM2.5			SO_2	ROG	NO_X	CO	PM10			PM2.5			SO_2
Year				Exhaust	Dust	Total	Exhaust	Dust	Total					Exhaust	Dust	Total	Exhaust	Dust	Total	
2016	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2017	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2018	74	827	492	14	179	193	13	32	45	3	3	28	19	1	11	11	1	2	2	<1
2019	48	563	321	6	274	280	6	49	54	3	4	25	31	1	23	23	1	3	4	<1
2020	72	839	483	10	324	334	9	56	66	4	8	64	55	1	32	33	1	4	5	<1
2021	93	984	589	10	433	443	10	73	83	4	10	87	75	1	44	45	1	6	7	<1
2022	126	1,377	990	12	577	587	12	93	105	8	13	104	111	1	53	54	1	7	8	<1
2023	261	2,299	1,794	27	816	840	27	132	155	19	24	191	189	2	74	76	2	10	12	1
2024	391	3,529	2,439	46	1,100	1,146	44	186	230	22	32	239	220	3	87	90	3	12	16	1
2025	355	3,473	2,272	42	1,152	1,193	41	187	227	21	26	188	171	3	59	62	3	9	12	1
2026	258	2,161	1,440	28	644	672	27	125	152	16	24	167	152	3	53	56	3	8	11	1
2027	270	2,410	1,631	32	718	750	31	133	164	21	21	152	130	3	59	62	3	9	11	1
2028	107	1,025	632	7	503	510	7	93	100	6	5	37	34	<1	28	28	<1	4	5	<1
2029	22	331	164	2	171	173	2	38	40	3	<1	3	3	<1	3	3	<1	<1	<1	<1
Thresholds	-	*85*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Year	San Joaquin Valley Air Pollution Control District										San Joaquin Valley Air Pollution Control District									
	ROG	NO_X	CO	PM10			PM2.5			SO_2	ROG	NO_X	CO	PM10			PM2.5			SO_2
				Exhaust	Dust	Total	Exhaust	Dust	Total					Exhaust	Dust	Total	Exhaust	Dust	Total	
2016	0	0	0	0	29	29	0	4	4	0	0	0	0	0	2	2	0	<1	<1	0
2017	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2018	28	135	194	2	108	111	2	13	16	1	1	6	9	<1	10	11	<1	1	1	<1
2019	113	850	820	10	221	231	9	28	37	3	10	71	68	1	16	17	1	2	3	<1
2020	195	1,463	1,375	19	348	367	18	42	60	5	17	122	119	1	31	32	1	4	5	<1
2021	273	2,105	1,919	29	710	739	28	83	110	7	26	190	190	2	49	51	2	6	8	1
2022	214	1,453	1,597	17	307	324	16	39	55	5	25	162	183	2	29	31	2	4	6	1
2023	192	1,234	1,418	13	216	229	13	28	41	4	22	132	161	1	15	17	1	2	3	<1
2024	182	1,098	1,322	11	163	174	11	22	32	4	21	121	148	1	15	16	1	2	3	<1
2025	152	890	1,050	9	133	141	8	18	26	3	13	80	91	1	12	13	1	2	2	<1
2026	104	638	691	5	87	93	5	11	16	2	5	32	31	<1	3	3	<1	<1	1	<1
2027	12	93	99	2	30	33	2	4	6	<1	<1	<1	1	1	<1	1	1	<1	1	<1
2028	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2029	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Thresholds	-	-	-	-	-	-	-	-	-	-	*10*	*10*	-	-	-	*15*	-	-	*15*	-

Year	Yolo Solano Air Quality Management District										Yolo Solano Air Quality Management District									
	ROG	NO_X	CO	PM10			PM2.5			SO_2	ROG	NO_X	CO	PM10			PM2.5			SO_2
				Exhaust	Dust	Total	Exhaust	Dust	Total					Exhaust	Dust	Total	Exhaust	Dust	Total	
2016	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2017	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2018	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2019	4	94	20	<1	26	26	<1	7	7	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
2020	4	94	20	<1	26	26	<1	7	7	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
2021	6	144	31	<1	26	40	<1	10	11	1	<1	3	1	<1	1	1	<1	<1	<1	<1
2022	10	260	59	1	75	75	1	19	20	2	<1	11	2	<1	3	3	<1	1	1	<1
2023	13	292	78	1	105	106	1	27	28	2	<1	10	3	<1	3	3	<1	1	1	<1
2024	13	286	78	1	105	106	1	27	28	2	<1	9	2	<1	3	3	<1	1	1	<1
2025	13	268	75	1	101	102	1	26	27	2	<1	6	2	<1	2	2	<1	1	1	<1
2026	10	214	61	1	83	84	1	21	22	2	<1	6	2	<1	2	2	<1	1	1	<1
2027	10	208	61	1	83	84	1	21	22	2	<1	6	2	<1	2	2	<1	1	1	<1
2028	8	151	45	1	61	62	1	16	16	1	<1	6	2	<1	2	2	<1	1	1	<1
2029	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Thresholds	-	-	-	-	-	*80*	-	-	-	-	*10*	*10*	-	-	-	-	-	-	-	-

Operation and maintenance activities under Alternative 7 would result in emissions of ROG, NO_X, CO, PM10, PM2.5, and SO_2. Emissions were quantified for both ELT and LLT conditions, although activities would take place annually until project decommissioning. Future emissions, in general, are anticipated to lessen because of continuing improvements in vehicle and equipment engine technology.

Table 22-132 summarizes criteria pollutant emissions associated with operation of Alternative 7 in the BAAQMD, SMAQMD, and SJVAPCD in pounds per day and tons per year (no operational emissions would be generated in the YSAMQD). Although emissions are presented in different units (pounds and tons), the amounts of emissions are identical (i.e., 2,000 pounds is identical to 1 ton). Summarizing emissions in both pounds per day and tons per year is necessary to evaluate project-level effects against the appropriate air district thresholds, which are given in both pounds and tons (see Table 22-8).

Table 22-132. Criteria Pollutant Emissions from Operation of Alternative 7 (pounds per day and tons per year)

	Maximum Daily Emissions (pounds/day)						Annual Emissions (tons/year)					
	Bay Area Air Quality Management District						Bay Area Air Quality Management District					
Condition	ROG	NO_X	CO	PM10	PM2.5	SO_2	ROG	NO_X	CO	PM10	PM2.5	SO_2
ELT	3	19	32	6	2	<1	0.01	0.08	0.14	0.02	0.01	<0.01
LLT	3	16	31	6	1	<1	0.01	0.07	0.14	0.02	0.01	<0.01
Thresholds	*54*	*54*	-	*82*	*82*	-	-	-	-	-	-	
	Sacramento Metropolitan Air Quality Management District						Sacramento Metropolitan Air Quality Management District					
Condition	ROG	NO_X	CO	PM10	PM2.5	SO_2	ROG	NO_X	CO	PM10	PM2.5	SO_2
ELT	4	24	43	7	2	<1	0.14	0.82	1.69	0.28	0.08	<0.01
LLT	3	20	41	7	2	<1	0.12	0.69	1.61	0.27	0.07	<0.01
Thresholds	*65*	*65*	-	-	-	-	-	-	-	-	-	-
	San Joaquin Valley Air Pollution Control District						San Joaquin Valley Air Pollution Control District					
Condition	ROG	NO_X	CO	PM10	PM2.5	SO_2	ROG	NO_X	CO	PM10	PM2.5	SO_2
ELT	3	19	36	6	2	<1	0.01	0.07	0.13	0.02	<0.01	<0.01
LLT	3	16	33	6	1	<1	0.01	0.06	0.12	0.01	<0.01	<0.01
Thresholds	-	-	-	-	-	-	*10*	*10*	-	*15*	*15*	-

Impact AQ-1: Generation of Criteria Pollutants in Excess of the SMAQMD Regional Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: As shown in Table 22-131, construction emissions would exceed SMAQMD's daily NO_X threshold for all years between 2018 and 2029, even with implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*). All other pollutants would be below air district thresholds and therefore would not result in an adverse air quality effect.

Since NO_X is a precursor to ozone and PM, exceedances of SMAQMD's daily NO_X threshold could impact both regional ozone and PM formation, which could worsen regional air quality and air basin attainment of the NAAQS and CAAQS.

While equipment could operate at any work area identified for this alternative, the highest level of NO_X emissions in the SMAQMD is expected to occur at those sites where the duration and intensity of construction activities would be greatest. This includes all intake and intake pumping plant sites along the east bank of the Sacramento River, as well as the intermediate forebay (and pumping plant) site west of South Stone Lake and east of the Sacramento River.

Environmental commitments will reduce construction-related emissions; however, as shown in Table 22-131, NO_X emissions would still exceed SMAQMD's threshold identified in Table 22-8 and would result in an adverse effect to air quality. Mitigation Measures AQ-1a and AQ-1b would be available to reduce NO_X emissions, and would thus address regional effects related to secondary ozone and PM formation.

***CEQA Conclusion*:** NO_X emissions generated during construction would exceed SMAQMD regional threshold identified in Table 22-8. Since NO_X is a precursor to ozone and PM, exceedances of SMAQMD's daily NO_X threshold could impact both regional ozone and PM formation. SMAQMD's regional emissions thresholds (Table 22-8) and PM10 screening criteria have been adopted to ensure projects do not hinder attainment of the CAAQS or NAAQS. The impact of generating NO_X emissions in excess of local air district thresholds would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. This would be a significant impact. Mitigation Measures AQ-1a and AQ-1b would be available to reduce NO_X emissions to a less-than-significant level by offsetting emissions to quantities below SMAQMD CEQA thresholds (see Table 22-8).

Mitigation Measure AQ-1a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-1a under Impact AQ-1 in the discussion of Alternative 1A.

Mitigation Measure AQ-1b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-1b under Impact AQ-1 in the discussion of Alternative 1A.

Impact AQ-2: Generation of Criteria Pollutants in Excess of the YSAQMD Regional Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: As shown in Table 22-131, construction emissions would exceed YSAQMD regional thresholds for the following pollutants and years, even with implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*). All other pollutants would be below air district thresholds and therefore would not result in an adverse air quality effect.

- NO_X: 2022
- PM10: 2023–2027

Since NO_X is a precursor to ozone and NO_X is a precursor to PM, exceedances of YSAQMD's NO_X threshold could impact both regional ozone and PM formation, which could worsen regional air quality and air basin attainment of the NAAQS and CAAQS. Similarly, exceedances of YSAQMD's PM10 threshold could impede attainment of the NAAQS and CAAQS for PM10. All emissions generated within YSAQMD are a result of haul truck movement for equipment and material delivery.

Environmental commitments outlined in Appendix 3B, *Environmental Commitments,* will reduce construction-related emissions; however, as shown in Table 22-131, NO_X and PM10 emissions would still exceed the applicable YSAQMD thresholds identified in Table 22-8 and result in an adverse regional effect to air quality. Mitigation Measures AQ-1a and AQ-1b are available to reduce NO_X and PM10 emissions, and would thus address regional effects related to secondary ozone and PM formation.

***CEQA Conclusion*:** Emissions of NO_X and PM10 generated during construction would exceed YSAQMD's regional thresholds identified in Table 22-8. Since NO_X is a precursor to ozone and NO_X is a precursor to PM, exceedances of YSAQMD's NO_X threshold could impact both regional ozone and PM formation, which could worsen regional air quality and air basin attainment of the NAAQS and CAAQS. Similarly, exceedances of YSAQMD's PM10 threshold could impede attainment of the NAAQS and CAAQS for PM10. YSAQMD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS or NAAQS. The impact of generating NO_X and PM10 in excess of local air district regional thresholds would therefore violate applicable air quality standards in the study area and could contribute to or worsen an existing air quality conditions. This would be a significant impact. Mitigation Measures AQ-1a and AQ-1b would be available to reduce NO_X and PM10 emissions to a less-than-significant level by offsetting emissions to quantities below YSAQMD CEQA thresholds (see Table 22-8).

Mitigation Measure AQ-1a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-1a under Impact AQ-1 in the discussion of Alternative 1A.

Mitigation Measure AQ-1b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-1b under Impact AQ-1 in the discussion of Alternative 1A.

Impact AQ-3: Generation of Criteria Pollutants in Excess of the BAAQMD Regional Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: As shown in Table 22-131, construction emissions would exceed BAAQMD's daily thresholds for the following pollutants and years, even with implementation of environmental commitments. All other pollutants would be below air district thresholds and therefore would not result in an adverse air quality effect.

- ROG: 2023–2027

- NO_X: 2018–2029

Since ROG and NO_X are precursors to ozone and NO_X is a precursor to PM, exceedances of BAAQMD's ROG and NO_X thresholds could impact both regional ozone and PM formation, which could worsen regional air quality and air basin attainment of the NAAQS and CAAQS.

While equipment could operate at any work area identified for this alternative, the highest level of ROG and NO_X emissions in the BAAQMD are expected to occur at those sites where the duration and intensity of construction activities would be greatest, including the site of the Byron Tract Forebay adjacent to and south of Clifton Court Forebay.

Environmental commitments outlined in Appendix 3B, *Environmental Commitments,* will reduce construction-related emissions; however, as shown in Table 22-131, ROG and NO_X emissions would still exceed the applicable air district thresholds identified in Table 22-8 and would result in an adverse effect to air quality. Mitigation Measures AQ-3a and AQ-3b are available to reduce ROG and NO_X emissions, and would thus address regional effects related to secondary ozone and PM formation.

CEQA Conclusion**:** Emissions of ROG and NO_X generated during construction would exceed BAAQMD thresholds identified in Table 22-8. Since ROG and NO_X are precursors to ozone and NO_X is a precursor to PM, exceedances of BAAQMD's ROG and NO_X thresholds could impact both regional ozone and PM formation. BAAQMD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS or NAAQS. The impact of generating ROG and NO_X emissions in excess of local air district thresholds would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. This would be a significant impact. Mitigation Measures AQ-3a and AQ-3b would be available to reduce ROG and NO_X emissions to a less-than-significant level by offsetting emissions to quantities below BAAQMD CEQA thresholds (see Table 22-8).

Mitigation Measure AQ-3a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within BAAQMD/SFBAAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable BAAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-3a under Impact AQ-3 in the discussion of Alternative 1A.

Mitigation Measure AQ-3b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the BAAQMD/SFBAAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable BAAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-3b under Impact AQ-3 in the discussion of Alternative 1A.

Impact AQ-4: Generation of Criteria Pollutants in Excess of the SJVAPCD Regional Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: As shown in Table 22-131, construction emissions would exceed SJVAPCD's regional thresholds for the following years and pollutants, even with implementation of environmental commitments. All other pollutants would be below air district thresholds and therefore would not result in an adverse air quality effect.

- ROG: 2020–2025
- NO_X: 2019–2026
- PM10: 2019–2024

Since ROG and NO_X are precursors to ozone and NO_X is a precursor to PM, exceedances of SJVAPCD's ROG and NO_X thresholds could impact both regional ozone and PM formation, which could worsen regional air quality and air basin attainment of the NAAQS and CAAQS. Similarly, exceedances of SJVAPCD's PM10 threshold could impede attainment of the NAAQS and CAAQS for PM10.

While equipment could operate at any work area identified for this alternative, the highest level of ROG, NO_X, and PM10 emissions in the SJVAPCD is expected to occur at those sites where the duration and intensity of construction activities would be greatest. This includes all temporary and permanent utility sites, as well as all construction sites along the pipeline/tunnel conveyance alignment. For a map of the proposed tunnel alignment, see Mapbook Figure M3-1.

Environmental commitments outlined in Appendix 3B, *Environmental Commitments,* will reduce construction-related emissions; however, as shown in Table 22-131, ROG, NO_X, and PM10 emissions would still exceed SJVAPCD's thresholds identified in Table 22-8 and would result in an adverse effect to air quality. Mitigation Measures AQ-4a and AQ-4b are available to reduce ROG, NO_X, and PM10 emissions, and would thus address regional effects related to secondary ozone and PM formation.

CEQA Conclusion**:** Emissions of ROG, NO_X, and PM10 generated during construction would exceed SJVAPCD's annual significance threshold identified in Table 22-8. Since ROG and NO_X are precursors to ozone and NO_X is a precursor to PM, exceedances of SJVAPCD's ROG and NO_X thresholds could impact both regional ozone and PM formation, which could worsen regional air quality and air basin attainment of the NAAQS and CAAQS. Similarly, exceedances of SJVAPCD's PM10 threshold could impede attainment of the NAAQS and CAAQS for PM10. SJVAPCD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS or NAAQS. The impact of generating ROG, NO_X, and PM10 emissions in excess of local air district thresholds would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. This would be a significant impact. Mitigation Measures AQ-4a and AQ-4b would be available to reduce ROG, NO_X, and PM10 emissions to a less-than-significant level.

Mitigation Measure AQ-4a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4a under Impact AQ-4 in the discussion of Alternative 1A.

Mitigation Measure AQ-4b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4b under Impact AQ-4 in the discussion of Alternative 1A.

Impact AQ-5: Generation of Criteria Pollutants in Excess of the SMAQMD Regional Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance in SMAQMD could include both routine activities and yearly maintenance. Daily activities at all pumping plants and intakes are covered by maintenance, management, repair, and operating crews. Yearly maintenance would include annual, tunnel dewatering, and sediment removal (see Appendix 22A, *Air Quality Analysis Methodology,* for additional detail). The highest concentration of operational emissions in the SMAQMD are expected at intake and intake pumping plant sites along the east bank of the Sacramento River, as well as at the intermediate forebay (and pumping plant) site west of South Stone Lake and east of the Sacramento River. As shown in Table 22-132, operation and maintenance activities under Alternative 7 would not exceed SMAQMD's regional thresholds of significance and there would be no adverse effect (see Table 22-8). Accordingly, project operations under Alternative 7 would not contribute to or worsen existing air quality exceedances. There would be no adverse effect.

CEQA Conclusion**:** Emissions generated during operation and maintenance activities would not exceed SMAQMD regional thresholds for criteria pollutants. SMAQMD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS or NAAQS. The impact of generating emissions in excess of local air district would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Because project operations would not exceed SMAQMD regional thresholds, the impact would be less than significant. No mitigation is required.

Impact AQ-6: Generation of Criteria Pollutants in Excess of the YSAQMD Regional Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Alternative 7 would not construct any permanent features in the YSAQMD that would require routine operations and maintenance. No operational emissions would be generated in the YSAQMD. Consequently, operation of Alternative 7 would neither exceed the YSAQMD thresholds of significance nor result in an adverse effect on air quality.

CEQA Conclusion**:** No operational or maintenance emissions generated by the alternative would occur in YSAQMD and, therefore, YSAQMD's regional thresholds would not be exceeded (see Table 22-8). This impact would be less than significant. No mitigation is required.

Impact AQ-7: Generation of Criteria Pollutants in Excess of the BAAQMD Regional Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance in BAAQMD could include annual inspections, tunnel dewatering, and sediment removal (see Appendix 22A, *Air Quality Analysis Methodology,* for additional detail). The highest concentration of operational emissions in the BAAQMD are expected at the Byron Tract Forebay (including control gates), which is adjacent to and south of Clifton Court Forebay. As shown in Table 22-132, operation and maintenance activities under Alternative 7 would not exceed BAAQMD's regional thresholds of significance (see Table 22-8). Thus, project operations under Alternative 7 would not contribute to or worsen existing air quality exceedances. There would be no adverse effect.

CEQA Conclusion**:** Emissions generated during operation and maintenance activities would not exceed BAAQMD regional thresholds for criteria pollutants. BAAQMD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the

CAAQS or NAAQS. The impact of generating emissions in excess of local air district thresholds would violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Because project operations would not exceed BAAQMD regional thresholds, the impact would be less than significant. No mitigation is required.

Impact AQ-8: Generation of Criteria Pollutants in Excess of the SJVAPCD Regional Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance in SJVAPCD could include annual inspections and tunnel dewatering (see Appendix 22A, *Air Quality Analysis Methodology,* for additional detail). The highest concentration of operational emissions in the SJVPACD is expected at construction sites along the pipeline/tunnel conveyance alignment. For a map of the proposed tunnel alignment, see Mapbook Figure M3-1. As shown in Table 22-132, operation and maintenance activities under Alternative 7 would not exceed SJVAPCD's regional thresholds of significance (see Table 22-8). Accordingly, project operations under Alternative 7 would not contribute to or worsen existing air quality exceedances. There would be no adverse effect.

***CEQA Conclusion*:** Emissions generated during operation and maintenance activities would not exceed SJVAPCD's regional thresholds of significance. SJVAPCD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS or NAAQS. The impact of generating emissions in excess of local air district thresholds would violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Because project operations would not exceed SJVAPCD regional thresholds, the impact would be less than significant. No mitigation is required.

Impact AQ-9: Exposure of Sensitive Receptors to Health Hazards from Localized Particulate Matter in Excess of SMAQMD's Health-Based Concentration Thresholds

NEPA Effects: Alternative 7 is similar to Alternative 4 and involves the development of two less intakes (approximately 40% volumetric reduction) as compared to Alternative 1A. As such, the emissions generated by construction of Alternative 7 would be lower than Alternative 1A due to less construction activities. Localized health risk impacts resulting from emissions from Intakes 1 and 4 would be less or not occur due to absence in the development of these project features. Based on the emissions inventory conducted for the air quality analysis, development of Alternative 7 would result in 22% less PM10 and PM2.5 emissions as compared with Alternative 1A.

All annual PM10 and PM2.5 concentrations were found to be less than SMAQMD's annual thresholds for Alternative 1A. Because Alternative 7 would require less construction activity and generate fewer emissions than Alternative 1A, annual PM10 and PM2.5 concentrations from the development of Alternative 7 would also be less than the respective SMAQMD annual thresholds. However, as shown in Table 22-14, the maximum predicted 24-hour PM10 concentration for Alternative 1A would exceed SMAQMD's threshold of 2.5 $\mu g/m^3$. The modeled exceedances occur at 225 receptor locations near intakes and intake work areas. Because Alternative 7 would not involve the development of Intakes 1 and 4, emissions contributions from these intakes would not occur. It is anticipated that Alternative 7 would still result in 24-hour PM10 exceedances, but at fewer receptor locations than Alternative 1A. The exceedances would be temporary and occur intermittently due to soil disturbance. Accordingly, this alternative would expose a sensitive receptor to adverse levels of localized particulate matter concentrations. Mitigation Measure AQ-9 is available to address this effect.

***CEQA Conclusion*:** Respirable particulates pose a human health hazard by bypassing the defenses within the mucous ciliary system and entering deep lung tissue. Construction of Alternative 7 would result in the short-term exposure of receptors to PM10 concentrations that exceed SMAQMD threshold. This would be a significant impact. Mitigation Measure AQ-9 outlines a tiered strategy to reduce PM10 concentrations and public exposure to a less-than-significant level.

Mitigation Measure AQ-9: Implement Measures to Reduce Re-Entrained Road Dust and Receptor Exposure to PM2.5 and PM10

Please see Mitigation Measure AQ-9 under Impact AQ-9 in the discussion of Alternative 1A.

Impact AQ-10: Exposure of Sensitive Receptors to Health Hazards from Localized Particulate Matter in Excess of YSAQMD's Health-Based Concentration Thresholds

NEPA Effects: Table 22-15 under Alternative 1A shows that the maximum predicted PM2.5 and PM10 concentrations are less than YSAQMD's adopted thresholds. Because Alternative 7 would require less construction activity and generate fewer emissions than Alternative 1A, annual PM10 and PM2.5 concentrations from the development of Alternative 7 would also be less than the respective YSAQMD annual thresholds. The project would also implement all air district-recommended onsite fugitive dust controls, such as regular watering. Accordingly, this alternative would not expose sensitive receptors to adverse levels of localized particulate matter concentrations.

***CEQA Conclusion*:** Respirable particulates pose a human health hazard by bypassing the defenses within the mucous ciliary system and entering deep lung tissue. Construction of Alternative 1A would result in PM2.5 and PM10 concentrations at receptor locations that are below the significance thresholds established by the YSAQMD. Since Alternative 7 results in fewer overall emissions, localized particulate matter concentrations at analyzed receptors would not result in significant human health impacts. No mitigation is required.

Impact AQ-11: Exposure of Sensitive Receptors to Health Hazards from Localized Particulate Matter in Excess of BAAQMD's Health-Based Concentration Thresholds

NEPA Effects: Table 22-16 under Alternative 1A shows that the maximum predicted PM2.5 concentrations are less than BAAQMD's adopted thresholds. Because Alternative 7 would require less construction activity and generate fewer emissions than Alternative 1A, PM2.5 concentrations from the development of Alternative 7 would also be less than the respective BAAQMD annual thresholds. The project would also implement all air district-recommended onsite fugitive dust controls, such as regular watering. Accordingly, this alternative would not expose sensitive receptors to adverse levels of localized particulate matter concentrations.

***CEQA Conclusion*:** Respirable particulates pose a human health hazard by bypassing the defenses within the mucous ciliary system and entering deep lung tissue. Construction of Alternative 1A would result in PM2.5 concentrations at receptor locations that are below the significance thresholds established by the BAAQMD. Since Alternative 7 results in fewer overall emissions, localized particulate matter concentrations at analyzed receptors would not result in significant human health impacts. No mitigation is required.

Impact AQ-12: Exposure of Sensitive Receptors to Health Hazards from Localized Particulate Matter in Excess of SJVAPCD's Health-Based Concentration Thresholds

NEPA Effects: Table 22-17 under Alternative 1A shows that with exception of 24-hour PM10, maximum predicted PM2.5 and PM10 concentrations are less than SJVAPCD's adopted thresholds. The 24-hour PM10 concentrations attributable to the project would exceed the SJVAPCD's significance threshold at one receptor location. Emissions from the tunnel construction activities and concrete batch plant contribute to the exceedance at this location. Though Alternative 7 would result in less construction activities than Alternative 1A, it is anticipated that the receptor exposed to emissions from the concrete batch plant and tunnel activities would remain impacted. Accordingly, this alternative would expose a sensitive receptor to adverse levels of localized particulate matter concentrations. Mitigation Measure AQ-9 is available to address this effect.

***CEQA Conclusion*:** Respirable particulates pose a human health hazard by bypassing the defenses within the mucous ciliary system and entering deep lung tissue. Construction of Alternative 7 would result in the short-term exposure of receptors to PM10 concentrations that exceed SJVAPCD's threshold. This would be a significant impact. Mitigation Measure AQ-9 outlines a tiered strategy to reduce PM10 concentrations and public exposure to a less-than-significant level.

Mitigation Measure AQ-9: Implement Measures to Reduce Re-Entrained Road Dust and Receptor Exposure to PM2.5 and PM10

Please see Mitigation Measure AQ-9 under Impact AQ-9 in the discussion of Alternative 1A.

Impact AQ-13: Exposure of Sensitive Receptors to Health Hazards from Localized Carbon Monoxide

NEPA Effects: Continuous engine exhaust may elevate localized CO concentrations. Receptors exposed to these CO "hot-spots" may have a greater likelihood of developing adverse health effects (as described in Section 22.1.2). CO hot-spots are typically observed at heavily congested intersections where a substantial number of gasoline-powered vehicles idle for prolonged durations throughout the day. Construction sites are less likely to result in localized CO hot-spots due to the nature of construction activities (Sacramento Metropolitan Air Quality Management District 2014), which normally utilize diesel-powered equipment for intermittent or short durations. Moreover, construction sites must comply with the Occupational Safety and Health Administration's (OSHA) CO exposure standards for onsite workers. Unlike regional pollutants (e.g., ROG and NO_X), CO concentrations also dissipate as a function of distance and will therefore be lower at offsite receptor locations. Accordingly, given that construction activities typically do not result in CO hot-spots, onsite concentrations must comply with OSHA standards, and CO levels dissipate as a function of distance, equipment-generated CO emissions (see Table 22-131) are not anticipated to result in adverse health hazards to sensitive receptors.

Construction traffic may contribute to increased roadway congestion, which could lead to conditions conducive to CO hot-spot formation. As shown in Table 19-8, the highest peak hour traffic volumes under BPBGPP—12,567 vehicles per hour—would occur on westbound Interstate 80 between

Suisun Valley Road and State Route 12.[59] This is about half of the congested traffic volume modeled by BAAQMD (24,000 vehicles per hour) that would be needed to contribute to a localized CO hot-spot, and less than half of the traffic volume modeled by SMAQMD (31,600 vehicles per hour). The BAAQMD's and SMAQMD's CO screening criteria were developed based on County average vehicle fleets that are primarily comprised of gasoline vehicles. Construction vehicles would be predominantly diesel trucks, which generate fewer CO emissions per idle-hour and vehicle mile traveled than gasoline-powered vehicles. Accordingly, the air district screening thresholds provide a conservative evaluation threshold for the assessment of potential CO emissions impacts during construction.

Based on the above analysis, even if all 12,567 vehicles on the modeled traffic segment drove through the same intersection in the peak hour, CO concentrations adjacent to the traveled way would not exceed the CAAQS or NAAQS according to BAAQMD's and SMAQMD's screening criteria. Thus, construction traffic is not anticipated to result in adverse health hazards to sensitive receptors.

***CEQA Conclusion*:** Continuous engine exhaust may elevate localized CO concentrations. Receptors exposed to these CO "hot-spots" may have a greater likelihood of developing adverse health effects. Construction sites are less likely to result in localized CO hot-spots due to the nature of construction activities (Sacramento Metropolitan Air Quality Management District 2014), which normally utilize diesel-powered equipment for intermittent or short durations. Moreover, construction sites must comply with the OSHA CO exposure standards for onsite workers. Accordingly, given that construction activities typically do not result in CO hot-spots, onsite concentrations must comply with OSHA standards, and CO levels dissipate as a function of distance, equipment-generated CO emissions are not anticipated to result in significant health hazards to sensitive receptors. Similarly, peak-hour construction traffic on local roadways would not exceed BAAQMD's or SMAQMD's conservative screening criteria for the formation potential CO hot-spots. This impact would be less than significant. No mitigation is required.

Impact AQ-14: Exposure of Sensitive Receptors to Health Hazards from Diesel Particulate Matter in Excess of SMAQMD's Chronic Non-Cancer and Cancer Risk Thresholds

NEPA Effects: As shown in Table 22-19, Alternative 1A would not exceed the SMAQMD's thresholds for chronic non-cancer hazard or cancer risk. Because Alternative 7 would require less construction activity and generate fewer emissions than Alternative 1A, chronic non-cancer hazard and cancer risk from the development of Alternative 7 would also be less than the respective SMAQMD significance thresholds. Accordingly, this alternative would not expose sensitive receptors to adverse levels of DPM such as would result in chronic non-cancer hazards or cancer risk.

***CEQA Conclusion*:** DPM generated during construction poses inhalation-related chronic non-cancer hazard and cancer risk if adjacent receptors are exposed to significant concentrations for prolonged durations. DPM generated during Alternative 7 construction would not exceed the SMAQMD's chronic non-cancer hazard or cancer risk threshold. Therefore, this impact for DPM emissions would be less than significant. No mitigation is required.

---

[59] The above volumes are based on the traffic analysis conducted for Alternative 1A. Since few vehicles would be required under Alternative 7, traffic impacts would likely be less than those estimated for Alternative 1A.

Impact AQ-15: Exposure of Sensitive Receptors to Health Hazards from Diesel Particulate Matter in Excess of YSAQMD's Chronic Non-Cancer and Cancer Risk Thresholds

NEPA Effects: As shown in Table 22-19, Alternative 1A would not exceed the YSAQMD's thresholds for chronic non-cancer hazard or cancer risk. Because Alternative 7 would require less construction activity and generate fewer emissions than Alternative 1A, chronic non-cancer hazard and cancer risk from the development of Alternative 7 would also be less than the respective YSAQMD significance thresholds. Accordingly, this alternative would not expose sensitive receptors to adverse levels of DPM such as would result in chronic non-cancer hazards or cancer risk.

***CEQA Conclusion*:** DPM generated during construction poses inhalation-related chronic non-cancer hazard and cancer risk if adjacent receptors are exposed to significant concentrations for prolonged durations. The DPM generated during Alternative 7 construction would not exceed the YSAQMD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial health hazards. Therefore, this impact for DPM emissions would be less than significant. No mitigation is required.

Impact AQ-16: Exposure of Sensitive Receptors to Health Hazards from Diesel Particulate Matter in Excess of BAAQMD's Chronic Non-Cancer and Cancer Risk Thresholds

NEPA Effects: As shown in Table 22-20, Alternative 1A would not exceed the BAAQMD's thresholds for chronic non-cancer hazard; however, it would exceed BAAQMD's cancer risk threshold. The primary emission sources for these exceedances are from a project haul route, control structure work area and potential spoil area. While the impact of Alternative 7 would be less than Alternative 1A, Alternative 7 may still expose sensitive receptors to adverse levels of carcinogenic DPM concentrations.

Mitigation Measure AQ-16 would be available to reduce exposure to substantial cancer risk by relocating affected receptors. Although Mitigation Measure AQ-16 would reduce the severity of this effect, the BDCP proponents are not solely responsible for implementation of the measure. If a landowner chooses not to accept DWR's offer of relocation assistance, an adverse effect in the form excess cancer risk above air district thresholds would occur. Therefore, this effect would be adverse. If, however, all landowners accept DWR's offer of relocation assistance, effects would not be adverse.

***CEQA Conclusion*:** DPM generated during construction poses inhalation-related chronic non-cancer hazard and cancer risk if adjacent receptors are exposed to significant concentrations for prolonged durations. The DPM generated during Alternative 7 construction would not exceed the BAAQMD's chronic non-cancer hazard threshold; however, it would exceed the BAAQMD's cancer thresholds. Therefore, this impact for DPM emissions would be significant.

Mitigation Measure AQ-16 would be available to reduce exposure to substantial cancer risk by relocating affected receptors. Although Mitigation Measure AQ-16 would reduce the severity of this effect, the BDCP proponents are not solely responsible for implementation of the measure. If a landowner chooses not to accept DWR's offer of relocation assistance, a significant impact in the form excess cancer risk above air district thresholds would occur. Therefore, this effect would be significant and unavoidable. If, however, all landowners accept DWR's offer of relocation assistance, the impact would be less than significant.

Mitigation Measure AQ-16: Relocate Sensitive Receptors to Avoid Excess Cancer Risk

Please see Mitigation Measure AQ-16 under Impact AQ-16 in the discussion of Alternative 1A.

Impact AQ-17: Exposure of Sensitive Receptors to Health Hazards from Diesel Particulate Matter in Excess of SJVAPCD's Chronic Non-Cancer and Cancer Risk Thresholds

NEPA Effects: Table 22-21 under Alternative 1A shows that the maximum predicted chronic non-cancer hazard and cancer risk associated with the project are less than SJVAPCD's adopted thresholds. Because Alternative 7 would require less construction activity and generate fewer emissions than Alternative 1A, chronic non-cancer hazard and cancer risk from the development of Alternative 7 would also be less than the respective SJVAPCD significance thresholds. Accordingly, this alternative would not expose sensitive receptors to adverse levels of DPM such as would result in chronic non-cancer hazards or cancer risk.

***CEQA Conclusion*:** DPM generated during construction poses inhalation-related chronic non-cancer hazard and cancer risk if adjacent receptors are exposed to significant concentrations for prolonged durations. The DPM generated during Alternative 7 construction would not exceed the SJVAPCD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this impact for DPM emissions would be less than significant. No mitigation is required.

Impact AQ-18: Exposure of Sensitive Receptors to *Coccidioides immitis* (Valley Fever)

***NEPA Effects*:** As discussed under Alternative 1A, earthmoving activities during construction could release *C. immitis* spores if filaments are present and other soil chemistry and climatic conditions are conducive to spore development. Receptors adjacent to the construction area may therefore be exposed to increase risk of inhaling *C. immitis* spores and subsequent development of Valley Fever. Dust-control measures are the primary defense against infection (United States Geological Survey 2000). Implementation of advanced air-district recommended fugitive dust controls outlined in Appendix 3B, *Environmental Commitments*, would avoid dusty conditions and reduce the risk of contracting Valley Fever through routine watering and other controls. Therefore, this alternative's effect of exposure of sensitive receptors to increased Valley Fever risk during construction would not be adverse.

***CEQA Conclusion*:** Construction of the water conveyance facility would involve earthmoving activities that could release *C. immitis* spores if filaments are present and other soil chemistry and climatic conditions are conducive to spore development. Receptors adjacent to the construction area may therefore be exposed to increase risk of inhaling *C. immitis* spores and subsequent development of Valley Fever. Implementation of air-district recommended fugitive dust controls outlined in Appendix 3B, *Environmental Commitments*, would avoid dusty conditions and reduce the risk of contracting Valley Fever through routine watering and other controls. Therefore, this impact would be less than significant. No mitigation is required.

Impact AQ-19: Creation of Potential Odors Affecting a Substantial Number of People during Construction or Operation of the Proposed Water Conveyance Facility

NEPA Effects: As discussed under Alternative 1A, odors from construction activities would be localized and generally confined to the immediate area surrounding the construction site. Moreover, odors would be temporary and localized, and they would cease once construction activities have

been completed. Thus, it is not anticipated that construction of CM1 would create objectionable odors from construction equipment or asphalt paving.

Construction of the water conveyance facility would require removal of subsurface material during tunnel excavation and sediment removal. As discussed under Alternative 1A, geotechnical tests indicate that VOC levels in Plan Area soils are below the method detection limits, indicating that organic decay of exposed RTM and sediment will be relatively low (URS 2014). Moreover, drying and stockpiling of the removed RTM and sediment will occur under aerobic conditions, which will further limit any potential decomposition and associated malodorous products. Accordingly, it is not anticipated that tunnel and sediment excavation would create objectionable odors.

Typical facilities known to produce odors include landfills, wastewater treatment plants, food processing facilities, and certain agricultural activities. Alternative 7 would not result in the addition of facilities associated with odors, and as such, long-term operation of the water conveyance facility would not result in objectionable odors.

***CEQA Conclusion*:** Alternative 7 would not result in the addition of major odor producing facilities. Diesel emissions during construction could generate temporary odors, but these would quickly dissipate and cease once construction is completed. Likewise, potential odors generated during asphalt paving would be addressed through mandatory compliance with air district rules and regulations. While tunnel excavation would unearth substantial quantities of RTM, geotechnical tests indicate that soils in the Plan Area have relatively low organic constituents. Moreover, drying and stockpiling of the removed RTM will occur under aerobic conditions, which will further limit any potential decomposition and associated malodorous products. Accordingly, the impact of exposure of sensitive receptors to potential odors during construction would be less than significant. No mitigation is required.

Impact AQ-20: Generation of Criteria Pollutants in the Excess of Federal *De Minimis* Thresholds from Construction and Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: EPA's General Conformity Rule (40 CFR Parts 51 and 93) only applies to Federal actions that are taken in EPA-designated "nonattainment" or "maintenance" areas. Accordingly, as outlined in Section III.A of the General Conformity Rule, "only actions which cause emissions in designated nonattainment and maintenance areas are subject to the regulations". Criteria pollutant emissions resulting from construction and operation of Alternative 7 in the SFNA, SJVAB, and SFBAAB are presented in Table 22-133. Exceedances of the federal *de minimis* thresholds are shown in underlined text.

Sacramento Federal Nonattainment Area

As shown in Table 22-133, implementation of Alternative 7 would exceed the following SFNA federal *de minimis* thresholds:

- ROG: 2024–2025
- NO_X: 2018–2028

ROG and NO_X are precursors to ozone and NO_X is a precursor to PM, for which the SFNA is in nonattainment for the NAAQS. Since project emissions exceed the federal *de minimis* thresholds for ROG and NO_X, a general conformity determination must be made to demonstrate that total direct and indirect emissions of NO_X would conform to the appropriate SFNA SIP for each year of construction in which the *de minimis* thresholds are exceeded.

NO_X is also a precursor to PM and can contribute to PM formation. As discussed above, Sacramento County is currently designated maintenance for the PM10 NAAQS and portions of the SVAB are designated nonattainment for the PM2.5 NAAQS. NO_X emissions in excess of 100 tons per year in Sacramento County trigger a secondary PM10 precursor threshold, whereas NO_X emissions in excess of 100 tons per year in the SVAB trigger a secondary PM2.5 precursor threshold. Since NO_X emissions can contribute to PM formation, NO_X emissions in excess of these secondary precursor thresholds could conflict with the applicable PM10 and PM2.5 SIPs. Accordingly, NO_X offsets pursued for the purposes of general conformity for those years in which NO_X emissions exceed 100 tons must occur within the federally designated PM2.5 nonattainment and PM10 maintenance areas of the SVAB.

As shown in Table 22-131, NO_X emissions generated by construction activities in SMAQMD (Sacramento County) would exceed 100 tons per year between 2022 and 2027. The project therefore triggers the secondary PM10 precursor threshold, requiring all NO_X offsets for 2022 through 2027 to occur within Sacramento County.

Given the magnitude of NO_X emissions and the limited geographic scope available for offsets in 2022 through 2027 (Sacramento County), neither Mitigation Measures AQ-1a nor 1b could feasibly reduce NO_X emissions to net zero for the purposes of general conformity.[60] This impact would be adverse. In the event that Alternative 7 is selected as the APA, Reclamation, USFWS, and NMFS would need to demonstrate that conformity is met for NO_X and secondary PM10 formation through a local air quality modeling analysis (i.e., dispersion modeling) or other acceptable methods to ensure project emissions do not cause or contribute to any new violations of the NAAQS or increase the frequency or severity of any existing violations.

Mitigation Measure AQ-1a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-1a under Impact AQ-1 in the discussion of Alternative 1A.

Mitigation Measure AQ-1b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-1b under Impact AQ-1 in the discussion of Alternative 1A.

---

[60] The secondary PM precursor thresholds are triggered through the General Conformity Regulation (40 CFR 93.153 (a)(1)). Accordingly, confinement of the geographic scope for available offsets only applies to the General Conformity determination and does not influence mitigation feasibility for Impacts AQ-1 or AQ-28.

Table 22-133. Criteria Pollutant Emissions from Construction and Operation of Alternative 7 in Nonattainment and Maintenance Areas of the SFNA, SJVAB, and SFBAAB (tons/year)

Year	Sacramento Federal Nonattainment Area					
	ROG	NO_X[a]	CO[b]	PM10[c]	PM2.5	SO_2
2016	0	0	0	0	0	0
2017	0	0	0	0	0	0
2018	3	28	<1	11	2	<1
2019	4	25	<1	23	4	<1
2020	8	64	1	33	5	<1
2021	10	90	3	45	7	<1
2022	13	115	5	54	9	<1
2023	25	200	5	76	13	1
2024	32	248	5	90	17	1
2025	27	194	3	62	12	1
2026	25	173	2	56	11	1
2027	21	158	3	62	12	1
2028	6	42	3	28	5	<1
2029	<1	3	<1	3	<1	<1
ELT	0.14	0.82	1.69	0.28	0.08	<0.01
LLT	0.12	0.69	1.61	0.27	0.07	<0.01
De Minimis	*25*	*25*	*100*	*100*	*100*	*100*
	San Joaquin Valley Air Basin					
Year	ROG	NO_X[a]	CO[b]	PM10	PM2.5	SO_2
2016	0	0	0	2	<1	0
2017	0	0	0	0	0	0
2018	1	6	0	11	1	<1
2019	10	71	0	17	3	<1
2020	17	122	0	32	5	<1
2021	26	190	0	51	8	1
2022	25	162	0	31	6	1
2023	22	132	0	17	3	<1
2024	21	121	0	16	3	<1
2025	13	80	0	13	2	<1
2026	5	32	0	3	1	<1
2027	<1	<1	0	1	1	<1
2028	0	0	0	0	0	0
2029	0	0	0	0	0	0
ELT	0.01	0.07	0.13	0.02	<0.01	<0.01
LLT	0.01	0.06	0.12	0.01	<0.01	<0.01
De Minimis	*10*	*10*	*100*	*100*	*100*	*100*

Year	San Francisco Bay Area Air Basin					
	ROG	NO_X	CO[b]	PM10[d]	PM2.5	SO_2
2016	0	0	0	-	0	0
2017	0	0	0	-	0	0
2018	<1	2	<1	-	<1	<1
2019	2	16	1	-	1	<1
2020	3	25	1	-	1	<1
2021	4	33	2	-	2	<1
2022	5	37	3	-	2	<1
2023	8	59	4	-	5	<1
2024	12	84	5	-	6	1
2025	7	51	3	-	4	<1
2026	5	40	3	-	4	<1
2027	3	21	2	-	3	<1
2028	<1	2	1	-	1	<1
2029	<1	<1	<1	-	<1	<1
ELT	0.01	0.08	0.14	-	0.01	<0.01
LLT	0.01	0.07	0.14	-	0.01	<0.01
De Minimis	*100*	*100*	*100*	-	*100*	*100*

[a] NO_X emissions in excess of 100 tons per year within federally designated PM10 and PM2.5 nonattainment or maintenance areas trigger a secondary PM10 and PM2.5 precursor threshold. NO_X emissions in excess of this secondary threshold could conflict with the applicable PM10 and PM2.5 SIPs. Accordingly, NO_X offsets pursued for the purposes of general conformity for those years in which NO_X emissions exceed 100 tons must occur within the federally designated PM2.5 nonattainment and PM10 maintenance areas, as applicable.

[b] The proposed water conveyance facility is located within a federally designated CO attainment area. Accordingly, CO emissions generated by construction of CM1 are not subject to the General Conformity Rule and are excluded from the emissions summary and general conformity analysis (40 CFR Part 51 and 93, Section III.A). Emissions presented in the table are limited those generated by haul trucks, which would occur in federally designated CO maintenance area.

[c] There are no federally designated PM10 maintenance areas in Yolo County. Accordingly, PM10 emissions generated by construction of CM1 in Yolo County are not subject to the General Conformity Rule and are excluded from the emissions summary and general conformity analysis for the SFNA (40 CFR Part 51 and 93, Section III.A). Emissions presented in the table are limited those generated within Sacramento County.

[d] There are no federally designated PM10 nonattainment or maintenance areas in the SFBAAB. Accordingly, PM10 emissions generated by construction of CM1 are not subject to the General Conformity Rule and are excluded from the emissions summary and general conformity analysis (40 CFR Part 51 and 93, Section III.A).

San Joaquin Valley Air Basin

As shown in Table 22-133, implementation of Alternative 7 would exceed the following SJVAB federal *de minimis* thresholds:

- ROG: 2020–2025
- NO_X: 2019–2026

ROG and NO_X are precursors to ozone and NO_X is a precursor to PM, for which the SJVAB is in nonattainment for the NAAQS. Since project emissions exceed the federal *de minimis* threshold for ROG and NO_X, a general conformity determination must be made to demonstrate that total direct and indirect emissions of ROG and NO_X would conform to the appropriate SJVAB SIP for each year of construction in which the *de minimis* thresholds are exceeded.

NO_X is also a precursor to PM and can contribute to PM formation. As discussed above, the SJVAB is currently designated maintenance for the PM10 NAAQS and nonattainment for the PM2.5 NAAQS. NO_X emissions in excess of 100 tons per year trigger a secondary PM precursor threshold, and could conflict with the applicable PM10 and PM2.5 SIPs. As shown in Table 22-133, NO_X emissions generated by construction activities in the SJVAB would exceed 100 tons per year between 2020 and 2024. NO_X offsets pursued for the purposes of general conformity for those years in which NO_X emissions exceed 100 tons must occur within the federally designated PM2.5 nonattainment and PM10 maintenance areas of the SJVAB, which are consistent with the larger nonattainment boundary for ozone.

As shown in Appendix 22E, *General Conformity Determination,* Attachment 22E-1, SJVAPCD confirms that sufficient emissions reduction credits would be available to fully offset ROG and NO_X emissions in excess of the federal *de minimis* thresholds zero through implementation of Mitigation Measures AQ-4a and 4b. Mitigation Measures AQ-4a and 4b will ensure the requirements of the mitigation and offset program are implemented and conformity requirements for ROG and NO_X are met, should Alternative 7 be selected as the APA.

Mitigation Measure AQ-4a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4a under Impact AQ-4 in the discussion of Alternative 1A.

Mitigation Measure AQ-4b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4b under Impact AQ-4 in the discussion of Alternative 1A.

San Francisco Bay Area Air Basin

As shown in Table 22-133, implementation of Alternative 7 would not exceed any of the SFBAAB federal *de minimis* thresholds. Accordingly, a general conformity determination is not required as total direct and indirect emissions would conform to the appropriate SFBAAB SIPs.

CEQA Conclusion: SFNA and SJVAB are classified as nonattainment areas with regard to the ozone NAAQS and the impact of increases in criteria pollutant emissions above the air basin *de minimis* thresholds could conflict with or obstruct implementation of the applicable air quality plans. Since construction emissions in the SFNA and SJVAB would exceed the *de minimis* thresholds for ROG and NO_X, this impact would be significant.

Mitigation Measures AQ-4a and AQ-4b would ensure project emissions would not result in an increase in regional ROG or NO_X in the SJVAB. These measures would therefore ensure total direct and indirect ROG and NO_X emissions generated by the project would conform to the appropriate SJVAB SIPs by offsetting the action's emissions in the same or nearby area to net zero. Accordingly, impacts would be less than significant with mitigation in the SJVAB.

Although Mitigation Measures AQ-1a and AQ-1b would reduce NO_X in the SFNA, given the magnitude of NO_X emissions and the limited geographic scope available for offsets (Sacramento County), neither measure could feasibly reduce NO_X emissions to net zero for the purposes of general conformity. This impact would be significant and unavoidable in the SFNA.

Emissions generated within the SFBAAB would not exceed the SFBAAB de minimis thresholds and would therefore conform to the appropriate SFBAAB SIPs. No mitigation is required.

Impact AQ-21: Generation of Cumulative Greenhouse Gas Emissions during Construction of the Proposed Water Conveyance Facility

NEPA Effects: GHG (CO_2, CH_4, N_2O, SF_6, and HFCs) emissions resulting from construction of Alternative 7 are presented in Table 22-128. Emissions with are presented with implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*) and state mandates to reduce GHG emissions. State mandates include the RPS, LCFS, and Pavley. These mandates do not require additional action on the part of DWR, but will contribute to GHG emissions reductions. For example, Pavley and LCFS will improve the fuel efficiency of vehicles and reduce the carbon content of transportation fuels, respectively. Equipment used to construct the project will therefore be cleaner and less GHG intensive than if the state mandates had not been established. Due to the global nature of GHGs, the determination of effects is based on total emissions generated by construction (Table 22-134).

Table 22-134. GHG Emissions from Construction of Alternative 7 (metric tons/year)[a]

Year	Equipment and Vehicles (CO_2e)	Electricity (CO_2e)	Concrete Batching (CO_2)	Total CO_2e
2016	0	0	428	428
2017	0	0	0	0
2018	12,007	616	53,121	65,745
2019	41,416	3,445	8,344	53,205
2020	71,346	16,547	51,847	139,740
2021	106,134	44,055	102,833	253,022
2022	118,049	61,863	155,860	335,772
2023	143,645	55,070	152,171	350,886
2024	161,511	57,442	182,059	401,013
2025	111,863	38,750	121,570	272,183
2026	85,473	13,834	29,133	128,440
2027	61,317	2,642	42,014	105,973
2028	21,518	70	8,266	29,853
2029	1,300	2	0	1,302
Total	*935,579*	*294,338*	*907,645*	*2,137,562*

[a] Emissions estimates do not account for GHG flux from land disturbance. Surface and subsurface (e.g., tunneling) activities may oxidize peat soils, releasing GHG emissions. However, recent geotechnical surveys indicated that peat is negligible below 80 feet of depth. The tunnel will be placed below this range and the design adjusted if peat soils are discovered. Peat material encountered during surface excavation for non-tunnel work will be covered with top soil to reduce oxidation when needed.

Values may not total correctly due to rounding.

Table 22-135 summarizes GHG emissions that would be generated in the BAAQMD, SMAQMD, SJVAPCD, and YSAQMD. The table does not include emissions from electricity generation as these emissions would be generated by power plants located throughout the state (see discussion preceding this impact analysis). GHG emissions presented in Table 22-135 are therefore provided for information purposes only.

Table 22-135. GHG Emissions from Construction of Alternative 7 by Air District (metric tons/year)[a]

Year	Equipment and Vehicles (CO_2e)	Concrete Batching (CO_2)[a]	Total CO_2e[b]
SMAQMD	399,753	544,587	944,340
YSAQMD	39,089	0	39,089
SJVAPCD	312,492	181,529	494,021
BAAQMD	184,244	181,529	365,773

[a] Emissions assigned to each air district based on the number of batching plants located in that air district.

[b] Values may not total correctly due to rounding.

Construction of Alternative 7 would generate a total of 2.1 million metric tons of GHG emissions after implementation of environmental commitments and state mandates. This is equivalent to adding 450,000 typical passenger vehicles to the road during construction (U.S. Environmental Protection Agency 2014e). As discussed in section 22.3.2, *Determination of Effects*, any increase in emissions above net zero associated with construction of the BDCP water conveyance features would be adverse. Accordingly, this effect would be adverse. Mitigation Measure AQ-21, which would develop a GHG Mitigation Program to reduce construction-related GHG emissions to net zero, is available address this effect.

CEQA Conclusion: Construction of Alternative 7 would generate a total of 2.1 million metric tons of GHG emissions. This is equivalent to adding 450,000 typical passenger vehicles to the road during construction (U.S. Environmental Protection Agency 2014e). As discussed in section 22.3.2, *Determination of Effects*, any increase in emissions above net zero associated with construction of the BDCP water conveyance features would be significant. Mitigation Measure AQ-21 would develop a GHG Mitigation Program to reduce construction-related GHG emissions to net zero. Accordingly, this impact would be less-than-significant with implementation of Mitigation Measure AQ-21.

Mitigation Measure AQ-21: Develop and Implement a GHG Mitigation Program to Reduce Construction Related GHG Emissions to Net Zero (0)

Please see Mitigation Measure AQ-21 under Impact AQ-21 in the discussion of Alternative 1A.

Impact AQ-22: Generation of Cumulative Greenhouse Gas Emissions from Operation and Maintenance of the Proposed Water Conveyance Facility and Increased Pumping

NEPA Effects: Operation of Alternative 7 would generate direct and indirect GHG emissions. Sources of direct emissions include heavy-duty equipment, on road crew trucks, and employee vehicle traffic. Indirect emissions would be generated predominantly by electricity consumption required for pumping as well as, maintenance, lighting, and other activities.

Table 22-136 summarizes long-term operational GHG emissions associated with operations, maintenance, and increased SWP pumping. Emissions were quantified for both ELT and LLT conditions, although activities would take place annually until project decommissioning. Emissions include state mandates to reduce GHG emissions (described in Impact AQ-21) are presented (there are no BDCP specific operational environmental commitments). Total CO_2e emissions are compared to both the No Action Alternative (NEPA point of comparison) and Existing Conditions (CEQA baseline). As discussed in Section 22.3.1.2, equipment emissions are assumed to be zero under both the No Action Alternative (NEPA point of comparison) and Existing Conditions (CEQA baseline). The equipment emissions presented in Table 22-136 are therefore representative of project impacts for both the NEPA and CEQA analysis.

Table 22-136. GHG Emissions from Operation, Maintenance, and Increased SWP Pumping, Alternative 7 (metric tons/year)

		Electricity CO_{2e}		Total CO_2e	
Condition	Equipment CO_2e	NEPA Point of Comparison	CEQA Baseline	NEPA Point of Comparison	CEQA Baseline
ELT	386	-	-110,762	-	-110,376
LLT	379	-21,013	-48,217	-20,634	-47,838

Note: The *NEPA point of comparison* compares total CO_2e emissions after implementation of Alternative 7 to the No Action Alternative, whereas the *CEQA baseline* compares total CO_2e emissions to Existing Conditions. Negative values represent a net GHG reduction.

Table 22-137 summarizes total CO_2e emissions that would be generated in the BAAQMD, SMAQMD, and SJVAPCD (no operational emissions would be generated in the YSAQMD). The table does not include emissions from SWP pumping as these emissions would be generated by power plants located throughout the state (see discussion preceding this impact analysis). GHG emissions presented in Table 22-137 are therefore provided for information purposes only.

Table 22-137. Equipment CO_2e Emissions from Operation and Maintenance of Alternative 7 by Air District (metric tons/year)

Air District	ELT	LLT
SMAQMD	331	323
SJVAPCD	25	26
BAAQMD	30	31
Total	286	379

[a] Emissions do not include emissions generated by increased SWP pumping.

SWP Operational and Maintenance GHG Emissions Analysis

Alternative 7 would not add any additional net electricity demand to operation of the SWP and would in fact result in a net reduction in electricity demand (see Table 22-136). Therefore, there will be no impact on SWP operational emissions.

A small amount of additional GHG emissions from equipment would be emitted as a result of the maintenance of new facilities associated with Alternative 7 (Table 22-136). Emissions from additional maintenance activities would become part of the overall DWR maintenance program for the SWP and would be managed under DWR's CAP.

The CAP sets forth DWR's plan to manage its activities and operations to achieve its GHG emissions reduction goals. The CAP commits DWR to monitoring its emissions each year and evaluating its emissions every five years to determine whether it is on a trajectory to achieve its GHG emissions reduction goals. If it appears that DWR will not meet the GHG emission reduction goals established in the plan, DWR may make adjustments to existing emissions reduction measures, devise new measures to ensure achievement of the goals, or take other action.

Consistent with the analysis contained in the CAP and associated Initial Study and Negative Declaration for the CAP, BDCP Alternative 7 would not adversely affect DWR's ability to achieve the GHG emissions reduction goals set forth in the CAP. Further, Alternative 7 would not conflict with any of DWR's specific action GHG emissions reduction measures and implements all applicable project level GHG emissions reduction measures as set forth in the CAP. BDCP Alternative 7 is therefore consistent with the analysis performed in the CAP. There would be no adverse effect.

CEQA Conclusion: SWP GHG emissions currently are below 1990 levels and achievement of the goals of the CAP means that total DWR GHG emissions will be reduced to 50% of 1990 levels by 2020 and to 80% of 1990 levels by 2050. The implementation of BDCP Alternative 7 would not affect DWR's established emissions reduction goals or baseline (1990) emissions and therefore would not result in a change in total DWR emissions that would be considered significant. Prior adoption of the CAP by DWR already provides a commitment on the part of DWR to make all necessary modifications to DWR's REPP (as described above) or any other GHG emission reduction measure in the CAP that are necessary to achieve DWR's GHG emissions reduction goals. Therefore no amendment to the approved CAP is necessary to ensure the occurrence of the additional GHG emissions reduction activities needed to account for BDCP-related operational or maintenance emissions. The effect of BDCP Alternative 7 with respect to GHG emissions is less than cumulatively considerable and therefore less than significant. No mitigation is required.

Impact AQ-23: Generation of Cumulative Greenhouse Gas Emissions from Increased CVP Pumping as a Result of Implementation of CM1

NEPA Effects: As previously discussed, DWR's CAP cannot be used to evaluate environmental impacts associated with increased CVP pumping, as emissions associated with CVP are not under DWR's control and are not included in the CAP. Accordingly, GHG emissions resulting from increased CVP energy use are evaluated separately from GHG emissions generated as a result of SWP energy use.

Under Alternative 7, operation of the CVP yields the generation of clean, GHG emissions-free, hydroelectric energy. This electricity is sold into the California electricity market or directly to energy users. Analysis of the existing and future no action condition indicates that the CVP generates and will continue to generate all of the electricity needed to operate the CVP system and approximately 3,500 GWh of excess hydroelectric energy that would be sold to energy users throughout California.

Implementation of Alternative 7 is neither expected to require additional electricity over the No Action Alternative nor reduce the amount of excess CVP generation available for sale from the CVP to electricity users. The CVP is operated using energy generated at CVP hydroelectric facilities and therefore results in no GHG emissions. Rather, implementation of Alternative 7 would reduce GHG emissions by 24,589 to 31,644 metric tons of CO_2e, relative to the No Action Alternative (depending on whether the RPS is assumed in the emissions calculations). Accordingly, there would be no adverse effect.

***CEQA Conclusion*:** Implementation of Alternative 7 is neither expected to require additional electricity over Existing Conditions nor reduce the amount of excess CVP generation available for sale from the CVP to electricity users. All power supplied to CVP facilities would continue to be supplied by GHG emissions-free hydroelectricity and there would be no increase in GHG emissions over Existing Conditions as a result of CVP operations. The impact would be less than significant and no mitigation is required.

Impact AQ-24: Generation of Regional Criteria Pollutants from Implementation of CM2–CM11

NEPA Effects: Table 22-29 summarizes potential construction and operational emissions that may be generated by implementation of CM2–CM11. See the discussion of Impact AQ-24 under Alternative 1A.

Criteria pollutants from restoration and enhancement actions could exceed applicable general conformity *de minimis* levels and applicable local thresholds. The effect would vary according to the equipment used in construction of a specific conservation measure, the location, the timing of the actions called for in the conservation measure, and the air quality conditions at the time of implementation; these effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. The effect of increases in emissions during implementation of CM2–CM11 in excess of applicable general conformity *de minimis* levels and air district regional thresholds (Table 22-8) could violate air basin

SIPs and worsen existing air quality conditions. Mitigation Measure AQ-24 would be available to reduce this effect, but emissions would still be adverse.

CEQA Conclusion**:** Construction and operational emissions associated with the restoration and enhancement actions would result in a significant impact if the incremental difference, or increase, relative to Existing Conditions exceeds the applicable local air district thresholds shown in Table 22-8; these effects are expected to be further evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measure AQ-24 would be available to reduce this effect, but may not be sufficient to reduce emissions below applicable air quality management district thresholds (see Table 22-8). Consequently, this impact would be significant and unavoidable.

Mitigation Measure AQ-24: Develop an Air Quality Mitigation Plan (AQMP) to Ensure Air District Regulations and Recommended Mitigation are Incorporated into Future Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-24 under Impact AQ-24 in the discussion of Alternative 1A.

Impact AQ-25: Exposure of Sensitive Receptors to Health Hazards from Localized Particulate Matter, Carbon Monoxide, and Diesel Particulate Matter from Implementation of CM2–CM11

NEPA Effects: The potential for Alternative 7 to expose sensitive receptors increased health hazards from localized PM, CO, and DPM would be similar to Alternative 1A. Activities shown in Table 22-29 with the greatest potential to have short or long-term air quality impacts are also anticipated to have the greatest potential to expose receptors to substantial pollutant concentrations. The effect would vary according to the equipment used, the location and timing of the actions called for in the conservation measure, the meteorological and air quality conditions at the time of implementation, and the location of receptors relative to the emission source. Potential health effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions.

The effect of increases in PM, CO, or DPM (cancer and non-cancer-risk) in excess of applicable air district thresholds (Table 22-8) at receptor locations could result in adverse health impacts. Mitigation Measures AQ-24 and AQ-25 would be available to reduce this effect.

CEQA Conclusion**:** Construction and operational emissions associated with the restoration and enhancement actions under Alternative 7 would result in a significant impact if PM, CO, or DPM (cancer and non-cancer-risk) concentrations at receptor locations exceed the applicable local air district thresholds shown in Table 22-8; these effects are expected to be further evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measures AQ-24 and AQ-25 would ensure localized concentrations at receptor locations would be below applicable air quality management district thresholds (see Table 22-8). Consequently, this impact would be less than significant.

Mitigation Measure AQ-24: Develop an Air Quality Mitigation Plan (AQMP) to Ensure Air District Regulations and Recommended Mitigation are Incorporated into Future Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-24 under Impact AQ-24 in the discussion of Alternative 1A.

Mitigation Measure AQ-25: Prepare a Project-Level Health Risk Assessment to Reduce Potential Health Risks from Exposure to Localized DPM and PM Concentrations

Please see Mitigation Measure AQ-25 under Impact AQ-25 in the discussion of Alternative 1A.

Impact AQ-26: Creation of Potential Odors Affecting a Substantial Number of People from Implementation of CM2–CM11

NEPA Effects: The potential for Alternative 7 to expose sensitive receptors increased odors would be similar to Alternative 1A. Accordingly, construction activities associated with CM2-CM11 are not anticipated to result in nuisance odors. Similarly, while restored land uses associated with the program have the potential to generate odors from natural processes, the emissions would be similar in origin and magnitude to the existing land use types in the restored area (e.g., managed wetlands). Moreover, specific odor effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Accordingly, odor-related effects associated with CM2–CM11 would not be adverse.

***CEQA Conclusion*:** Alternative 7 would not result in the addition of major odor producing facilities. Diesel emissions during construction could generate temporary odors, but these would quickly dissipate and cease once construction is completed. Increases in wetland, tidal, and upland habitats may increase the potential for odors from natural processes. However, the origin and magnitude of odors would be similar to the existing land use types in the restored area (e.g., managed wetlands). Moreover, specific odor impacts would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Accordingly, the impact of exposure of sensitive receptors to potential odors would be less than significant. No mitigation is required.

Impact AQ-27: Generation of Cumulative Greenhouse Gas Emissions from Implementation of CM2–CM11

NEPA Effects: CM2–CM11 implemented under Alternative 7 would result in local GHG emissions from construction equipment and vehicle exhaust, similar to Alternative 1A. Restoration activities with the greatest potential for emissions include those that break ground and require use of earthmoving equipment. The type of restoration action and related construction equipment use are shown in Table 22-29. Implementing CM2–CM11 would also affect long-term sequestration rates through land use changes, such as conversion of agricultural land to wetlands, inundation of peat soils, drainage of peat soils, and removal or planting of carbon-sequestering plants.

Without additional information on site-specific characteristics associated with each of the restoration components, a complete assessment of GHG flux from CM2–CM11 is currently not possible. The effect of carbon sequestration and CH_4 generation would vary by land use type, season, and chemical and biological characteristics; these effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measures AQ-24 and AQ-27 would be available to reduce this effect. However, due to the potential for increases in GHG emissions from construction and land use change, this effect would be adverse.

***CEQA Conclusion*:** The restoration and enhancement actions under Alternative 7 could result in a significant impact if activities are inconsistent with applicable GHG reduction plans, do not contribute to a lower carbon future, or generate excessive emissions, relative to other projects throughout the state. These effects are expected to be further evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measures AQ-24 and AQ-27 would be available to reduce this impact, but may not be sufficient to reduce to a less-than-significant level. Consequently, this impact would be significant and unavoidable.

Mitigation Measure AQ-24: Develop an Air Quality Mitigation Plan (AQMP) to Ensure Air District Regulations and Recommended Mitigation are Incorporated into Future Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-24 under Impact AQ-24 in the discussion of Alternative 1A.

Mitigation Measure AQ-27: Prepare a Land Use Sequestration Analysis to Quantify and Mitigate (as Needed) GHG Flux Associated with Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-27 under Impact AQ-27 in the discussion of Alternative 1A.

22.3.3.15 Alternative 8—Dual Conveyance with Pipeline/Tunnel, Intakes 2, 3, and 5, and Increased Delta Outflow (9,000 cfs; Operational Scenario F)

For the purposes of this analysis, it was assumed that Intakes 2, 3, and 5 (on the east bank of the Sacramento River) would be constructed under Alternative 8. Under this alternative, an intermediate forebay would also be constructed, and the conveyance facility would be a buried pipeline and tunnels (Figures 3-2 and 3-11 in Chapter 3, *Description of Alternatives*).

Construction and operation of Alternative 8 would require the use of electricity, which would be supplied by the California electrical grid. Power plants located throughout the state supply the grid with power, which will be distributed to the Study area to meet project demand. Power supplied by statewide power plants will generate criteria pollutants. Because these power plants are located throughout the state, criteria pollutant emissions associated with Alternative 8 electricity demand cannot be ascribed to a specific air basin or air district within the Study area. Criteria pollutant emissions from electricity consumption are therefore provided for informational purposes only and are not included in the impact conclusion.

Construction and operational activities required for Alternative 8 was assumed to equal activity required for Alternative 7. Construction and operational emissions generated by Alternative 7 would therefore be representative of emissions generated by Alternative 8. Refer to Table 22-131 for a summary of criteria pollutants during construction (years 2016 through 2029) and Table 22-132 for a summary of criteria pollutants during long-term operation. While operations and maintenance activities among Alternatives 7 and 8 would be the same, emissions from electricity consumption would differ and are provided in Table 22-138. Negative values represent an emissions benefit, relative to the No Action Alternative or Existing Conditions.

Table 22-138. Criteria Pollutant Emissions from Electricity Consumption: Net Project Operations, Alternative 8 (tons/year)

Year	Analysis	ROG	CO	NO_X	PM10	PM2.5[c]	SO_2
ELT	CEQA	-3	-29	-400	-34	-34	-169
LLT	NEPA	-2	-21	-287	-24	-24	-121
LLT	CEQA	-3	-33	-453	-38	-38	-191

NEPA = Compares criteria pollutant emissions after implementation of Alternative 8 to the No Action Alternative.

CEQA = Compares criteria pollutant emissions after implementation of Alternative 8 to Existing Conditions.

[a] Emissions assume implementation of RPS (see Appendix 22A, *Air Quality Analysis Methodology*). Power plants that generate electricity for the proposed project would be subject to local air district permitting requirements, including standards to implement BACT to reduce criteria pollutant emissions.

[b] Because GHG emissions are cumulative (see Section 22.3.2.1) and not evaluated at the local air basin or air district level, they are discussed in Impacts AQ-21 and AQ-22. The GHG analysis for SWP power utilizes actual and forecasted GHG emissions rates for the SWP system, which differs slightly from the above analysis. Statewide grid average emission factors were utilized for the above analysis as criteria pollutant emission factors for SWP were unavailable. Please also note that the above analysis does not account for additional renewable energy that will be procured through modifications to DWR's REPP (see Impact AQ-22). Accordingly, the emissions results presented above represent a conservative assessment of potential criteria pollutant emissions.

[c] Emission factors for PM2.5 are currently unavailable. Consequently, PM2.5 emissions were assumed to equal PM10 emissions. Because PM2.5 represents a fraction of PM10, this approach represents a conservative assessment of PM2.5 emissions from electricity consumption.

Impact AQ-1: Generation of Criteria Pollutants in Excess of the SMAQMD Regional Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: Construction activity required for Alternative 8 was assumed to equal activity required for Alternative 7. Emissions generated by Alternative 7 would therefore be representative of emissions generated by Alternative 8. As shown in Table 22-131, emissions would exceed SMAQMD's daily NO_X threshold, even with implementation of environmental commitments. Since NO_X is a precursor to ozone and PM, exceedances of SMAQMD's daily NO_X threshold could impact both regional ozone and PM formation, which could worsen regional air quality and air basin attainment of the NAAQS and CAAQS.

While equipment could operate at any work area identified for this alternative, the highest level of NO_X and fugitive dust emissions in the SMAQMD are expected to occur at those sites where the duration and intensity of construction activities would be greatest. This includes all intake and intake pumping plant sites along the east bank of the Sacramento River, as well as the intermediate forebay (and pumping plant) site west of South Stone Lake and east of the Sacramento River. See the discussion of Impact AQ-1 under Alternative 7.

Environmental commitments will reduce construction-related emissions; however, as shown in Table 22-131, NO_X emissions would still exceed SMAQMD's threshold identified in Table 22-8 and would result in an adverse effect to air quality. Mitigation Measures AQ-1a and AQ-1b would be available to reduce NO_X emissions, and would thus address regional effects related to secondary ozone and PM formation.

***CEQA Conclusion*:** NO_X emissions generated during construction would exceed SMAQMD threshold identified in Table 22-8. Since NO_X is a precursor to ozone and PM, exceedances of SMAQMD's daily NO_X threshold could impact both regional ozone and PM formation. SMAQMD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS or NAAQS. The impact of generating NO_X emissions in excess of local air district thresholds would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. This would be a significant impact. Mitigation Measures AQ-1a and AQ-1b would be available to reduce NO_X emissions to a less-than-significant level by offsetting emissions to quantities below SMAQMD CEQA thresholds (see Table 22-8).

Mitigation Measure AQ-1a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-1a under Impact AQ-1 in the discussion of Alternative 1A.

Mitigation Measure AQ-1b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-1b under Impact AQ-1 in the discussion of Alternative 1A.

Impact AQ-2: Generation of Criteria Pollutants in Excess of the YSAQMD Regional Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: Construction activity required for Alternative 8 within the YSAQMD was assumed to equal activity required for Alternative 7. Emissions generated by Alternative 7 would therefore be representative of emissions generated by Alternative 8. As shown in Table 22-131, emissions would exceed YSAQMD's NO_X and PM10 thresholds, even with implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*).

Since NO_X is a precursor to ozone and PM, exceedances of SMAQMD's daily NO_X threshold could impact both regional ozone and PM formation, which could worsen regional air quality and air basin attainment of the NAAQS and CAAQS. Similarly, exceedances of YSAQMD's PM10 threshold could impede attainment of the NAAQS and CAAQS for PM10. All emissions generated within YSAQMD are a result of haul truck movement for equipment and material delivery.

Environmental commitments outlined in Appendix 3B, *Environmental Commitments,* will reduce construction-related emissions; however, as shown in Table 22-131, NO_X and PM10 emissions would still exceed the applicable YSAQMD thresholds identified in Table 22-8 and result in an adverse regional effect to air quality. Mitigation Measures AQ-1a and AQ-1b are available to reduce NO_X and PM10 emissions, and would thus address regional effects related to secondary ozone and PM formation.

***CEQA Conclusion*:** Emissions of NO_X and PM10 generated during construction would exceed YSAQMD's regional thresholds identified in Table 22-8. Since NO_X is a precursor to ozone and NO_X is a precursor to PM, exceedances of YSAQMD's NO_X threshold could impact both regional ozone and

PM formation, which could worsen regional air quality and air basin attainment of the NAAQS and CAAQS. Similarly, exceedances of YSAQMD's PM10 threshold could impede attainment of the NAAQS and CAAQS for PM10. YSAQMD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS or NAAQS. The impact of generating NO_X and PM10 in excess of local air district regional thresholds would therefore violate applicable air quality standards in the study area and could contribute to or worsen an existing air quality conditions. This would be a significant impact. Mitigation Measures AQ-1a and AQ-1b would be available to reduce NO_X and PM10 emissions to a less-than-significant level by offsetting emissions to quantities below YSAQMD CEQA thresholds (see Table 22-8).

Mitigation Measure AQ-1a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-1a under Impact AQ-1 in the discussion of Alternative 1A.

Mitigation Measure AQ-1b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-1b under Impact AQ-1 in the discussion of Alternative 1A.

Impact AQ-3: Generation of Criteria Pollutants in Excess of the BAAQMD Regional Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: Construction activity required for Alternative 8 was assumed to equal activity required for Alternative 7. Emissions generated by Alternative 7 would therefore be representative of emissions generated by Alternative 8. As shown in Table 22-131, construction emissions would exceed BAAQMD's daily ROG and NO_X thresholds, even with implementation of environmental commitments. All other pollutants would be below air district thresholds and therefore would not result in an adverse air quality effect.

Since ROG and NO_X are precursors to ozone and NO_X is a precursor to PM, exceedances of BAAQMD's ROG and NO_X thresholds could impact both regional ozone and PM formation, which could worsen regional air quality and air basin attainment of the NAAQS and CAAQS.

While equipment could operate at any work area identified for this alternative, the highest level of ROG and NO_X emissions in the BAAQMD are expected to occur at those sites where the duration and intensity of construction activities would be greatest, including the site of the Byron Tract Forebay adjacent to and south of Clifton Court Forebay.

Environmental commitments outlined in Appendix 3B, *Environmental Commitments,* will reduce construction-related emissions; however, as shown in Table 22-131, ROG and NO_X emissions would still exceed BAAQMD's thresholds identified in Table 22-8 and would result in an adverse effect to air quality. Mitigation Measures AQ-3a and AQ-3b are available to reduce ROG and NO_X emissions, and would thus address regional effects related to secondary ozone and PM formation.

CEQA Conclusion: Emissions of ROG and NO_X generated during construction would exceed BAAQMD thresholds identified in Table 22-8. Since ROG and NO_X are precursors to ozone and NO_X is a precursor to PM, exceedances of BAAQMD's ROG and NO_X thresholds could impact both regional ozone and PM formation. BAAQMD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS or NAAQS. The impact of generating emissions in excess of local air district thresholds would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. This would be a significant impact. Mitigation Measures AQ-3a and AQ-3b would be available to reduce ROG and NO_X emissions to a less-than-significant level by offsetting emissions to quantities below BAAQMD CEQA thresholds (see Table 22-8).

Mitigation Measure AQ-3a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within BAAQMD/SFBAAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable BAAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-3a under Impact AQ-3 in the discussion of Alternative 1A.

Mitigation Measure AQ-3b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the BAAQMD/SFBAAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable BAAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-3b under Impact AQ-3 in the discussion of Alternative 1A.

Impact AQ-4: Generation of Criteria Pollutants in Excess of the SJVAPCD Regional Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: Construction activity required for Alternative 8 was assumed to equal activity required for Alternative 7. Emissions generated by Alternative 7 would therefore be representative of emissions generated by Alternative 8. As shown in Table 22-131, construction emissions would exceed SJVAPCD's annual ROG, NO_X, and PM10 thresholds, even with implementation of environmental commitments. All other pollutants would be below air district thresholds and therefore would not result in an adverse air quality effect.

Since ROG and NO_X are precursors to ozone and NO_X is a precursor to PM, exceedances of SJVAPCD's ROG and NO_X thresholds could impact both regional ozone and PM formation, which could worsen regional air quality and air basin attainment of the NAAQS and CAAQS. Similarly, exceedances of SJVAPCD's PM10 threshold could impede attainment of the NAAQS and CAAQS for PM10.

While equipment could operate at any work area identified for this alternative, the highest level of ROG, NO_X, and PM10 emissions in the SJVAPCD is expected to occur at those sites where the duration and intensity of construction activities would be greatest. This includes all temporary and permanent utility sites, as well as all construction sites along the pipeline/tunnel conveyance alignment. For a map of the proposed tunnel alignment, see Mapbook Figure M3-1. See the discussion of Impact AQ-4 under Alternative 7.

Environmental commitments outlined in Appendix 3B, *Environmental Commitments,* will reduce construction-related emissions; however, as shown in Table 22-131, ROG, NO_X, and PM10 emissions would still exceed SJVAPCD's thresholds identified in Table 22-8 and would result in an adverse effect to air quality. Mitigation Measures AQ-4a and AQ-4b are available to reduce ROG, NO_X, and PM10 emissions, and would thus address regional effects related to secondary ozone and PM formation.

CEQA Conclusion: Emissions of ROG, NO_X, and PM10 generated during construction would exceed SJVAPCD's annual significance threshold identified in Table 22-8. Since ROG and NO_X are precursors to ozone and NO_X is a precursor to PM, exceedances of SJVAPCD's ROG and NO_X thresholds could impact both regional ozone and PM formation, which could worsen regional air quality and air basin attainment of the NAAQS and CAAQS. Similarly, exceedances of SJVAPCD's PM10 threshold could impede attainment of the NAAQS and CAAQS for PM10. SJVAPCD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS or NAAQS. The impact of generating ROG, NO_X, and PM10 emissions in excess of local air district thresholds would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. This would be a significant impact. Mitigation Measures AQ-4a and AQ-4b would be available to reduce ROG, NO_X, and PM10 emissions to a less-than-significant level by offsetting emissions to quantities below SJVAPCD CEQA thresholds (see Table 22-8).

Mitigation Measure AQ-4a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4a under Impact AQ-4 in the discussion of Alternative 1A.

Mitigation Measure AQ-4b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4b under Impact AQ-4 in the discussion of Alternative 1A.

Impact AQ-5: Generation of Criteria Pollutants in Excess of the SMAQMD Regional Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance activities in SMAQMD required for Alternative 8 were assumed to equal activities required for Alternative 7. Emissions generated by Alternative 7 would therefore be representative of emissions generated by Alternative 8. As shown in Table 22-132, emissions would not exceed SMAQMD's regional thresholds of significance and there would be no adverse effect. See the discussion of Impact AQ-5 under Alternative 7.

CEQA Conclusion: Emissions generated during operation and maintenance activities would not exceed SMAQMD regional thresholds for criteria pollutants. SMAQMD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS or NAAQS. The impact of generating emissions in excess of local air district would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Because project operations would not exceed SMAQMD regional thresholds, the impact would be less than significant. No mitigation is required.

Impact AQ-6: Generation of Criteria Pollutants in Excess of the YSAQMD Regional Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Alternative 8 would not construct any permanent features in the YSAQMD that would require routine operations and maintenance. No operational emissions would be generated in the YSAQMD. Consequently, operation of Alternative 8 would neither exceed the YSAQMD thresholds of significance nor result in an adverse effect on air quality.

***CEQA Conclusion*:** No operational or maintenance emissions generated by the alternative would occur in YSAQMD and, therefore, YSAQMD's regional thresholds would not be exceeded (see Table 22-8). This impact would be less than significant. No mitigation is required.

Impact AQ-7: Generation of Criteria Pollutants in Excess of the BAAQMD Regional Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance activities in BAAQMD required for Alternative 8 were assumed to equal activities required for Alternative 7. Emissions generated by Alternative 7 would therefore be representative of emissions generated by Alternative 8. As shown in Table 22-132, emissions would not exceed BAAQMD's regional thresholds of significance and there would be no adverse effect. See the discussion of Impact AQ-7 under Alternative 7.

***CEQA Conclusion*:** Emissions generated during operation and maintenance activities would not exceed BAAQMD regional thresholds for criteria pollutants. BAAQMD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS or NAAQS. The impact of generating emissions in excess of local air district thresholds would violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Because project operations would not exceed BAAQMD regional thresholds, the impact would be less than significant. No mitigation is required.

Impact AQ-8: Generation of Criteria Pollutants in Excess of the SJVAPCD Regional Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance activities in SJVAPCD required for Alternative 8 were assumed to equal activities required for Alternative 7. Emissions generated by Alternative 7 would therefore be representative of emissions generated by Alternative 8. As shown in Table 22-132 emissions would not exceed SJVAPCD's regional thresholds of significance and there would be no adverse effect. See the discussion of Impact AQ-8 under Alternative 7.

***CEQA Conclusion*:** Emissions generated during operation and maintenance activities would not exceed SJVAPCD's regional thresholds of significance. SJVAPCD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district thresholds would violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Because project operations would not exceed SJVAPCD regional thresholds, the impact would be less than significant. No mitigation is required.

Impact AQ-9: Exposure of Sensitive Receptors to Health Hazards from Localized Particulate Matter in Excess of SMAQMD's Health-Based Concentration Thresholds

NEPA Effects: Alternative 8 is similar to Alternative 4 and involves the development of two less intakes (approximately 40% volumetric reduction) as compared to Alternative 1A. As such, the emissions generated by construction of Alternative 8 would be lower than Alternative 1A due to less construction activities. Localized health risk impacts resulting from emissions from Intakes 1 and 4 would be less or not occur due to absence in the development of these project features. Based on the emissions inventory conducted for the air quality analysis, development of Alternative 8 would result in 22% less PM10 and PM2.5 emissions as compared with Alternative 1A.

All annual PM10 and PM2.5 concentrations were found to be less than SMAQMD's annual thresholds for Alternative 1A. Because Alternative 8 would require less construction activity and generate fewer emissions than Alternative 1A, annual PM10 and PM2.5 concentrations from the development of Alternative 8 would also be less than the respective SMAQMD annual thresholds. However, as shown in Table 22-14, the maximum predicted 24-hour PM10 concentration for Alternative 1A would exceed SMAQMD's threshold of 2.5 $\mu g/m^3$. The modeled exceedances occur at 225 receptor locations near intakes and intake work areas. Because Alternative 8 would not involve the development of Intakes 1 and 4, emissions contributions from these intakes would not occur, but at fewer receptor locations than Alternative 1A. It is anticipated that Alternative 8 would still result in 24-hour PM10 exceedances. Accordingly, this alternative would expose a sensitive receptor to adverse levels of localized particulate matter concentrations. Mitigation Measure AQ-9 is available to address this effect.

CEQA Conclusion**:** Respirable particulates pose a human health hazard by bypassing the defenses within the mucous ciliary system and entering deep lung tissue. Construction of Alternative 8 would result in the short-term exposure of receptors to PM10 concentrations that exceed SMAQMD threshold. This would be a significant impact. Mitigation Measure AQ-9 outlines a tiered strategy to reduce PM10 concentrations and public exposure to a less-than-significant level.

Mitigation Measure AQ-9: Implement Measures to Reduce Re-Entrained Road Dust and Receptor Exposure to PM2.5 and PM10

Please see Mitigation Measure AQ-9 under Impact AQ-9 in the discussion of Alternative 1A.

Impact AQ-10: Exposure of Sensitive Receptors to Health Hazards from Localized Particulate Matter in Excess of YSAQMD's Health-Based Concentration Thresholds

NEPA Effects: Table 22-15 under Alternative 1A shows that the maximum predicted PM2.5 and PM10 concentrations are less than YSAQMD's adopted thresholds. Because Alternative 8 would require less construction activity and generate fewer emissions than Alternative 1A, annual PM10 and PM2.5 concentrations from the development of Alternative 8 would also be less than the respective YSAQMD annual thresholds. The project would also implement all air district-recommended onsite fugitive dust controls, such as regular watering. Accordingly, this alternative would not expose sensitive receptors to adverse levels of localized particulate matter concentrations.

CEQA Conclusion**:** Respirable particulates pose a human health hazard by bypassing the defenses within the mucous ciliary system and entering deep lung tissue. Construction of Alternative 1A would result in PM2.5 and PM10 concentrations at receptor locations that are below the significance thresholds established by the YSAQMD. Since Alternative 8 results in fewer overall emissions, localized particulate matter concentrations at analyzed receptors would not result in significant human health impacts. No mitigation is required.

Impact AQ-11: Exposure of Sensitive Receptors to Health Hazards from Localized Particulate Matter in Excess of BAAQMD's Health-Based Concentration Thresholds

NEPA Effects: Table 22-16 under Alternative 1A shows that the maximum predicted PM2.5 concentrations are less than BAAQMD's adopted thresholds. Because Alternative 8 would require less construction activity and generate fewer emissions than Alternative 1A, PM2.5 concentrations from the development of Alternative 8 would also be less than the respective BAAQMD annual thresholds. The project would also implement all air district-recommended onsite fugitive dust controls, such as regular watering. Accordingly, this alternative would not expose sensitive receptors to adverse levels of localized particulate matter concentrations.

CEQA Conclusion**:** Respirable particulates pose a human health hazard by bypassing the defenses within the mucous ciliary system and entering deep lung tissue. Construction of Alternative 1A would result in PM2.5 concentrations at receptor locations that are below the significance thresholds established by the BAAQMD. Since Alternative 8 results in fewer overall emissions, localized particulate matter concentrations at analyzed receptors would not result in significant human health impacts. No mitigation is required.

Impact AQ-12: Exposure of Sensitive Receptors to Health Hazards from Localized Particulate Matter in Excess of SJVAPCD's Health-Based Concentration Thresholds

NEPA Effects: Table 22-17 under Alternative 1A shows that with exception of 24-hour PM10, maximum predicted PM2.5 and PM10 concentrations are less than SJVAPCD's adopted thresholds. The 24-hour PM10 concentrations attributable to the project would exceed the SJVAPCD's significance threshold at one receptor location. Emissions from the tunnel construction activities and concrete batch plant contribute to the exceedance at this location. Though Alternative 8 would result in less construction activities than Alternative 1A, it is anticipated that the receptor impacted by emissions from the concrete batch plant and tunnel activities would remain. Accordingly, this alternative would expose a sensitive receptor to adverse levels of localized particulate matter concentrations. Mitigation Measure AQ-9 is available to address this effect.

CEQA Conclusion**:** Respirable particulates pose a human health hazard by bypassing the defenses within the mucous ciliary system and entering deep lung tissue. Construction of Alternative 8 would result in the short-term exposure of receptors to PM10 concentrations that exceed SJVAPCD's threshold. This would be a significant impact. Mitigation Measure AQ-9 outlines a tiered strategy to reduce PM10 concentrations and public exposure to a less-than-significant level.

Mitigation Measure AQ-9: Implement Measures to Reduce Re-Entrained Road Dust and Receptor Exposure to PM2.5 and PM10

Please see Mitigation Measure AQ-9 under Impact AQ-9 in the discussion of Alternative 1A.

Impact AQ-13: Exposure of Sensitive Receptors to Health Hazards from Localized Carbon Monoxide

NEPA Effects: Construction activity required for Alternative 8 would be similar to activity required for Alternative 7. Accordingly, the potential for Alternative 8 to result in CO hot-spots during construction would be the same as Alternative 7. Given that construction activities typically do not result in CO hot-spots, onsite concentrations must comply with OSHA standards, and CO levels dissipate as a function of distance, equipment-generated CO emissions (see Table 22-131) are not anticipated to result in adverse health hazards to sensitive receptors.

Construction traffic may contribute to increased roadway congestion, which could lead to conditions conducive to CO hot-spot formation. As shown in Table 19-8, the highest peak hour traffic volumes under BPBGPP—12,567 vehicles per hour—would occur on westbound Interstate 80 between Suisun Valley Road and State Route 12.[61] This is about half of the congested traffic volume modeled by BAAQMD (24,000 vehicles per hour) that would be needed to contribute to a localized CO hot-spot, and less than half of the traffic volume modeled by SMAQMD (31,600 vehicles per hour). Accordingly, construction traffic is not anticipated to result in adverse health hazards to sensitive receptors.

CEQA Conclusion**:** Continuous engine exhaust may elevate localized CO concentrations. Receptors exposed to these CO "hot-spots" may have a greater likelihood of developing adverse health effects. Construction sites are less likely to result in localized CO hot-spots due to the nature of construction activities (Sacramento Metropolitan Air Quality Management District 2014), which normally utilize diesel-powered equipment for intermittent or short durations. Moreover, construction sites must comply with the OSHA CO exposure standards for onsite workers. Accordingly, given that construction activities typically do not result in CO hot-spots, onsite concentrations must comply with OSHA standards, and CO levels dissipate as a function of distance, equipment-generated CO emissions are not anticipated to result in significant health hazards to sensitive receptors. Similarly, peak-hour construction traffic on local roadways would not exceed BAAQMD's or SMAQMD's conservative screening criteria for the formation potential CO hot-spots. This impact would be less than significant. No mitigation is required.

Impact AQ-14: Exposure of Sensitive Receptors to Health Hazards from Diesel Particulate Matter in Excess of SMAQMD's Chronic Non-Cancer and Cancer Risk Thresholds

NEPA Effects: As shown in Table 22-18, Alternative 1A would not exceed the SMAQMD's thresholds for chronic non-cancer hazard or cancer risk. Because Alternative 8 would require less construction activity and generate fewer emissions than Alternative 1A, chronic non-cancer hazard and cancer risk from the development of Alternative 8 would also be less than the respective SMAQMD significance thresholds. Accordingly, this alternative would not expose sensitive receptors to adverse levels of DPM such as would result in chronic non-cancer hazards or cancer risk.

CEQA Conclusion**:** DPM generated during construction poses inhalation-related chronic non-cancer hazard and cancer risk if adjacent receptors are exposed to significant concentrations for prolonged durations. DPM generated during Alternative 8 construction would not exceed the SMAQMD's chronic non-cancer hazard or cancer risk threshold. Therefore, this impact for DPM emissions would be less than significant. No mitigation is required.

---

[61] The above volumes are based on the traffic analysis conducted for Alternative 1A. Since few vehicles would be required under Alternative 8, traffic impacts would likely be less than those estimated for Alternative 1A.

Impact AQ-15: Exposure of Sensitive Receptors to Health Hazards from Diesel Particulate Matter in Excess of YSAQMD's Chronic Non-Cancer and Cancer Risk Thresholds

NEPA Effects: As shown in Table 22-19, Alternative 1A would not exceed the YSAQMD's thresholds for chronic non-cancer hazard or cancer risk. Because Alternative 8 would require less construction activity and generate fewer emissions than Alternative 1A, chronic non-cancer hazard and cancer risk from the development of Alternative 8 would also be less than the respective YSAQMD significance thresholds. Accordingly, this alternative would not expose sensitive receptors to adverse levels of DPM such as would result in chronic non-cancer hazards or cancer risk.

***CEQA Conclusion*:** DPM generated during construction poses inhalation-related chronic non-cancer hazard and cancer risk if adjacent receptors are exposed to significant concentrations for prolonged durations. The DPM generated during Alternative 8 construction would not exceed the YSAQMD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial health hazards. Therefore, this impact for DPM emissions would be less than significant. No mitigation is required.

Impact AQ-16: Exposure of Sensitive Receptors to Health Hazards from Diesel Particulate Matter in Excess of BAAQMD's Chronic Non-Cancer and Cancer Risk Thresholds

NEPA Effects: As shown in Table 22-20, Alternative 1A would not exceed the BAAQMD's thresholds for chronic non-cancer hazard; however, it would exceed BAAQMD's cancer risk threshold. The primary emission sources for these exceedances are from a project haul route, control structure work area and potential spoil area. While the impact of Alternative 8 would be less than Alternative 1A, Alternative 8 may still expose sensitive receptors to adverse levels of carcinogenic DPM concentrations.

Mitigation Measure AQ-16 would be available to reduce exposure to substantial cancer risk by relocating affected receptors. Although Mitigation Measure AQ-16 would reduce the severity of this effect, the BDCP proponents are not solely responsible for implementation of the measure. If a landowner chooses not to accept DWR's offer of relocation assistance, an adverse effect in the form excess cancer risk above air district thresholds would occur. Therefore, this effect would be adverse. If, however, all landowners accept DWR's offer of relocation assistance, effects would not be adverse.

***CEQA Conclusion*:** DPM generated during construction poses inhalation-related chronic non-cancer hazard and cancer risk if adjacent receptors are exposed to significant concentrations for prolonged durations. The DPM generated during Alternative 8 construction would not exceed the BAAQMD's chronic non-cancer hazard threshold; however, it would exceed the BAAQMD's cancer thresholds. Therefore, this impact for DPM emissions would be significant.

Mitigation Measure AQ-16 would be available to reduce exposure to substantial cancer risk by relocating affected receptors. Although Mitigation Measure AQ-16 would reduce the severity of this effect, the BDCP proponents are not solely responsible for implementation of the measure. If a landowner chooses not to accept DWR's offer of relocation assistance, a significant impact in the form excess cancer risk above air district thresholds would occur. Therefore, this effect would be significant and unavoidable. If, however, all landowners accept DWR's offer of relocation assistance, the impact would be less than significant.

Mitigation Measure AQ-16: Relocate Sensitive Receptors to Avoid Excess Cancer Risk

Please see Mitigation Measure AQ-16 under Impact AQ-16 in the discussion of Alternative 1A.

Impact AQ-17: Exposure of Sensitive Receptors to Health Hazards from Diesel Particulate Matter in Excess of SJVAPCD's Chronic Non-Cancer and Cancer Risk Thresholds

NEPA Effects: Table 22-21 under Alternative 1A shows that the maximum predicted chronic non-cancer hazard and cancer risk associated with the project are less than SJVAPCD's adopted thresholds. Because Alternative 8 would require less construction activity and generate fewer emissions than Alternative 1A, chronic non-cancer hazard and cancer risk from the development of Alternative 8 would also be less than the respective SJVAPCD significance thresholds. Accordingly, this alternative would not expose sensitive receptors to adverse levels of DPM such as would result in chronic non-cancer hazards or cancer risk.

CEQA Conclusion**:** DPM generated during construction poses inhalation-related chronic non-cancer hazard and cancer risk if adjacent receptors are exposed to significant concentrations for prolonged durations. The DPM generated during Alternative 8 construction would not exceed the SJVAPCD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this impact for DPM emissions would be less than significant. No mitigation is required.

Impact AQ-18: Exposure of Sensitive Receptors to *Coccidioides immitis* (Valley Fever)

NEPA Effects**:** As discussed under Alternative 1A, earthmoving activities during construction could release *C. immitis* spores if filaments are present and other soil chemistry and climatic conditions are conducive to spore development. Receptors adjacent to the construction area may therefore be exposed to increase risk of inhaling *C. immitis* spores and subsequent development of Valley Fever. Dust-control measures are the primary defense against infection (United States Geological Survey 2000). Implementation of advanced air-district recommended fugitive dust controls outlined in Appendix 3B, *Environmental Commitments*, would avoid dusty conditions and reduce the risk of contracting Valley Fever through routine watering and other controls. Therefore, this alternative's effect of exposure of sensitive receptors to increased Valley Fever risk during construction would not be adverse.

CEQA Conclusion**:** Construction of the water conveyance facility would involve earthmoving activities that could release *C. immitis* spores if filaments are present and other soil chemistry and climatic conditions are conducive to spore development. Receptors adjacent to the construction area may therefore be exposed to increase risk of inhaling *C. immitis* spores and subsequent development of Valley Fever. Implementation of air-district recommended fugitive dust controls outlined in Appendix 3B, *Environmental Commitments*, would avoid dusty conditions and reduce the risk of contracting Valley Fever through routine watering and other controls. Therefore, this impact would be less than significant. No mitigation is required.

Impact AQ-19: Creation of Potential Odors Affecting a Substantial Number of People during Construction or Operation of the Proposed Water Conveyance Facility

NEPA Effects: As discussed under Alternative 1A, odors from construction activities would be localized and generally confined to the immediate area surrounding the construction site. Moreover, odors would be temporary and localized, and they would cease once construction activities have

been completed. Thus, it is not anticipated that construction of CM1 would create objectionable odors from construction equipment or asphalt paving.

Construction of the water conveyance facility would require removal of subsurface material during tunnel excavation and sediment removal. As discussed under Alternative 1A, geotechnical tests indicate that VOC levels in Plan Area soils are below the method detection limits, indicating that organic decay of exposed RTM and sediment will be relatively low (URS 2014). Moreover, drying and stockpiling of the removed RTM and sediment will occur under aerobic conditions, which will further limit any potential decomposition and associated malodorous products. Accordingly, it is not anticipated that tunnel and sediment excavation would create objectionable odors.

Typical facilities known to produce odors include landfills, wastewater treatment plants, food processing facilities, and certain agricultural activities. Alternative 8 would not result in the addition of facilities associated with odors, and as such, long-term operation of the water conveyance facility would not result in objectionable odors.

CEQA Conclusion: Alternative 8 would not result in the addition of major odor producing facilities. Diesel emissions during construction could generate temporary odors, but these would quickly dissipate and cease once construction is completed. Likewise, potential odors generated during asphalt paving would be addressed through mandatory compliance with air district rules and regulations. While tunnel excavation would unearth substantial quantities of RTM, geotechnical tests indicate that soils in the Plan Area have relatively low organic constituents. Moreover, drying and stockpiling of the removed RTM will occur under aerobic conditions, which will further limit any potential decomposition and associated malodorous products. Accordingly, the impact of exposure of sensitive receptors to potential odors during construction would be less than significant. No mitigation is required.

Impact AQ-20: Generation of Criteria Pollutants in the Excess of Federal *De Minimis* Thresholds from Construction and Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: As discussed above, emissions generated by Alternative 7 within the SFNA, SJVAB, and SFBAAB would be representative of emissions generated by Alternative 8 (see Table 22-133).

Sacramento Federal Nonattainment Area

As shown in Table 22-133, implementation of Alternative 7 (and thus Alternative 8), would exceed the following SFNA federal *de minimis* thresholds:

- ROG: 2024–2025
- NO_X: 2018–2028

ROG and NO_X are precursors to ozone, for which the SFNA is in nonattainment for the NAAQS. Since project emissions exceed the federal *de minimis* thresholds for ROG and NO_X, a general conformity determination must be made to demonstrate that total direct and indirect emissions of NO_X would conform to the appropriate SFNA SIP for each year of construction in which the *de minimis* thresholds are exceeded.

NO_X is also a precursor to PM and can contribute to PM formation. As discussed above, Sacramento County is currently designated maintenance for the PM10 NAAQS and portions of the SVAB are designated nonattainment for the PM2.5 NAAQS. NO_X emissions in excess of 100 tons per year in

Sacramento County trigger a secondary PM10 precursor threshold, whereas NO_X emissions in excess of 100 tons per year in the SVAB trigger a secondary PM2.5 precursor threshold. Since NO_X emissions can contribute to PM formation, NO_X emissions in excess of these secondary precursor thresholds could conflict with the applicable PM10 and PM2.5 SIPs. Accordingly, NO_X offsets pursued for the purposes of general conformity for those years in which NO_X emissions exceed 100 tons must occur within the federally designated PM2.5 nonattainment and PM10 maintenance areas of the SVAB.

As shown in Table 22-131, NO_X emissions generated by construction activities in SMAQMD (Sacramento County) would exceed 100 tons per year between 2022 and 2027. The project therefore triggers the secondary PM10 precursor threshold, requiring all NO_X offsets for 2022 through 2027 to occur within Sacramento County.

Given the magnitude of NO_X emissions and the limited geographic scope available for offsets in 2022 through 2027 (Sacramento County), neither Mitigation Measures AQ-1a nor 1b could feasibly reduce NO_X emissions to net zero for the purposes of general conformity.[62] This impact would be adverse. In the event that Alternative 8 is selected as the APA, Reclamation, USFWS, and NMFS would need to demonstrate that conformity is met for NO_X and secondary PM10 formation through a local air quality modeling analysis (i.e., dispersion modeling) or other acceptable methods to ensure project emissions do not cause or contribute to any new violations of the NAAQS or increase the frequency or severity of any existing violations.

Mitigation Measure AQ-1a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-1a under Impact AQ-1 in the discussion of Alternative 1A.

Mitigation Measure AQ-1b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-1b under Impact AQ-1 in the discussion of Alternative 1A.

San Joaquin Valley Air Basin

As shown in Table 22-133, implementation of Alternative 7 (and thus Alternative 8) would exceed the following SJVAB federal *de minimis* thresholds:

- ROG: 2020–2025
- NO_X: 2019–2026

---

[62] The secondary PM precursor thresholds are triggered through the General Conformity Regulation (40 CFR 93.153 (a)(1)). Accordingly, confinement of the geographic scope for available offsets only applies to the General Conformity determination and does not influence mitigation feasibility for Impacts AQ-1 or AQ-28.

ROG and NO_X are precursors to ozone and NO_X is a precursor to PM, for which the SJVAB is in nonattainment for the NAAQS. Since project emissions exceed the federal *de minimis* threshold for ROG and NO_X, a general conformity determination must be made to demonstrate that total direct and indirect emissions of ROG and NO_X would conform to the appropriate SJVAB SIP for each year of construction in which the *de minimis* thresholds are exceeded.

NO_X is also a precursor to PM and can contribute to PM formation. As discussed above, the SJVAB is currently designated maintenance for the PM10 NAAQS and nonattainment for the PM2.5 NAAQS. NO_X emissions in excess of 100 tons per year trigger a secondary PM precursor threshold, and could conflict with the applicable PM10 and PM2.5 SIPs. As shown in Table 22-133, NO_X emissions generated by construction activities in the SJVAB would exceed 100 tons per year between 2020 and 2024. NO_X offsets pursued for the purposes of general conformity for those years in which NO_X emissions exceed 100 tons must occur within the federally designated PM2.5 nonattainment and PM10 maintenance areas of the SJVAB, which are consistent with the larger nonattainment boundary for ozone.

As shown in Appendix 22E, *General Conformity Determination,* Attachment 22E-1, SJVAPCD confirms that sufficient emissions reduction credits would be available to fully offset ROG and NO_X emissions in excess of the federal *de minimis* thresholds zero through implementation of Mitigation Measures AQ-4a and 4b. Mitigation Measures AQ-4a and 4b will ensure the requirements of the mitigation and offset program are implemented and conformity requirements for ROG and NO_X are met, should Alternative 8 be selected as the APA.

Mitigation Measure AQ-4a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4a under Impact AQ-4 in the discussion of Alternative 1A.

Mitigation Measure AQ-4b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4b under Impact AQ-4 in the discussion of Alternative 1A.

San Francisco Bay Area Air Basin

As shown in Table 22-133, implementation of the Alternative 7 (and thus Alternative 8) would not exceed any of the SFBAAB federal *de minimis* thresholds. Accordingly, a general conformity determination is not required as total direct and indirect emissions would conform to the appropriate SFBAAB SIPs.

***CEQA Conclusion*:** SFNA and SJVAB are classified as nonattainment areas with regard to the ozone NAAQS and the impact of increases in criteria pollutant emissions above the air basin *de minimis* thresholds could conflict with or obstruct implementation of the applicable air quality plans. Since construction emissions in the SFNA and SJVAB would exceed the *de minimis* thresholds for ROG and NO_X, this impact would be significant.

Mitigation Measures AQ-4a and AQ-4b would ensure project emissions would not result in an increase in regional ROG or NO_X in the SJVAB. These measures would therefore ensure total direct and indirect ROG and NO_X emissions generated by the project would conform to the appropriate SJVAB SIPs by offsetting the action's emissions in the same or nearby area to net zero. Accordingly, impacts would be less than significant with mitigation in the SJVAB.

Although Mitigation Measures AQ-1a and AQ-1b would reduce NO_X in the SFNA, given the magnitude of NO_X emissions and the limited geographic scope available for offsets (Sacramento County), neither measure could feasibly reduce NO_X emissions to net zero for the purposes of general conformity. This impact would be significant and unavoidable in the SFNA.

Emissions generated within the SFBAAB would not exceed the SFBAAB de minimis thresholds and would therefore conform to the appropriate SFBAAB SIPs. No mitigation is required.

Impact AQ-21: Generation of Cumulative Greenhouse Gas Emissions during Construction of the Proposed Water Conveyance Facility

NEPA Effects: Construction activity required for Alternative 8 was assumed to equal activity required for Alternative 7. Emissions generated by Alternative 7 would therefore be representative of emissions generated by Alternative 7. As shown in Table 22-134, construction of Alternative 8 would generate a total of 2.1 million metric tons of GHG emissions. As discussed in section 22.3.2, *Determination of Effects*, any increase in emissions above net zero associated with construction of the BDCP water conveyance features would be adverse. Accordingly, this effect would be adverse. Mitigation Measure AQ-21, which would develop a GHG Mitigation Program to reduce construction-related GHG emissions to net zero, is available address this effect.

***CEQA Conclusion*:** Construction of Alternative 8 would generate a total of 2.1 million metric tons of GHG emissions. This is equivalent to adding approximately 450,000 typical passenger vehicles to the road during construction (U.S. Environmental Protection Agency 2014e). As discussed in section 22.3.2, *Determination of Effects*, any increase in emissions above net zero associated with construction of the BDCP water conveyance features would be significant. Mitigation Measure AQ-21 would develop a GHG Mitigation Program to reduce construction-related GHG emissions to net zero. Accordingly, this impact would be less-than-significant with implementation of Mitigation Measure AQ-21.

Mitigation Measure AQ-21: Develop and Implement a GHG Mitigation Program to Reduce Construction Related GHG Emissions to Net Zero (0)

Please see Mitigation Measure AQ-21 under Impact AQ-1 in the discussion of Alternative 1A.

Impact AQ-22: Generation of Cumulative Greenhouse Gas Emissions from Operation and Maintenance of the Proposed Water Conveyance Facility and Increased Pumping

NEPA Effects: Operation of Alternative 8 would generate direct and indirect GHG emissions. Sources of direct emissions include heavy-duty equipment, on road crew trucks, and employee vehicle traffic. Indirect emissions would be generated predominantly by electricity consumption required for pumping as well as, maintenance, lighting, and other activities.

Table 22-139 summarizes long-term operational GHG emissions associated with operations, maintenance, and increased SWP pumping. Emissions were quantified for both ELT and LLT conditions, although activities would take place annually until project decommissioning. Emissions include state mandates to reduce GHG emissions (described in Impact AQ-21) are presented (there are no BDCP specific operational environmental commitments). Total CO_2e emissions are compared to both the No Action Alternative (NEPA point of comparison) and Existing Conditions (CEQA baseline). As discussed in Section 22.3.1.2, equipment emissions are assumed to be zero under both the No Action Alternative (NEPA point of comparison) and Existing Conditions (CEQA baseline). The equipment emissions presented in Table 22-139 are therefore representative of project impacts for both the NEPA and CEQA analysis.

Table 22-139. GHG Emissions from Operation, Maintenance, and Increased SWP Pumping, Alternative 8 (metric tons/year)

		Electricity CO_{2e}		Total CO_2e	
Condition	Equipment CO_2e	NEPA Point of Comparison	CEQA Baseline	NEPA Point of Comparison	CEQA Baseline
ELT	386	-	-74,142	-	-73,756
LLT	379	-53,076	-84,032	-52,696	-83,652

Note: The *NEPA point of comparison* compares total CO_2e emissions after implementation of Alternative 8 to the No Action Alternative, whereas the *CEQA baseline* compares total CO_2e emissions to Existing Conditions. Negative values represent a net GHG reduction.

Table 22-137 summarizes equipment CO_2e emissions that would be generated in the BAAQMD, SMAQMD, and SJVAPCD (no operation emissions would be generated in the YSAQMD). The table does not include emissions from SWP pumping as these emissions would be generated by power plants located throughout the state (see discussion preceding this impact analysis). GHG emissions presented in Table 22-137 are therefore provided for information purposes only.

SWP Operational and Maintenance GHG Emissions Analysis

Alternative 8 would not add any additional net electricity demand to operation of the SWP and would in fact result in a net reduction in electricity demand (see Table 22-139). Therefore, there will be no impact on SWP operational emissions.

A small amount of additional GHG emissions from equipment would be emitted as a result of the maintenance of new facilities associated with Alternative 8 (Table 22-139). Emissions from additional maintenance activities would become part of the overall DWR maintenance program for the SWP and would be managed under DWR's CAP.

The CAP sets forth DWR's plan to manage its activities and operations to achieve its GHG emissions reduction goals. The CAP commits DWR to monitoring its emissions each year and evaluating its emissions every five years to determine whether it is on a trajectory to achieve its GHG emissions reduction goals. If it appears that DWR will not meet the GHG emission reduction goals established in the plan, DWR may make adjustments to existing emissions reduction measures, devise new measures to ensure achievement of the goals, or take other action.

Consistent with the analysis contained in the CAP and associated Initial Study and Negative Declaration for the CAP, BDCP Alternative 8 would not adversely affect DWR's ability to achieve the GHG emissions reduction goals set forth in the CAP. Further, Alternative 8 would not conflict with any of DWR's specific action GHG emissions reduction measures and implements all applicable project level GHG emissions reduction measures as set forth in the CAP. BDCP Alternative 8 is therefore consistent with the analysis performed in the CAP. There would be no adverse effect.

***CEQA Conclusion*:** SWP GHG emissions currently are below 1990 levels and achievement of the goals of the CAP means that total DWR GHG emissions will be reduced to 50% of 1990 levels by 2020 and to 80% of 1990 levels by 2050. The implementation of BDCP Alternative 8 would not affect DWR's established emissions reduction goals or baseline (1990) emissions and therefore would not result in a change in total DWR emissions that would be considered significant. Prior adoption of the CAP by DWR already provides a commitment on the part of DWR to make all necessary modifications to DWR's REPP (as described above) or any other GHG emission reduction measure in the CAP that are necessary to achieve DWR's GHG emissions reduction goals. Therefore no amendment to the approved CAP is necessary to ensure the occurrence of the additional GHG emissions reduction activities needed to account for BDCP-related operational or maintenance emissions. The effect of BDCP Alternative 8 with respect to GHG emissions is less than cumulatively considerable and therefore less than significant. No mitigation is required.

Impact AQ-23: Generation of Cumulative Greenhouse Gas Emissions from Increased CVP Pumping as a Result of Implementation of CM1

NEPA Effects: As previously discussed, DWR's CAP cannot be used to evaluate environmental impacts associated with increased CVP pumping, as emissions associated with CVP are not under DWR's control and are not included in the CAP. Accordingly, GHG emissions resulting from increased CVP energy use are evaluated separately from GHG emissions generated as a result of SWP energy use.

Under Alternative 8, operation of the CVP yields the generation of clean, GHG emissions-free, hydroelectric energy. This electricity is sold into the California electricity market or directly to energy users. Analysis of the existing and future no action condition indicates that the CVP generates and will continue to generate all of the electricity needed to operate the CVP system and approximately 3,500 GWh of excess hydroelectric energy that would be sold to energy users throughout California.

Implementation of Alternative 8 is neither expected to require additional electricity over the No Action Alternative nor reduce the amount of excess CVP generation available for sale from the CVP to electricity users. The CVP is operated using energy generated at CVP hydroelectric facilities and therefore results in no GHG emissions. Rather, implementation of Alternative 8 would reduce GHG emissions by 48,058 to 61,845 metric tons of CO_2e, relative to the No Action Alternative (depending on whether the RPS is assumed in the emissions calculations). Accordingly, there would be no adverse effect.

***CEQA Conclusion*:** Implementation of Alternative 8 is neither expected to require additional electricity over Existing Conditions nor reduce the amount of excess CVP generation available for sale from the CVP to electricity users. All power supplied to CVP facilities would continue to be supplied by GHG emissions-free hydroelectricity and there would be no increase in GHG emissions over Existing Conditions as a result of CVP operations. The impact would be less than significant and no mitigation is required.

Impact AQ-24: Generation of Criteria Pollutants from Implementation of CM2–CM11

NEPA Effects: Table 22-29 summarizes potential construction and operational emissions that may be generated by implementation of CM2–CM11. See the discussion of Impact AQ-24 under Alternative 1A.

Criteria pollutants from restoration and enhancement actions could exceed applicable general conformity *de minimis* levels and applicable local thresholds. The effect would vary according to the equipment used in construction of a specific conservation measure, the location, the timing of the actions called for in the conservation measure, and the air quality conditions at the time of implementation; these effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. The effect of increases in emissions during implementation of CM2–CM11 in excess of applicable general conformity *de minimis* levels and air district regional thresholds (Table 22-8) could violate air basin SIPs and worsen existing air quality conditions. Mitigation Measure AQ-24 would be available to reduce this effect, but emissions would still be adverse.

***CEQA Conclusion*:** Construction and operational emissions associated with the restoration and enhancement actions would result in a significant impact if the incremental difference, or increase, relative to Existing Conditions exceeds the applicable local air district thresholds shown in Table 22-8; these effects are expected to be further evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measure AQ-24 would be available to reduce this effect, but may not be sufficient to reduce emissions below applicable air quality management district thresholds (see Table 22-8). Consequently, this impact would be significant and unavoidable.

Mitigation Measure AQ-24: Develop an Air Quality Mitigation Plan (AQMP) to Ensure Air District Regulations and Recommended Mitigation are Incorporated into Future Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-24 under Impact AQ-24 in the discussion of Alternative 1A.

Impact AQ-25: Exposure of Sensitive Receptors to Health Hazards from Localized Particulate Matter, Carbon Monoxide, and Diesel Particulate Matter from Implementation of CM2–CM11

NEPA Effects: The potential for Alternative 8 to expose sensitive receptors increased health hazards from localized PM, CO, and DPM would be similar to Alternative 1A. Activities shown in Table 22-29 with the greatest potential to have short or long-term air quality impacts are also anticipated to have the greatest potential to expose receptors to substantial pollutant concentrations. The effect would vary according to the equipment used, the location and timing of the actions called for in the conservation measure, the meteorological and air quality conditions at the time of implementation, and the location of receptors relative to the emission source. Potential health effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions.

The effect of increases in PM, CO, or DPM (cancer and non-cancer-risk) in excess of applicable air district thresholds (Table 22-8) at receptor locations could result in adverse health impacts. Mitigation Measures AQ-24 and AQ-25 would be available to reduce this effect.

***CEQA Conclusion*:** Construction and operational emissions associated with the restoration and enhancement actions under Alternative 8 would result in a significant impact if PM, CO, or DPM (cancer and non-cancer-risk) concentrations at receptor locations exceed the applicable local air district thresholds shown in Table 22-8; these effects are expected to be further evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measures AQ-24 and AQ-25 would ensure localized concentrations at receptor locations would be below applicable air quality management district thresholds (see Table 22-8). Consequently, this impact would be less than significant.

Mitigation Measure AQ-24: Develop an Air Quality Mitigation Plan (AQMP) to Ensure Air District Regulations and Recommended Mitigation are Incorporated into Future Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-24 under Impact AQ-24 in the discussion of Alternative 1A.

Mitigation Measure AQ-25: Prepare a Project-Level Health Risk Assessment to Reduce Potential Health Risks from Exposure to Localized DPM and PM Concentrations

Please see Mitigation Measure AQ-25 under Impact AQ-25 in the discussion of Alternative 1A.

Impact AQ-26: Creation of Potential Odors Affecting a Substantial Number of People from Implementation of CM2–CM11

NEPA Effects: The potential for Alternative 8 to expose sensitive receptors increased odors would be similar to Alternative 1A. Accordingly, construction activities associated with CM2-CM11 are not anticipated to result in nuisance odors. Similarly, while restored land uses associated with the program have the potential to generate odors from natural processes, the emissions would be similar in origin and magnitude to the existing land use types in the restored area (e.g., managed wetlands). Moreover, specific odor effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Accordingly, odor-related effects associated with CM2–CM11 would not be adverse.

***CEQA Conclusion*:** Alternative 8 would not result in the addition of major odor producing facilities. Diesel emissions during construction could generate temporary odors, but these would quickly dissipate and cease once construction is completed. Increases in wetland, tidal, and upland habitats may increase the potential for odors from natural processes. However, the origin and magnitude of odors would be similar to the existing land use types in the restored area (e.g., managed wetlands). Moreover, specific odor impacts would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Accordingly, the impact of exposure of sensitive receptors to potential odors would be less than significant. No mitigation is required.

Impact AQ-27: Generation of Cumulative Greenhouse Gas Emissions from Implementation of CM2–CM11

NEPA Effects: CM2–CM11 implemented under Alternative 8 would result in local GHG emissions from construction equipment and vehicle exhaust, similar to Alternative 1A. Restoration activities with the greatest potential for emissions include those that break ground and require use of earthmoving equipment. The type of restoration action and related construction equipment use are shown in Table 22-29. Implementing CM2–CM11 would also affect long-term sequestration rates through land use changes, such as conversion of agricultural land to wetlands, inundation of peat soils, drainage of peat soils, and removal or planting of carbon-sequestering plants.

Without additional information on site-specific characteristics associated with each of the restoration components, a complete assessment of GHG flux from CM2–CM11 is currently not possible. The effect of carbon sequestration and CH_4 generation would vary by land use type, season, and chemical and biological characteristics; these effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measures AQ-24 and AQ-27 would be available to reduce this effect. However, due to the potential for increases in GHG emissions from construction and land use change, this effect would be adverse.

***CEQA Conclusion*:** The restoration and enhancement actions under Alternative 8 could result in a significant impact if activities are inconsistent with applicable GHG reduction plans, do not contribute to a lower carbon future, or generate excessive emissions, relative to other projects throughout the state. These effects are expected to be further evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measures AQ-24 and AQ-27 would be available to reduce this impact, but may not be sufficient to reduce to a less-than-significant level. Consequently, this impact would be significant and unavoidable.

Mitigation Measure AQ-24: Develop an Air Quality Mitigation Plan (AQMP) to Ensure Air District Regulations and Recommended Mitigation are Incorporated into Future Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-24 under Impact AQ-24 in the discussion of Alternative 1A.

Mitigation Measure AQ-27: Prepare a Land Use Sequestration Analysis to Quantify and Mitigate (as Needed) GHG Flux Associated with Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-27 under Impact AQ-27 in the discussion of Alternative 1A.

22.3.3.16 Alternative 9—Through Delta/Separate Corridors (15,000 cfs; Operational Scenario G)

Under Alternative 9, two intakes would be constructed at the entrances to the Delta Cross Channel and Georgiana Slough. These intakes would consist of fish screens placed on the existing channels. Two small pumping plants would be constructed on the San Joaquin River at the head of Old River and on Middle River upstream of Victoria Canal. There would be no new forebay. The conveyance would be through existing canals and Delta channels, with modifications to the levees and channels, operable barriers, a fish movement corridor around Clifton Court Forebay, and a water supply corridor.

Construction and operation of Alternative 9 would require the use of electricity, which would be supplied by the California electrical grid. Power plants located throughout the state supply the grid with power, which will be distributed to the Study area to meet project demand. Power supplied by statewide power plants will generate criteria pollutants. Because these power plants are located throughout the state, criteria pollutant emissions associated with Alternative 9 electricity demand cannot be ascribed to a specific air basin or air district within the Study area. Criteria pollutant emissions from electricity consumption, which are summarized in Table 22-140, are therefore provided for informational purposes only and are not included in the impact conclusion. Negative values represent an emissions benefit, relative to the No Action Alternative or Existing Conditions.

Table 22-140. Criteria Pollutant Emissions from Electricity Consumption: Construction and Net Project Operations, Alternative 9 (tons/year) [a,b]

Year	Analysis	ROG	CO	NO_X	PM10	PM2.5[c]	SO_2
2016	-	0	0	0	0	0	0
2017	-	0	0	0	0	0	0
2018	-	<1	<1	<1	<1	<1	<1
2019	-	<1	<1	<1	<1	<1	<1
2020	-	<1	2	<1	<1	<1	1
2021	-	<1	4	<1	<1	<1	2
2022	-	<1	6	<1	1	1	3
2023	-	<1	5	<1	<1	<1	2
2024	-	<1	6	<1	<1	<1	2
2025	-	<1	4	<1	<1	<1	2
2026	-	<1	1	<1	<1	<1	1
2027	-	<1	<1	<1	<1	<1	<1
2028	-	<1	<1	<1	<1	<1	<1
2029	-	<1	<1	<1	<1	<1	<1
ELT	CEQA	-1	-9	-118	-10	-10	-50
LLT	NEPA	<0	-1	-12	-1	-1	-5
LLT	CEQA	-1	-13	-178	-15	-15	-75

NEPA = Compares criteria pollutant emissions after implementation of Alternative 9 to the No Action Alternative.

CEQA = Compares criteria pollutant emissions after implementation of Alternative 9 to Existing Conditions.

[a] Emissions assume implementation of RPS (see Appendix 22A, *Air Quality Analysis Methodology*). Power plants that generate electricity for the proposed project would be subject to local air district permitting requirements, including standards to implement BACT to reduce criteria pollutant emissions.

[b] Because GHG emissions are cumulative (see Section 22.3.2.1) and not evaluated at the local air basin or air district level, they are discussed in Impacts AQ-21 and AQ-22. The GHG analysis for SWP power utilizes actual and forecasted GHG emissions rates for the SWP system, which differs slightly from the above analysis. Statewide grid average emission factors were utilized for the above analysis as criteria pollutant emission factors for SWP were unavailable. Please also note that the above analysis does not account for additional renewable energy that will be procured through modifications to DWR's REPP (see Impact AQ-22). Accordingly, the emissions results presented above represent a conservative assessment of potential criteria pollutant emissions.

[c] Emission factors for PM2.5 are currently unavailable. Consequently, PM2.5 emissions were assumed to equal PM10 emissions. Because PM2.5 represents a fraction of PM10, this approach represents a conservative assessment of PM2.5 emissions from electricity consumption.

Construction activities would generate emissions of ozone precursors (ROG and NO_X), CO, PM10, PM2.5, and SO_2. Table 22-141 summarizes criteria pollutant emissions that would be generated in the BAAQMD, SMAQMD, and SJVAPCD in pounds per day and tons per year (no construction emissions would be generated in the YSAQMD). Emissions estimates include implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*). Although emissions are presented in different units (pounds and tons), the amounts of emissions are identical (i.e., 2,000 pounds is identical to 1 ton). Summarizing emissions in both pounds per day and tons per year is necessary to evaluate project-level effects against the appropriate air district thresholds, which are given in both pounds and tons (see Table 22-8).

As shown in Appendix 22B, *Air Quality Assumptions*, construction activities during several phases will likely occur concurrently. To ensure a conservative analysis, the maximum daily emissions during these periods of overlap were estimated assuming all equipment would operate at the same time—this gives the maximum total project-related air quality impact during construction. Accordingly, the daily emissions estimates represent a conservative assessment of construction impacts. Exceedances of the air district thresholds are shown in underlined text.

Table 22-141. Criteria Pollutant Emissions from Construction of Alternative 9 (pounds/day and tons/year)

	Maximum Daily Emissions (pounds/day)										Annual Emissions (tons/year)									
	Bay Area Air Quality Management District										Bay Area Air Quality Management District									
	ROG	NO_X	CO	PM10			PM2.5			SO_2	ROG	NO_X	CO	PM10			PM2.5			SO_2
Year				Exhaust	Dust	Total	Exhaust	Dust	Total					Exhaust	Dust	Total	Exhaust	Dust	Total	
2016	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2017	<1	6	3	1	4	4	1	1	2	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
2018	25	287	180	4	224	227	4	52	55	6	1	5	6	<1	5	5	<1	1	1	<1
2019	175	1,424	1,135	18	518	536	17	100	117	10	7	49	47	1	21	22	1	3	4	<1
2020	50	560	296	7	262	268	6	58	65	7	4	38	26	1	11	12	1	2	3	<1
2021	55	587	324	7	260	266	7	58	64	6	5	39	27	1	10	11	1	2	2	<1
2022	55	648	316	7	368	372	6	82	87	5	3	27	17	<1	11	11	<1	2	2	<1
2023	75	679	489	7	383	386	7	84	90	5	5	47	36	<1	26	26	<1	5	5	<1
2024	81	717	511	6	300	306	6	60	66	4	5	44	32	<1	30	30	<1	6	6	<1
2025	11	209	65	1	181	182	1	44	44	2	1	12	4	<1	16	16	<1	3	3	<1
2026	11	209	66	1	181	182	1	44	44	2	1	13	4	<1	16	16	<1	3	3	<1
2027	11	208	66	1	181	182	1	44	44	2	1	11	4	<1	18	18	<1	4	4	<1
2028	11	208	66	1	181	182	1	44	44	2	0	3	1	<1	5	5	<1	1	1	<1
2029	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Thresholds	*54*	*54*	-	*82*	*BMPs*	-	*54*	*BMPs*	-	-	-	-	-	-	-	-	-	-	-	-
	Sacramento Metropolitan Air Quality Management District										Sacramento Metropolitan Air Quality Management District									
	ROG	NO_X	CO	PM10			PM2.5			SO_2	ROG	NO_X	CO	PM10			PM2.5			SO_2
Year				Exhaust	Dust	Total	Exhaust	Dust	Total					Exhaust	Dust	Total	Exhaust	Dust	Total	
2016	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2017	<1	4	3	1	1	2	1	<1	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	0
2018	1	8	6	2	31	33	2	5	7	0	0	0	0	0	3	3	0	0	1	0
2019	128	860	848	12	266	278	12	40	52	4	4	24	29	1	14	15	1	2	3	0
2020	<1	2	1	<1	29	29	<1	4	4	<1	<1	<1	<1	<1	2	2	<1	<1	<1	<1
2021	0	0	0	0	29	29	0	4	4	0	0	0	0	0	2	2	0	<1	<1	0
2022	160	1,285	1,124	15	465	480	15	60	74	11	9	70	65	1	48	49	1	6	7	<1
2023	437	3,557	2,979	49	1,088	1,128	47	139	177	37	39	311	269	4	103	107	4	13	17	2
2024	568	4,588	3,748	65	1,427	1,492	63	183	245	35	49	382	327	5	135	140	5	18	23	3
2025	517	4,980	3,669	59	1,786	1,844	57	223	279	35	25	195	181	3	89	92	3	12	15	1
2026	290	1,664	1,549	22	606	628	22	92	113	24	24	160	161	2	75	77	2	11	13	1
2027	242	1,876	1,662	26	698	724	26	103	129	38	24	177	161	2	83	85	2	12	14	1
2028	184	1,007	827	11	442	453	10	60	70	4	6	42	34	<1	25	25	<1	3	4	<1
2029	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Thresholds	-	*85*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Year	San Joaquin Valley Air Pollution Control District										San Joaquin Valley Air Pollution Control District									
	ROG	NO_X	CO	PM10			PM2.5			SO_2	ROG	NO_X	CO	PM10			PM2.5			SO_2
				Exhaust	Dust	Total	Exhaust	Dust	Total					Exhaust	Dust	Total	Exhaust	Dust	Total	
2016	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2017	<1	2	2	1	1	1	1	<1	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
2018	24	336	177	4	159	162	4	36	39	5	1	6	5	<1	5	5	<1	1	1	<1
2019	36	534	219	6	196	202	6	44	49	5	2	18	12	<1	8	8	<1	1	2	<1
2020	37	505	216	5	184	189	4	40	45	5	3	25	17	<1	8	9	<1	1	2	<1
2021	41	529	243	5	184	189	5	40	45	5	3	25	17	<1	7	8	<1	1	2	<1
2022	51	613	356	5	250	254	5	47	51	3	2	16	12	<1	7	7	<1	1	1	<1
2023	134	1,001	899	13	309	320	13	57	68	4	9	69	65	1	25	25	1	4	5	<1
2024	154	1,199	1,007	11	327	338	11	48	59	4	9	61	58	1	28	29	1	4	5	<1
2025	36	262	189	3	116	119	3	22	24	1	1	8	8	<1	11	11	<1	2	2	<1
2026	33	240	172	2	115	116	2	21	23	1	1	5	5	<1	10	10	<1	1	2	<1
2027	31	226	167	2	108	109	2	20	22	1	1	8	7	<1	13	14	<1	2	2	<1
2028	31	224	157	2	105	107	2	20	22	1	1	5	4	<1	5	5	<1	1	1	<1
2029	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Thresholds	-	-	-	-	-	-	-	-	-	-	*10*	*10*	-	-	-	*15*	-	-	*15*	-

Operation and maintenance activities under Alternative 9 would result in emissions of ROG, NO_X, CO, PM10, PM2.5, and SO_2. Emissions were quantified for both ELT and LLT conditions, although activities would take place annually until project decommissioning. Future emissions, in general, are anticipated to lessen because of continuing improvements in vehicle and equipment engine technology.

Table 22-142 summarizes criteria pollutant emissions associated with operation of Alternative 9 in the SJVAPCD in pounds per day and tons per year (no operational emissions would be generated in the BAAQMD, SMAQMD, or YSAMQD). Although emissions are presented in different units (pounds and tons), the amounts of emissions are identical (i.e., 2,000 pounds is identical to 1 ton). Summarizing emissions in both pounds per day and tons per year is necessary to evaluate project-level effects against the appropriate air district thresholds, which are given in both pounds and tons (see Table 22-8).

Table 22-142. Criteria Pollutant Emissions from Operation of Alternative 9 (pounds per day and tons per year)

	Maximum Daily Emissions (pounds/day)						Annual Emissions (tons/year)					
	San Joaquin Valley Air Pollution Control District						San Joaquin Valley Air Pollution Control District					
Condition	ROG	NO_X	CO	PM10	PM2.5	SO_2	ROG	NO_X	CO	PM10	PM2.5	SO_2
ELT	1	7	13	2	1	<1	0.06	0.36	0.75	0.12	0.04	<0.01
LLT	1	6	13	2	1	<1	0.05	0.31	0.71	0.11	0.03	<0.01
Thresholds	-	-	-	-	-	-	*10*	*10*	-	*15*	*15*	-

Impact AQ-1: Generation of Criteria Pollutants in Excess of the SMAQMD Regional Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: As shown in Table 22-141, construction emissions would exceed SMAQMD's daily NO_X threshold in 2019 and for all years between 2022 and 2028, even with implementation of environmental commitments. Since NO_X is a precursor to ozone and PM, exceedances of SMAQMD's daily NO_X threshold could impact both regional ozone and PM formation, which could worsen regional air quality and air basin attainment of the NAAQS and CAAQS.

While equipment could operate at any work area identified for this alternative, the highest level of NO_X emissions in the SMAQMD is expected to occur at those sites where the duration and intensity of construction activities would be greatest.

Environmental commitments will reduce construction-related emissions; however, as shown in Table 22-141, NO_X emissions would still exceed SMAQMD's threshold identified in Table 22-8 and would result in an adverse effect to air quality. Mitigation Measures AQ-1a and AQ-1b would be available to reduce NO_X emissions, and would thus address regional effects related to secondary ozone and PM formation

***CEQA Conclusion*:** NO_X emissions generated during construction would exceed SMAQMD threshold identified in Table 22-8. Since NO_X is a precursor to ozone and PM, exceedances of SMAQMD's daily NO_X threshold could impact both regional ozone and PM formation. SMAQMD's regional emissions thresholds (Table 22-8) and PM10 screening criteria have been adopted to ensure projects do not hinder attainment of the CAAQS or NAAQS. The impact of generating NO_X emissions in excess of local air district thresholds would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. This would be a significant impact. Mitigation Measures AQ-1a and AQ-1b would be available to reduce NO_X emissions to a less-than-significant level by offsetting emissions to quantities below SMAQMD CEQA thresholds (see Table 22-8).

Mitigation Measure AQ-1a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-1a under Impact AQ-1 in the discussion of Alternative 1A.

Mitigation Measure AQ-1b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-1b under Impact AQ-1 in the discussion of Alternative 1A.

Impact AQ-2: Generation of Criteria Pollutants in Excess of the YSAQMD Regional Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: Construction of Alternative 9 would occur in the SMAQMD, SJVAPCD, and BAAQMD. No construction emissions would be generated in the YSAQMD. Consequently, construction of Alternative 9 would neither exceed the YSAQMD regional thresholds of significance nor result in an adverse effect to air quality.

***CEQA Conclusion*:** Alternative 9 would require any construction in the YSAQMD and no emissions would be generated. Consequently, construction of Alternative 9 would not contribute to or worsen existing air quality conditions in the YSAQMD. This impact would be less than significant. No mitigation is required.

Impact AQ-3: Generation of Criteria Pollutants in Excess of the BAAQMD Regional Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: As shown in Table 22-141, construction emissions would exceed BAAQMD's daily thresholds for the following pollutants and years, even with implementation of environmental commitments.

- ROG: 2019 and 2021–2024
- NO_X: 2018–2028

Since ROG and NO_X are precursors to ozone and NO_X is a precursor to PM, exceedances of BAAQMD's ROG and NO_X thresholds could impact both regional ozone and PM formation, which could worsen regional air quality and air basin attainment of the NAAQS and CAAQS.

Environmental commitments outlined in Appendix 3B, *Environmental Commitments,* will reduce construction-related emissions; however, as shown in Table 22-141, ROG and NO_X emissions would still exceed BAAQMD's thresholds identified in Table 22-8 and would result in an adverse effect to air quality. Mitigation Measures AQ-3a and AQ-3b are available to reduce ROG and NO_X emissions, and would thus address regional effects related to secondary ozone and PM formation.

***CEQA Conclusion*:** Emissions of ROG and NO_X generated during construction would exceed BAAQMD thresholds identified in Table 22-8. Since ROG and NO_X are precursors to ozone and NO_X is a precursor to PM, exceedances of BAAQMD's ROG and NO_X thresholds could impact both regional ozone and PM formation. BAAQMD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS or NAAQS. The impact of generating emissions in excess of local air district thresholds would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. This would be a significant impact. Mitigation Measures AQ-3a and AQ-3b would be available to reduce ROG and NO_X emissions to a less-than-significant level.

Mitigation Measure AQ-3a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within BAAQMD/SFBAAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable BAAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-3a under Impact AQ-3 in the discussion of Alternative 1A.

Mitigation Measure AQ-3b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the BAAQMD/SFBAAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable BAAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-3b under Impact AQ-3 in the discussion of Alternative 1A.

Impact AQ-4: Generation of Criteria Pollutants in Excess of the SJVAPCD Regional Thresholds during Construction of the Proposed Water Conveyance Facility

NEPA Effects: As shown in Table 22-141, construction emissions would exceed SJVAPCD's thresholds for the following pollutants and years, even with implementation of environmental commitments. The annual ROG threshold would also be exceed in 2015. All other pollutants would be below air district thresholds and therefore would not result in an adverse air quality effect.

- NO_X: 2019–2024
- PM10: 2023–2024

Since NO_X is a precursor to ozone and PM, exceedances of SJVAPCD's NO_X thresholds could impact both regional ozone and PM formation, which could worsen regional air quality and air basin attainment of the NAAQS and CAAQS. Similarly, exceedances of SJVAPCD's PM10 threshold could impede attainment of the NAAQS and CAAQS for PM10.

Environmental commitments outlined in Appendix 3B, *Environmental Commitments,* will reduce construction-related emissions; however, as shown in Table 22-141, NO_X and PM10 emissions would still exceed SJVAPCD's thresholds identified in Table 22-8 and would result in an adverse effect to air quality. Mitigation Measures AQ-4a and AQ-4b are available to reduce NO_X and PM10 emissions, and would thus address regional effects related to secondary ozone and PM formation.

CEQA Conclusion: Emissions of NO_X and PM10 generated during construction would exceed SJVAPCD's regional significance threshold identified in Table 22-8. Since NO_X is a precursor to ozone and PM, exceedances of SJVAPCD's NO_X thresholds could impact both regional ozone and PM formation, which could worsen regional air quality and air basin attainment of the NAAQS and CAAQS. Similarly, exceedances of SJVAPCD's PM10 threshold could impede attainment of the NAAQS and CAAQS for PM10. SJVAPCD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS or NAAQS. The impact of generating NO_X and PM10 emissions in excess of local air district thresholds would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. This would be a significant impact. Mitigation Measures AQ-4a and AQ-4b would reduce this impact to less-than-significant levels.

Mitigation Measure AQ-4a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4a under Impact AQ-4 in the discussion of Alternative 1A.

Mitigation Measure AQ-4b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4b under Impact AQ-4 in the discussion of Alternative 1A.

Impact AQ-5: Generation of Criteria Pollutants in Excess of the SMAQMD Regional Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Alternative 9 would not construct any permanent features in the SMAQMD that would require routine operations and maintenance activities. No operational emissions would be generated in the SMAQMD. Consequently, operation of Alternative 9 would neither exceed the SMAQMD regional thresholds of significance nor result in an adverse effect to air quality.

CEQA Conclusion: Alternative 9 would not construct any permanent features in the SMAQMD that would require routine operations and maintenance. No operational emissions would be generated in the SMAQMD. Consequently, operation of Alternative 9 would not contribute to or worsen existing air quality conditions in the SMAQMD. This impact would be less than significant. No mitigation is required.

Impact AQ-6: Generation of Criteria Pollutants in Excess of the YSAQMD Regional Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Alternative 9 would not construct any permanent features in the YSAQMD that would require routine operations and maintenance. No operational emissions would be generated in the YSAQMD. Consequently, operation of Alternative 9 would neither exceed the YSAQMD regional thresholds of significance nor result in an adverse effect on air quality.

***CEQA Conclusion*:** Alternative 9 would not construct any permanent features in the YSAQMD that would require routine operations and maintenance. No operational emissions would be generated in the YSAQMD. Consequently, operation of Alternative 9 would not contribute to or worsen existing air quality conditions in the YSAQMD. This impact would be less than significant. No mitigation is required.

Impact AQ-7: Generation of Criteria Pollutants in Excess of the BAAQMD Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Alternative 9 would not construct any permanent features in the BAAQMD that would require routine operations and maintenance. No operational emissions would be BAAQMD in the BAAQMD. Consequently, operation of Alternative 9 would neither exceed the BAAQMD regional thresholds of significance nor result in an adverse effect to air quality.

***CEQA Conclusion*:** Alternative 9 would not construct any permanent features in the BAAQMD that would require routine operations and maintenance. No operational emissions would be generated in the BAAQMD. Consequently, operation of Alternative 9 would not contribute to or worsen existing air quality conditions in the BAAQMD. This impact would be less than significant. No mitigation is required.

Impact AQ-8: Generation of Criteria Pollutants in Excess of the SJVAPCD Thresholds from Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: Operations and maintenance include both routine activities and major inspections. Daily The highest concentration of operational emissions in the SJVAPCD is expected at the fish screen and operable barrier locations. As shown in Table 22-142, operation and maintenance activities under Alternative 9 would not exceed SJVAPCD's regional thresholds of significance and there would be no adverse effect (see Table 22-8). Accordingly, project operations would not contribute to or worsen existing air quality exceedances. There would be no adverse effect.

***CEQA Conclusion*:** Emissions generated during operation and maintenance activities would not exceed SJVAPCD regional thresholds for criteria pollutants. SJVAPCD's regional emissions thresholds (Table 22-8) have been adopted to ensure projects do not hinder attainment of the CAAQS. The impact of generating emissions in excess of local air district would therefore violate applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Because project operations would not exceed SJVAPCD regional thresholds, the impact would be less than significant.

Impact AQ-9: Exposure of Sensitive Receptors to Health Hazards from Localized Particulate Matter in Excess of SMAQMD's Health-Based Concentration Thresholds

NEPA Effects: As shown in Table 22-141, construction would increase PM10 and PM2.5 emissions in SMAQMD, which may pose inhalation-related health risks for receptors exposed to certain concentrations.

PM2.5 and PM10 concentrations at sensitive receptors locations were assessed using the EPA's AERMOD dispersion. The methodology described in Section 22.3.1.3 provides a more detailed summary of the approach used to conduct the analysis. Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, provides an in-depth discussion of the methodology and results.

Table 22-143 shows the highest predicted annual and daily (24-hour) PM10 and PM2.5 concentrations in SMAQMD. Exceedances from air district thresholds are shown in underline.

Table 22-143. Alternative 9 PM10 and PM2.5 Concentration Results in SMAQMD

	PM10		PM2.5	
Parameter	Annual (μg/m³)	24-Hour (μg/m³)	Annual (μg/m³)	24-Hour (μg/m³)
Maximum Value	2.9	131	0.45	21
SMAQMD Threshold	*1*	*2.5*	*0.6*	-

Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions,* includes modeling results for all receptors.
μg/m³ = micrograms per cubic meter

As shown in Table 22-143, all estimated annual PM2.5 concentrations would be less than SMAQMD's annual thresholds. However, both the annual and maximum predicted 24-hour PM10 threshold exceeds SMAQMD's thresholds. Exceedances of the annual threshold would occur at 17 receptor locations near the intake work areas, while exceedances of the 24-hour threshold would occur at 435 receptor locations near intakes. The 24-hour exceedances would be temporary and occur intermittently due to equipment use, soil disturbance, and meteorological conditions.

As discussed above, DWR has identified several environmental commitments to reduce construction-related particulate matter in the SMAQMD (see Appendix 3B, *Environmental Commitments*). While these commitments will reduce localized particulate matter emissions, concentrations at the analyzed receptor locations would still exceed SMAQMD's PM10 thresholds. The receptors exposed to PM10 concentrations in excess of SMAQMD's threshold could experience increased risk for adverse human health effects. Mitigation Measure AQ-9 is available to address this effect.

CEQA Conclusion: Respirable particulates pose human health hazard by bypassing the defenses within the mucous ciliary system and entering deep lung tissue. Construction of Alternative 9 would result in PM10 concentrations at receptor locations that are above the significance thresholds established by the SMAQMD. As such, localized particulate matter concentrations at analyzed receptors would result in significant human health impacts. Mitigation Measure AQ-9 outlines a tiered strategy to reduce PM10 concentrations and public exposure to a less-than-significant level.

Mitigation Measure AQ-9: Implement Measures to Reduce Re-Entrained Road Dust and Receptor Exposure to PM2.5 and PM10

Please see Mitigation Measure AQ-9 under Impact AQ-9 in the discussion of Alternative 1A.

Impact AQ-10: Exposure of Sensitive Receptors to Health Hazards from Localized Particulate Matter in Excess of YSAQMD's Health-Based Concentration Thresholds

NEPA Effects: Construction of Alternative 9 would occur in the SMAQMD, SJVAPCD, and BAAQMD. No construction emissions would be generated in the YSAQMD. Consequently, Alternative 9 would not expose receptors to increased health risks from localized particulate matter since there would be no emissions. There would be no adverse effect.

CEQA Conclusion: Construction of Alternative 9 would occur in the SMAQMD, SJVAPCD, and BAAQMD. No construction emissions would be generated in the YSAQMD. Consequently, Alternative 1C would not expose receptors to increased health risks from localized particulate matter since there would be no emissions. This impact would be less than significant. No mitigation is required.

Impact AQ-11: Exposure of Sensitive Receptors to Health Hazards from Localized Particulate Matter in Excess of BAAQMD's Health-Based Concentration Thresholds

NEPA Effects: As shown in Table 22-141, construction would increase PM10 and PM2.5 emissions in BAAQMD, which may pose inhalation-related health risks for receptors exposed to certain concentrations.

PM2.5 and PM10 concentrations at sensitive receptors locations were assessed using the EPA's AERMOD dispersion. The methodology described in Section 22.3.1.3 provides a more detailed summary of the approach used to conduct the analysis. Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, provides an in-depth discussion of the methodology and results.

As shown in Table 22-144, maximum predicted PM2.5 concentrations are less than BAAQMD's adopted threshold. The project would also implement all air district recommended onsite fugitive dust controls, such as regular watering. Accordingly, this alternative's effect of exposure of sensitive receptors to localized particulate matter concentrations would not be adverse.

Table 22-144. Alternative 9 PM10 and PM2.5 Concentration Results in BAAQMD

	PM10		PM2.5	
Parameter	Annual (μg/m^3)	24-Hour (μg/m^3)	Annual (μg/m^3)	24-Hour (μg/m^3)
Maximum Value	0.2	18	0.05	4.00
BAAQMD Threshold	-	-	*0.3*	-

Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions,* includes modeling results for all receptors.
μg/m^3 = micrograms per cubic meter

CEQA Conclusion: Respirable particulates pose human health hazard by bypassing the defenses within the mucous ciliary system and entering deep lung tissue. Construction of Alternative 9 would result in PM2.5 and PM10 concentrations at receptor locations that are below the significance thresholds established by the BAAQMD. As such, localized particulate matter concentrations at analyzed receptors would not result in significant human health impacts. No mitigation is required.

Impact AQ-12: Exposure of Sensitive Receptors to Health Hazards from Localized Particulate Matter in Excess of SJVAPCD's Health-Based Concentration Thresholds

NEPA Effects: As shown in Table 22-141, construction would increase PM10 and PM2.5 emissions in SJVAPCD, which may pose inhalation-related health risks for receptors exposed to certain concentrations.

PM2.5 and PM10 concentrations at sensitive receptors locations were assessed using the EPA's AERMOD dispersion. The methodology described in Section 22.3.1.3 provides a more detailed summary of the approach used to conduct the analysis. Appendix 22C, *Bay Delta Conservation Plan*

Air Dispersion Modeling and Health Risk Assessment for Construction Emissions, provides an in-depth discussion of the methodology and results.

As shown in Table 22-145, maximum predicted annual PM2.5 concentrations and annual PM10 concentrations are less than SJVAPCD's adopted thresholds. However, the maximum predicted 24-hour PM2.5 and PM10 concentrations would exceed the SJVAPCD's threshold. Exceedances of the PM2.5 24-hour threshold would occur at six receptor locations. The exceedances of the PM10 24-hour threshold would occur at 24 locations. The 24-hour exceedances would be temporary and occur intermittently due to equipment use, soil disturbance, and meteorological conditions.

As discussed above, DWR has identified several environmental commitments to reduce construction-related particulate matter in the SJVAPCD (see Appendix 3B, *Environmental Commitments*). While these commitments will reduce localized particulate matter emissions, concentrations at the receptor locations would still exceed SJVAPCD's 24-hour PM2.5 and PM10 threshold. The receptors exposed to PM2.5 and PM10 concentrations in excess of SJVAPCD's threshold could experience increased risk for adverse human health effects. Mitigation Measure AQ-9 is available to address this effect.

Table 22-145. Alternative 9 PM10 and PM2.5 Concentration Results in SJVAPCD

	PM10		PM2.5	
Parameter	Annual (μg/m³)	24-Hour (μg/m³)	Annual (μg/m³)	24-Hour (μg/m³)
Maximum Value	0.11	25.8	0.02	18.3
SJVAPCD Threshold	*2.08*	*10.4*	*2.08*	*10.4*

Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions,* includes modeling results for all receptors.
μg/m³ = micrograms per cubic meter

CEQA Conclusion: Respirable particulates pose human health hazard by bypassing the defenses within the mucous ciliary system and entering deep lung tissue. Construction of Alternative 9 would result in PM2.5 and PM10 concentrations at six and 24 receptor locations, respectively, that are above the significance thresholds established by the SJVAPCD. As such, localized particulate matter concentrations at analyzed receptors would result in significant human health impacts. Mitigation Measure AQ-9 outlines a tiered strategy to reduce PM2.5 and PM10 concentrations and public exposure to a less-than-significant level.

Mitigation Measure AQ-9: Implement Measures to Reduce Re-Entrained Road Dust and Receptor Exposure to PM2.5 and PM10

Please see Mitigation Measure AQ-9 under Impact AQ-9 in the discussion of Alternative 1A.

Impact AQ-13: Exposure of Sensitive Receptors to Health Hazards from Localized Carbon Monoxide

NEPA Effects: Continuous engine exhaust may elevate localized CO concentrations. Receptors exposed to these CO "hot-spots" may have a greater likelihood of developing adverse health effects (as described in Section 22.1.2). CO hot-spots are typically observed at heavily congested intersections where a substantial number of gasoline-powered vehicles idle for prolonged durations throughout the day. Construction sites are less likely to result in localized CO hot-spots due to the nature of construction activities (Sacramento Metropolitan Air Quality Management District 2014), which normally utilize diesel-powered equipment for intermittent or short durations. Moreover, construction sites must comply with the Occupational Safety and Health Administration's (OSHA) CO exposure standards for onsite workers. Unlike regional pollutants (e.g., ROG and NO_X), CO concentrations also dissipate as a function of distance and will therefore be lower at offsite receptor locations. Accordingly, given that construction activities typically do not result in CO hot-spots, onsite concentrations must comply with OSHA standards, and CO levels dissipate as a function of distance, equipment-generated CO emissions (see Table 22-141) are not anticipated to result in adverse health hazards to sensitive receptors.

Construction traffic may contribute to increased roadway congestion, which could lead to conditions conducive to CO hot-spot formation. As shown in Table 19-32, the highest peak hour traffic volumes under BPBGPP—10,657 vehicles per hour—on westbound Interstate 80 between Suisun Valley Road and State Route 12. This is about half of the congested traffic volume modeled by BAAQMD (24,000 vehicles per hour) that would be needed to contribute to a localized CO hot-spot, and less than half of the traffic volume modeled by SMAQMD (31,600 vehicles per hour). The BAAQMD's and SMAQMD's CO screening criteria were developed based on County average vehicle fleets that are primarily comprised of gasoline vehicles. Construction vehicles would be predominantly diesel trucks, which generate fewer CO emissions per idle-hour and vehicle mile traveled than gasoline-powered vehicles. Accordingly, the air district screening thresholds provide a conservative evaluation threshold for the assessment of potential CO emissions impacts during construction.

Based on the above analysis, even if all vehicles on the modeled traffic segment drove through the same intersection in the peak hour, CO concentrations adjacent to the traveled way would not exceed the CAAQS or NAAQS according to BAAQMD's and SMAQMD's screening criteria. Thus, construction traffic is not anticipated to result in adverse health hazards to sensitive receptors.

***CEQA Conclusion*:** Continuous engine exhaust may elevate localized CO concentrations. Receptors exposed to these CO "hot-spots" may have a greater likelihood of developing adverse health effects. Construction sites are less likely to result in localized CO hot-spots due to the nature of construction activities (Sacramento Metropolitan Air Quality Management District 2014), which normally utilize diesel-powered equipment for intermittent or short durations. Moreover, construction sites must comply with the OSHA CO exposure standards for onsite workers. Accordingly, given that construction activities typically do not result in CO hot-spots, onsite concentrations must comply with OSHA standards, and CO levels dissipate as a function of distance, equipment-generated CO emissions are not anticipated to result in significant health hazards to sensitive receptors. Similarly, peak-hour construction traffic on local roadways would not exceed BAAQMD's or SMAQMD's conservative screening criteria for the formation potential CO hot-spots. This impact would be less than significant. No mitigation is required.

Impact AQ-14: Exposure of Sensitive Receptors to Health Hazards from Diesel Particulate Matter in Excess of SMAQMD's Chronic Non-Cancer and Cancer Risk Thresholds

NEPA Effects: As shown in Table 22-141, construction of Alternative 9 would increase DPM emissions in SMAQMD, particularly near sites involving the greatest duration and intensity of construction activities. DPM poses inhalation-related chronic non-cancer hazard and cancer risks if adjacent receptors are exposed to significant DPM concentrations for prolonged durations.

Receptor exposure to construction DPM emissions was assessed by predicting the health risks in terms of excess cancer and non-cancer hazard impacts using the EPA's AERMOD dispersion modeling and guidance published by OEHHA. Based on HRA results detailed in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, Alternative 9 would not exceed the SMAQMD's thresholds for chronic non-cancer hazard; however, it would exceed SMAQMD's cancer risk threshold (see Table 22-146). A total of 52 sensitive receptor locations were found to exceed the cancer risk threshold of 10 per million.

As discussed above, DWR has identified several environmental commitments to reduce construction-related diesel particulate matter in the SMAQMD (see Appendix 3B, *Environmental Commitments*). While these commitments will reduce localized diesel particulate matter emissions, cancer risk levels were found to exceed the significance threshold at some of the analyzed receptors and those locations could experience increased risk for adverse human health effects.

Mitigation Measure AQ-16 would be available to reduce exposure to substantial cancer risk by relocating affected receptors. Although Mitigation Measure AQ-16 would reduce the severity of this effect, the BDCP proponents are not solely responsible for implementation of the measure. If a landowner chooses not to accept DWR's offer of relocation assistance, an adverse effect in the form excess cancer risk above air district thresholds would occur. Therefore, this effect would be adverse. If, however, all landowners accept DWR's offer of relocation assistance, effects would not be adverse.

CEQA Conclusion: DPM generated during construction poses inhalation-related chronic non-cancer hazard and cancer risk if adjacent receptors are exposed to significant concentrations for prolonged durations. DPM generated during Alternative 9 construction would not exceed the SMAQMD's chronic non-cancer hazard threshold. However, a total of 52 sensitive receptor locations would be exposed to substantial pollutant concentrations. Therefore, this impact for DPM emissions would be significant.

Mitigation Measure AQ-16 would be available to reduce exposure to substantial cancer risk by relocating affected receptors. Although Mitigation Measure AQ-16 would reduce the severity of this effect, the BDCP proponents are not solely responsible for implementation of the measure. If a landowner chooses not to accept DWR's offer of relocation assistance, a significant impact in the form excess cancer risk above air district thresholds would occur. Therefore, this effect would be significant and unavoidable. If, however, all landowners accept DWR's offer of relocation assistance, the impact would be less than significant.

Mitigation Measure AQ-16: Relocate Sensitive Receptors to Avoid Excess Cancer Risk

Please see Mitigation Measure AQ-16 under Impact AQ-16 in the discussion of Alternative 1A.

Table 22-146. Alternative 9 Health Hazards in the Sacramento Metropolitan Air Quality Management District

Parameter	Chronic Health Hazard	Cancer Health Risk
Maximum Value at MEI	0.019	57 per million
Thresholds	1	10 per million

Source: Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*.
MEI = maximally exposed individual.

Impact AQ-15: Exposure of Sensitive Receptors to Health Hazards from Diesel Particulate Matter in Excess of YSAQMD's Chronic Non-Cancer and Cancer Risk Thresholds

NEPA Effects: Construction of Alternative 9 would occur in the SMAQMD, SJVAPCD, and BAAQMD. No construction emissions would be generated in the YSAQMD. Consequently, Alternative 9 would not expose receptors to increased health risks from DPM since there would be no emissions. There would be no adverse effect.

***CEQA Conclusion*:** Construction of Alternative 9 would occur in the SMAQMD, SJVAPCD, and BAAQMD. No construction emissions would be generated in the YSAQMD. Consequently, Alternative 1C would not expose receptors to increased health risks from DPM since there would be no emissions. This impact would be less than significant. No mitigation is required.

Impact AQ-16: Exposure of Sensitive Receptors to Health Hazards from Diesel Particulate Matter in Excess of BAAQMD's Chronic Non-Cancer and Cancer Risk Thresholds

NEPA Effects: As shown in Table 22-141, construction would increase DPM emissions in the BAAQMD, particularly near sites involving the greatest duration and intensity of construction activities. DPM poses inhalation-related chronic non-cancer hazard and cancer risks if adjacent receptors are exposed to significant DPM concentrations for prolonged durations.

Receptor exposure to construction DPM emissions was assessed by predicting the health risks in terms of excess cancer and non-cancer hazard impacts using the EPA's AERMOD dispersion modeling and guidance published by OEHHA. Based on the HRA results detailed in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, Alternative 9 would not exceed the BAAQMD's chronic non-cancer hazard or cancer risk thresholds (see Table 22-147). Therefore, this alternative's effect of exposure of sensitive receptors to health hazards during construction would not be adverse.

***CEQA Conclusion*:** DPM generated during construction poses inhalation-related chronic non-cancer hazard and cancer risk if adjacent receptors are exposed to significant concentrations for prolonged durations. The DPM generated during Alternative 9 construction would not exceed the BAAQMD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this impact for DPM health hazards would be less than significant. No mitigation is required.

Table 22-147. Alternative 9 Health Hazards from DPM Exposure in the Bay Area Air Quality Management District

Parameter	Chronic Health Hazard	Cancer Health Risk
Maximum Value at MEI	0.003	8 per million
BAAQMD Thresholds	1	10 per million

Source: Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*.
MEI = maximally exposed individual.

Impact AQ-17: Exposure of Sensitive Receptors to Health Hazards from Diesel Particulate Matter in Excess of SJVAPCD's Chronic Non-Cancer and Cancer Risk Thresholds

NEPA Effects: As shown in Table 22-141, construction would increase DPM emissions in the SJVAPCD, particularly near sites involving the greatest duration and intensity of construction activities. DPM poses inhalation-related chronic non-cancer hazard and cancer risks if adjacent receptors are exposed to significant DPM concentrations for prolonged durations.

Receptor exposure to construction DPM emissions was assessed by predicting the health risks in terms of excess cancer and non-cancer hazard impacts using the EPA's AERMOD dispersion modeling and guidance published by OEHHA. Based on HRA results detailed in Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*, Alternative 9 would not exceed the SJVAPCD's chronic non-cancer or cancer risk thresholds (Table 22-148) and, thus, would not expose sensitive receptors to substantial risk from pollutant concentrations. Therefore, this alternative's effect of exposure of sensitive receptors to DPM emissions and their health hazards during construction would not be adverse.

***CEQA Conclusion*:** DPM generated during construction poses inhalation-related chronic non-cancer hazard and cancer risk if adjacent receptors are exposed to significant concentrations for prolonged durations. The DPM generated during Alternative 9 construction would not exceed the SJVAPCD's chronic non-cancer or cancer thresholds, and thus would not expose sensitive receptors to substantial pollutant concentrations. Therefore, this impact for DPM health hazards would be less than significant. No mitigation is required.

Table 22-148. Alternative 9 Health Hazards in the San Joaquin Valley Air Pollution Control District

Alternative 9	Chronic Health Hazard	Cancer Health Risk
Maximum Value at MEI	0.003	11 per million
BAAQMD Thresholds	1	10 per million

Source: Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*.
MEI = maximally exposed individual.

Parameter	Chronic Health Hazard	Cancer Health Risk
Maximum Value at MEI	0.001	4 per million
SJVAPCD Thresholds	1	10 per million

Source: Appendix 22C, *Bay Delta Conservation Plan Air Dispersion Modeling and Health Risk Assessment for Construction Emissions*.
MEI = maximally exposed individual.

Impact AQ-18: Exposure of Sensitive Receptors to *Coccidioides immitis* (Valley Fever)

***NEPA Effects*:** As discussed under Alternative 1A, earthmoving activities during construction could release *C. immitis* spores if filaments are present and other soil chemistry and climatic conditions are conducive to spore development. Receptors adjacent to the construction area may therefore be exposed to increase risk of inhaling *C. immitis* spores and subsequent development of Valley Fever. Dust-control measures are the primary defense against infection (United States Geological Survey 2000). Implementation of advanced air-district recommended fugitive dust controls outlined in

Appendix 3B, *Environmental Commitments*, would avoid dusty conditions and reduce the risk of contracting Valley Fever through routine watering and other controls. Therefore, this alternative's effect of exposure of sensitive receptors to increased Valley Fever risk during construction would not be adverse.

***CEQA Conclusion*:** Construction of the water conveyance facility would involve earthmoving activities that could release *C. immitis* spores if filaments are present and other soil chemistry and climatic conditions are conducive to spore development. Receptors adjacent to the construction area may therefore be exposed to increase risk of inhaling *C. immitis* spores and subsequent development of Valley Fever. Implementation of air-district recommended fugitive dust controls outlined in Appendix 3B, *Environmental Commitments*, would avoid dusty conditions and reduce the risk of contracting Valley Fever through routine watering and other controls. Therefore, this impact would be less than significant. No mitigation is required.

Impact AQ-19: Creation of Potential Odors Affecting a Substantial Number of People during Construction or Operation of the Proposed Water Conveyance Facility

NEPA Effects: As discussed under Alternative 1A, odors from construction activities would be localized and generally confined to the immediate area surrounding the construction site. Moreover, odors would be temporary and localized, and they would cease once construction activities have been completed. Thus, it is not anticipated that construction of CM1 would create objectionable odors from construction equipment or asphalt paving.

Construction of the water conveyance facility would require removal of subsurface material during tunnel excavation and sediment removal. As discussed under Alternative 1A, geotechnical tests indicate that VOC levels in Plan Area soils are below the method detection limits, indicating that organic decay of exposed RTM and sediment will be relatively low (URS 2014). Moreover, drying and stockpiling of the removed RTM and sediment will occur under aerobic conditions, which will further limit any potential decomposition and associated malodorous products. Accordingly, it is not anticipated that tunnel and sediment excavation would create objectionable odors.

Typical facilities known to produce odors include landfills, wastewater treatment plants, food processing facilities, and certain agricultural activities. Alternative 9 would not result in the addition of facilities associated with odors, and as such, long-term operation of the water conveyance facility would not result in objectionable odors.

CEQA Conclusion: Alternative 9 would not result in the addition of major odor producing facilities. Diesel emissions during construction could generate temporary odors, but these would quickly dissipate and cease once construction is completed. Likewise, potential odors generated during asphalt paving would be addressed through mandatory compliance with air district rules and regulations. While tunnel excavation would unearth substantial quantities of RTM, geotechnical tests indicate that soils in the Plan Area have relatively low organic constituents. Moreover, drying and stockpiling of the removed RTM will occur under aerobic conditions, which will further limit any potential decomposition and associated malodorous products. Accordingly, the impact of exposure of sensitive receptors to potential odors during construction would be less than significant. No mitigation is required.

Impact AQ-20: Generation of Criteria Pollutants in the Excess of Federal *De Minimis* Thresholds from Construction and Operation and Maintenance of the Proposed Water Conveyance Facility

NEPA Effects: EPA's General Conformity Rule (40 CFR Parts 51 and 93) only applies to Federal actions that are taken in EPA-designated "nonattainment" or "maintenance" areas. Accordingly, as outlined in Section III.A of the General Conformity Rule, "only actions which cause emissions in designated nonattainment and maintenance areas are subject to the regulations". Criteria pollutant emissions resulting from construction and operation of Alternative 9 in the SFNA, SJVAB, and SFBAAB are presented in Table 22-149. Exceedances of the federal *de minimis* thresholds are shown in underlined text.

Sacramento Federal Nonattainment Area

As shown in Table 22-149, implementation of Alternative 9 would exceed the following SFNA federal *de minimis* thresholds:

- ROG: 2023–2025
- NO_X: 2022–2028
- PM10: 2023–2024

ROG and NO_X are precursors to ozone and NO_X is a precursor to PM, for which the SFNA is in nonattainment for the NAAQS. Sacramento County is also a maintenance area for the PM10 NAAQS. Since project emissions exceed the federal *de minimis* thresholds for ROG, NO_X, and PM10, a general conformity determination must be made to demonstrate that total direct and indirect emissions of NO_X, and PM10would conform to the appropriate SFNA ozone SIP for each year of construction in which the *de minimis* thresholds are exceeded.

NO_X is also a precursor to PM and can contribute to PM formation. As discussed above, Sacramento County is currently designated maintenance for the PM10 NAAQS and portions of the SVAB are designated nonattainment for the PM2.5 NAAQS. NO_X emissions in excess of 100 tons per year in Sacramento County trigger a secondary PM10 precursor threshold, whereas NO_X emissions in excess of 100 tons per year in the SVAB trigger a secondary PM2.5 precursor threshold. Since NO_X emissions can contribute to PM formation, NO_X emissions in excess of these secondary precursor thresholds could conflict with the applicable PM10 and PM2.5 SIPs. Accordingly, NO_X offsets pursued for the purposes of general conformity for those years in which NO_X emissions exceed 100 tons must occur within the federally designated PM2.5 nonattainment and PM10 maintenance areas of the SVAB.

As shown in Table 22-141, NO_X emissions generated by construction activities in SMAQMD (Sacramento County) would exceed 100 tons per year between 2023 and 2027. The project therefore triggers the secondary PM10 precursor threshold, requiring all NO_X offsets for 2023 through 2027 to occur within Sacramento County.

Given the magnitude of NO_X emissions and the limited geographic scope available for offsets in 2023 through 2027 (Sacramento County), neither Mitigation Measures AQ-1a nor 1b could feasibly reduce

NO_X emissions to net zero for the purposes of general conformity.[63] This impact would be adverse. In the event that Alternative 9 is selected as the APA, Reclamation, USFWS, and NMFS would need to demonstrate that conformity is met for NO_X and secondary PM10 formation through a local air quality modeling analysis (i.e., dispersion modeling) or other acceptable methods to ensure project emissions do not cause or contribute to any new violations of the NAAQS or increase the frequency or severity of any existing violations.

Mitigation Measure AQ-1a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-1a under Impact AQ-1 in the discussion of Alternative 1A.

Mitigation Measure AQ-1b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-1b under Impact AQ-1 in the discussion of Alternative 1A.

[63] The secondary PM precursor thresholds are triggered through the General Conformity Regulation (40 CFR 93.153 (a)(1)). Accordingly, confinement of the geographic scope for available offsets only applies to the General Conformity determination and does not influence mitigation feasibility for Impacts AQ-1 or AQ-28.

Table 22-149. Criteria Pollutant Emissions from Construction and Operation of Alternative 9 in Nonattainment and Maintenance Areas of the SFNA, SJVAB, and SFBAAB (tons/year)

	Sacramento Federal Nonattainment Area					
Year	ROG	NO_X[a]	CO[b]	PM10[c]	PM2.5	SO_2
2016	0	0	0	0	0	0
2017	<1	<1	<1	<1	<1	<1
2018	<1	<1	<1	3	1	<1
2019	4	24	<1	15	3	<1
2020	<1	<1	<1	2	<1	<1
2021	0	0	0	2	<1	0
2022	9	70	1	49	7	<1
2023	39	311	2	107	17	2
2024	49	382	1	140	23	3
2025	25	195	1	92	15	1
2026	24	160	1	77	13	1
2027	24	177	1	85	14	1
2028	6	42	1	25	4	<1
2029	0	0	0	0	0	0
ELT	0.00	0.00	0.00	0.00	0.00	0.00
LLT	0.00	0.00	0.00	0.00	0.00	0.00
De Minimis	*25*	*25*	*100*	*100*	*100*	*100*

	San Joaquin Valley Air Basin					
Year	ROG	NO_X[a]	CO[b]	PM10	PM2.5	SO_2
2016	0	0	0	0	0	0
2017	0	0	0	0	0	0
2018	1	6	<1	5	1	<1
2019	2	18	<1	8	2	<1
2020	3	25	<1	9	2	<1
2021	3	25	<1	8	2	<1
2022	2	16	<1	7	1	<1
2023	9	69	1	25	5	<1
2024	9	61	1	29	5	<1
2025	1	8	<1	11	2	<1
2026	1	5	<1	10	2	<1
2027	1	8	<1	14	2	<1
2028	1	5	<1	5	1	<1
2029	0	0	0	0	0	0
ELT	0.06	0.36	0.75	0.12	0.04	<0.01
LLT	0.05	0.31	0.71	0.11	0.03	<0.01
De Minimis	*10*	*10*	*100*	*100*	*100*	*100*

Year	San Francisco Bay Area Air Basin					
	ROG	NO_X	CO[b]	PM10[d]	PM2.5	SO_2
2016	0	0	0	-	0	0
2017	<1	<1	<1	-	<1	<1
2018	1	5	0	-	1	<1
2019	7	49	0	-	4	<1
2020	4	38	0	-	3	<1
2021	5	39	0	-	2	<1
2022	3	27	1	-	2	<1
2023	5	47	5	-	5	<1
2024	5	44	5	-	6	<1
2025	1	12	4	-	3	<1
2026	1	13	4	-	3	<1
2027	1	11	4	-	4	<1
2028	<1	3	1	-	1	<1
2029	0	0	0	-	0	0
ELT	0.00	0.00	0.00	-	0.00	0.00
LLT	0.00	0.00	0.00	-	0.00	0.00
De Minimis	*100*	*100*	*100*	-	*100*	*100*

Notes

[a] NO_X emissions in excess of 100 tons per year within federally designated PM10 and PM2.5 nonattainment or maintenance areas trigger a secondary PM10 and PM2.5 precursor threshold. NO_X emissions in excess of this secondary threshold could conflict with the applicable PM10 and PM2.5 SIPs. Accordingly, NO_X offsets pursued for the purposes of general conformity for those years in which NO_X emissions exceed 100 tons must occur within the federally designated PM2.5 nonattainment and PM10 maintenance areas, as applicable.

[b] The proposed water conveyance facility is located within a federally designated CO attainment area. Accordingly, CO emissions generated by construction of CM1 are not subject to the General Conformity Rule and are excluded from the emissions summary and general conformity analysis (40 CFR Part 51 and 93, Section III.A). Emissions presented in the table are limited those generated by haul trucks, which would occur in federally designated CO maintenance area.

[c] There are no federally designated PM10 maintenance areas in Yolo County. Accordingly, PM10 emissions generated by construction of CM1 in Yolo County are not subject to the General Conformity Rule and are excluded from the emissions summary and general conformity analysis for the SFNA (40 CFR Part 51 and 93, Section III.A). Emissions presented in the table are limited those generated within Sacramento County.

[d] There are no federally designated PM10 nonattainment or maintenance areas in the SFBAAB. Accordingly, PM10 emissions generated by construction of CM1 are not subject to the General Conformity Rule and are excluded from the emissions summary and general conformity analysis (40 CFR Part 51 and 93, Section III.A).

San Joaquin Valley Air Basin

As shown in Table 22-149, implementation of Alternative 9 would exceed the following SJVAB federal *de minimis* thresholds:

- NO_X: 2019–2024

NO_X is a precursor to ozone and PM, for which the SJVAB is in nonattainment for the NAAQS. Since project emissions exceed the federal *de minimis* threshold for NO_X, a general conformity determination must be made to demonstrate that total direct and indirect emissions of NO_X would conform to the appropriate SJVAB SIP for each year of construction in which the *de minimis* thresholds are exceeded.

As shown in Appendix 22E, *General Conformity Determination,* Attachment 22E-1, SJVAPCD confirms that sufficient emissions reduction credits would be available to fully offset NO_X emissions in excess of the federal *de minimis* thresholds zero through implementation of Mitigation Measures AQ-4a and 4b. Mitigation Measures AQ-4a and 4b will ensure the requirements of the mitigation and offset program are implemented and conformity requirements for NO_X are met, should Alternative 9 be selected as the APA.

Mitigation Measure AQ-4a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4a under Impact AQ-4 in the discussion of Alternative 1A.

Mitigation Measure AQ-4b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4b under Impact AQ-4 in the discussion of Alternative 1A.

San Francisco Bay Area Air Basin

As shown in Table 22-149, implementation of Alternative 9 would not exceed any of the SFBAAB federal *de minimis* thresholds. Accordingly, a general conformity determination is not required as total direct and indirect emissions would conform to the appropriate SFBAAB SIPs.

CEQA Conclusion: SFNA and SJVAB are classified as nonattainment or maintenance areas with regard to the ozone and PM10 NAAQS, and the impact of increases in criteria pollutant emissions above the air basin *de minimis* thresholds could conflict with or obstruct implementation of the applicable air quality plans. Since construction emissions in the SFNA and SJVAB would exceed the *de minimis* thresholds for ROG (SFNA only), NO_X, and PM10 (SFNA only) this impact would be significant.

Mitigation Measures AQ-4a and AQ-4b would ensure project emissions would not result in an increase in regional NO_X in the SJVAB. These measures would therefore ensure total direct and indirect NO_X emissions generated by the project would conform to the appropriate SJVAB SIPs by offsetting the action's emissions in the same or nearby area to net zero. Accordingly, impacts would be less than significant with mitigation in the SJVAB.

Although Mitigation Measures AQ-1a and AQ-1b would reduce NO_X in the SFNA, given the magnitude of NO_X emissions and the limited geographic scope available for offsets (Sacramento County), neither measure could feasibly reduce NO_X emissions to net zero for the purposes of general conformity. This impact would be significant and unavoidable in the SFNA.

Emissions generated within the SFBAAB would not exceed the SFBAAB de minimis thresholds and would therefore conform to the appropriate SFBAAB SIPs. No mitigation is required.

Impact AQ-21: Generation of Cumulative Greenhouse Gas Emissions during Construction of the Proposed Water Conveyance Facility

NEPA Effects: GHG (CO_2, CH_4, N_2O, SF_6, and HFCs) emissions resulting from construction of Alternative 9 are presented in Table 22-150. Emissions with are presented with implementation of environmental commitments (see Appendix 3B, *Environmental Commitments*) and state mandates to reduce GHG emissions. State mandates include the RPS, LCFS, and Pavley. These mandates do not require additional action on the part of DWR, but will contribute to GHG emissions reductions. For example, Pavley and LCFS will improve the fuel efficiency of vehicles and reduce the carbon content of transportation fuels, respectively. Equipment used to construct the project will therefore be cleaner and less GHG intensive than if the state mandates had not been established.

Table 22-150. GHG Emissions from Construction of Alternative 9 (metric tons/year)[a]

Year	Equipment and Vehicles (CO_2e)	Electricity (CO_2e)	Concrete Batching (CO_2)	Total CO_2e
2016	0	0	528	528
2017	102	0	0	102
2018	4,399	84	65,630	70,113
2019	34,699	472	10,308	45,479
2020	18,107	2,266	64,055	84,427
2021	18,447	6,032	127,047	151,526
2022	39,864	8,470	192,559	240,894
2023	140,547	7,540	188,002	336,089
2024	159,183	7,865	224,928	391,976
2025	75,994	5,306	150,196	231,495
2026	70,085	1,894	35,993	107,972
2027	68,168	362	51,907	120,436
2028	19,539	10	10,212	29,761
2029	0	0	0	0
Total	*649,135*	*40,300*	*1,121,364*	*1,810,799*

[a] Emissions estimates do not account for GHG flux from land disturbance. Surface and subsurface (e.g., tunneling) activities may oxidize peat soils, releasing GHG emissions. However, recent geotechnical surveys indicated that peat is negligible below 80 feet of depth. The tunnel will be placed below this range and the design adjusted if peat soils are discovered. Peat material encountered during surface excavation for non-tunnel work will be covered with top soil to reduce oxidation when needed.

Values may not total correctly due to rounding.

Table 22-151 summarizes GHG emissions that would be generated in in the BAAQMD, SMAQMD, and SJVAPCD (no construction emissions would be generated in the YSAQMD). The table does not include emissions from electricity generation as these emissions would be generated by power plants located throughout the state and the specific location of electricity-generating facilities is unknown (see discussion preceding this impact analysis). Due to the global nature of GHGs, the determination of effects is based on total emissions generated by construction (Table 22-150). GHG emissions presented in Table 22-144 are therefore provided for information purposes only.

Table 22-151. GHG Emissions from Construction of Alternative 9 by Air District (metric tons/year)[a]

Year	Equipment and Vehicles (CO_2e)	Concrete Batching (CO_2)[a]	Total CO_2e[b]
SMAQMD	408,605	373,788	782,393
SJVAPCD	84,245	373,788	458,033
BAAQMD	156,284	373,788	530,073

[a] Emissions assigned to each air district based on the number of batching plants located in that air district.

[b] Values may not total correctly due to rounding.

Construction of Alternative 9 would generate a total of 1.8 million metric tons of GHG emissions after implementation of environmental commitments and state mandates. This is equivalent to adding approximately 381,000 typical passenger vehicles to the road during construction (U.S. Environmental Protection Agency 2014e). As discussed in section 22.3.2, *Determination of Effects*, any increase in emissions above net zero associated with construction of the BDCP water conveyance features would be adverse. Accordingly, this effect would be adverse. Mitigation Measure AQ-21, which would develop a GHG Mitigation Program to reduce construction-related GHG emissions to net zero, is available address this effect.

CEQA Conclusion**:** Construction of Alternative 9 would generate a total of 1.8 million metric tons of GHG emissions. This is equivalent to adding approximately 381,000 typical passenger vehicles to the road during construction (U.S. Environmental Protection Agency 2014e). As discussed in section 22.3.2, *Determination of Effects*, any increase in emissions above net zero associated with construction of the BDCP water conveyance features would be significant. Mitigation Measure AQ-21 would develop a GHG Mitigation Program to reduce construction-related GHG emissions to net zero. Accordingly, this impact would be less-than-significant with implementation of Mitigation Measure AQ-21.

Mitigation Measure AQ-21: Develop and Implement a GHG Mitigation Program to Reduce Construction Related GHG Emissions to Net Zero (0)

Please see Mitigation Measure AQ-21 under Impact AQ-21 in the discussion of Alternative 1A.

Impact AQ-22: Generation of Cumulative Greenhouse Gas Emissions from Operation and Maintenance of the Proposed Water Conveyance Facility and Increased Pumping

NEPA Effects: Operation of Alternative 9 would generate direct and indirect GHG emissions. Sources of direct emissions include heavy-duty equipment, on road crew trucks, and employee vehicle traffic. Indirect emissions would be generated predominantly by electricity consumption required for pumping as well as, maintenance, lighting, and other activities.

Table 22-152 summarizes long-term operational GHG emissions associated with operations, maintenance, and increased SWP pumping. Emissions were quantified for both ELT and LLT conditions, although activities would take place annually until project decommissioning. Emissions include state targets to reduce GHG emissions (described in Impact AQ-21) are presented (there are no BDCP specific operational environmental commitments). Total CO_2e emissions are compared to both the No Action Alternative (NEPA point of comparison) and Existing Conditions (CEQA baseline). As discussed in Section 22.3.1.2, equipment emissions are assumed to be zero under both the No Action Alternative (NEPA point of comparison) and Existing Conditions (CEQA baseline). The equipment emissions presented in Table 22-152 are therefore representative of project impacts for both the NEPA and CEQA analysis. All equipment emissions would be generated in SJVAPCD.

Table 22-152. GHG Emissions from Operation, Maintenance, and Increased SWP Pumping, Alternative 9 (metric tons/year)

Condition	Equipment CO_2e[a]	Electricity CO_{2e} NEPA Point of Comparison	Electricity CO_{2e} CEQA Baseline	Total CO_2e NEPA Point of Comparison	Total CO_2e CEQA Baseline
ELT	144	-	-78,282	-	-78,138
LLT	141	-1,753	-26,143	-1,613	-26,002

Note: The *NEPA point of comparison* compares total CO_2e emissions after implementation of Alternative 9 to the No Action Alternative, whereas the *CEQA baseline* compares total CO_2e emissions to Existing Conditions. Negative values represent a net GHG reduction.

[a] All equipment emissions would occur in SJVAPCD.

SWP Operational and Maintenance GHG Emissions Analysis

Alternative 9 would not add any additional net electricity demand to operation of the SWP and would in fact result in a net reduction in electricity demand. Therefore, there will be no impact on SWP operational emissions. Alternative 9 would not add any permanent facilities that would substantially increase maintenance emissions. There would be no adverse effect.

***CEQA Conclusion*:** Because BDCP Alternative 9 does not add additional electricity or substantial maintenance requirements to the SWP or CVP systems, BDCP Alternative 9 would have a less than significant impact with respect to GHG emissions. No mitigation is required.

Impact AQ-23: Generation of Cumulative Greenhouse Gas Emissions from Increased CVP Pumping as a Result of Implementation of CM1

NEPA Effects: As previously discussed, DWR's CAP cannot be used to evaluate environmental impacts associated with increased CVP pumping, as emissions associated with CVP are not under DWR's control and are not included in the CAP. Accordingly, GHG emissions resulting from increased CVP energy use are evaluated separately from GHG emissions generated as a result of SWP energy use.

Under Alternative 9, operation of the CVP yields the generation of clean, GHG emissions-free, hydroelectric energy. This electricity is sold into the California electricity market or directly to energy users. Analysis of the existing and future no action condition indicates that the CVP generates and will continue to generate all of the electricity needed to operate the CVP system and approximately 3,500 GWh of excess hydroelectric energy that would be sold to energy users throughout California.

Implementation of Alternative 9 is neither expected to require additional electricity over the No Action Alternative nor reduce the amount of excess CVP generation available for sale from the CVP to electricity users. The CVP is operated using energy generated at CVP hydroelectric facilities and therefore results in no GHG emissions. Rather, implementation of Alternative 9 would reduce GHG emissions by 2,290 to 2,946 metric tons of CO_2e, relative to the No Action Alternative (depending on whether the RPS is assumed in the emissions calculations). Accordingly, there would be no adverse effect.

CEQA Conclusion: Implementation of Alternative 9 is neither expected to require additional electricity over Existing Conditions nor reduce the amount of excess CVP generation available for sale from the CVP to electricity users. All power supplied to CVP facilities would continue to be supplied by GHG emissions-free hydroelectricity and there would be no increase in GHG emissions over Existing Conditions as a result of CVP operations. The impact would be less than significant and no mitigation is required.

Impact AQ-25: Generation of Regional Criteria Pollutants from Implementation of CM2–CM11

NEPA Effects: Table 22-29 summarizes potential construction and operational emissions that may be generated by implementation of CM2–CM11. See the discussion of Impact AQ-24 under Alternative 1A.

Criteria pollutants from restoration and enhancement actions could exceed applicable general conformity *de minimis* levels and applicable local thresholds. The effect would vary according to the equipment used in construction of a specific conservation measure, the location, the timing of the actions called for in the conservation measure, and the air quality conditions at the time of implementation; these effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. The effect of increases in emissions during implementation of CM2–CM11 in excess of applicable general conformity *de minimis* levels and air district thresholds (Table 22-8) could violate air basin SIPs and worsen existing air quality conditions. Mitigation Measure AQ-24 would be available to reduce this effect, but emissions would still be adverse.

CEQA Conclusion: Construction and operational emissions associated with the restoration and enhancement actions would result in a significant impact if the incremental difference, or increase, relative to Existing Conditions exceeds the applicable local air district thresholds shown in Table 22-8; these effects are expected to be further evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measure AQ-24 would be available to reduce this effect, but may not be sufficient to reduce emissions below applicable air quality management district thresholds (see Table 22-8). Consequently, this impact would be significant and unavoidable.

Mitigation Measure AQ-24: Develop an Air Quality Mitigation Plan (AQMP) to Ensure Air District Regulations and Recommended Mitigation are Incorporated into Future Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-24 under Impact AQ-24 in the discussion of Alternative 1A.

Impact AQ-25: Exposure of Sensitive Receptors to Health Hazards from Localized Particulate Matter, Carbon Monoxide, and Diesel Particulate Matter from Implementation of CM2–CM11

NEPA Effects: The potential for Alternative 9 to expose sensitive receptors increased health hazards from localized PM, CO, and DPM would be similar to Alternative 1A. Activities shown in Table 22-29 with the greatest potential to have short or long-term air quality impacts are also anticipated to have the greatest potential to expose receptors to substantial pollutant concentrations. The effect would vary according to the equipment used, the location and timing of the actions called for in the conservation measure, the meteorological and air quality conditions at the time of implementation, and the location of receptors relative to the emission source. Potential health effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions.

The effect of increases in PM, CO, or DPM (cancer and non-cancer-risk) in excess of applicable air district thresholds (Table 22-8) at receptor locations could result in adverse health impacts. Mitigation Measures AQ-24 and AQ-25 would be available to reduce this effect.

***CEQA Conclusion*:** Construction and operational emissions associated with the restoration and enhancement actions under Alternative 9 would result in a significant impact if PM, CO, or DPM (cancer and non-cancer-risk) concentrations at receptor locations exceed the applicable local air district thresholds shown in Table 22-8; these effects are expected to be further evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measures AQ-24 and AQ-25 would ensure localized concentrations at receptor locations would be below applicable air quality management district thresholds (see Table 22-8). Consequently, this impact would be less than significant.

Mitigation Measure AQ-24: Develop an Air Quality Mitigation Plan (AQMP) to Ensure Air District Regulations and Recommended Mitigation are Incorporated into Future Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-24 under Impact AQ-24 in the discussion of Alternative 1A.

Mitigation Measure AQ-25: Prepare a Project-Level Health Risk Assessment to Reduce Potential Health Risks from Exposure to Localized DPM and PM Concentrations

Please see Mitigation Measure AQ-25 under Impact AQ-25 in the discussion of Alternative 1A.

Impact AQ-26: Creation of Potential Odors Affecting a Substantial Number of People from Implementation of CM2–CM11

NEPA Effects: The potential for Alternative 9 to expose sensitive receptors increased odors would be similar to Alternative 1A. Accordingly, construction activities associated with CM2-CM11 are not anticipated to result in nuisance odors. Similarly, while restored land uses associated with the program have the potential to generate odors from natural processes, the emissions would be similar in origin and magnitude to the existing land use types in the restored area (e.g., managed wetlands). Moreover, specific odor effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Accordingly, odor-related effects associated with CM2–CM11 would not be adverse.

***CEQA Conclusion*:** Alternative 9 would not result in the addition of major odor producing facilities. Diesel emissions during construction could generate temporary odors, but these would quickly dissipate and cease once construction is completed. Increases in wetland, tidal, and upland habitats may increase the potential for odors from natural processes. However, the origin and magnitude of odors would be similar to the existing land use types in the restored area (e.g., managed wetlands). Moreover, specific odor impacts would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions.

Accordingly, the impact of exposure of sensitive receptors to potential odors would be less than significant. No mitigation is required.

Impact AQ-27: Generation of Cumulative Greenhouse Gas Emissions from Implementation of CM2–CM11

NEPA Effects: CM2–CM11 implemented under Alternative 9 would result in local GHG emissions from construction equipment and vehicle exhaust. Restoration activities with the greatest potential for emissions include those that break ground and require use of earthmoving equipment. The type of restoration action and related construction equipment use are shown in Table 22-29. Implementing CM2–CM11 would also affect long-term sequestration rates through land use changes, such as conversion of agricultural land to wetlands, inundation of peat soils, drainage of peat soils, and removal or planting of carbon-sequestering plants.

Without additional information on site-specific characteristics associated with each of the restoration components, a complete assessment of GHG flux from CM2–CM11 is currently not possible. The effect of carbon sequestration and CH_4 generation would vary by land use type, season, and chemical and biological characteristics; these effects would be evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measures AQ-24 and AQ-27 would be available to reduce this effect. However, due to the potential for increases in GHG emissions from construction and land use change, this effect would be adverse.

***CEQA Conclusion*:** The restoration and enhancement actions under Alternative 9 could result in a significant impact if activities are inconsistent with applicable GHG reduction plans, do not contribute to a lower carbon future, or generate excessive emissions, relative to other projects throughout the state. These effects are expected to be further evaluated and identified in the subsequent project-level environmental analysis conducted for the CM2–CM11 restoration and enhancement actions. Mitigation Measures AQ-24 and AQ-27 would be available to reduce this impact, but may not be sufficient to reduce to a less-than-significant level. Consequently, this impact would be significant and unavoidable.

Mitigation Measure AQ-24: Develop an Air Quality Mitigation Plan (AQMP) to Ensure Air District Regulations and Recommended Mitigation are Incorporated into Future Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-24 under Impact AQ-24 in the discussion of Alternative 1A.

Mitigation Measure AQ-27: Prepare a Land Use Sequestration Analysis to Quantify and Mitigate (as Needed) GHG Flux Associated with Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-27 under Impact AQ-27 in the discussion of Alternative 1A.

22.3.4 Cumulative Analysis

Assessment Methodology

The air quality management agencies in the Study area have identified project-level thresholds to evaluate impacts to air quality (see Table 22-8). In developing these thresholds, the agencies considered levels at which project emissions would be cumulatively considerable. The air district thresholds have been adopted to prevent further deterioration of ambient air quality, which is influenced by emissions generated by projects within a specific air basin. The project-level thresholds therefore consider relevant past, present, and reasonably foreseeable future projects within the Plan area. For example, as noted in the BAAQMD's (2011) CEQA Guidelines,

> In developing thresholds of significance for air pollutants, BAAQMD considered the emission levels for which a project's individual emissions would be cumulatively considerable. If a project exceeds the identified significance thresholds, its emissions would be cumulatively considerable, resulting in significant adverse air quality impacts to the region's existing air quality conditions. Therefore, additional analysis to assess cumulative impacts is unnecessary.

And in the SMAQMD's (2011) CEQA Guidelines,

> The District's approach to thresholds of significance is relevant to whether a project's individual emissions would result in a cumulatively considerable adverse contribution to the SVAB's existing air quality conditions. If a project's emissions would be less than these levels, the project would not be expected to result in a cumulatively considerable contribution to the significant cumulative impact…If construction-generated NO_X emissions cannot be mitigated or offset below 85 lb/day, the project would substantially contribute to this **significant** air quality impact.

And in the SJVAPCD's (2002) CEQA Guidelines,

> Any proposed project that would individually have a significant air quality impact…would also be considered to have a significant cumulative air quality impact.

And in the YSAQMD's (2007) CEQA Guidelines,

> Any proposed project that would individually have a significant air quality impact (see above for project-level Thresholds of Significance) would also be considered to have a significant cumulative impact.

The emissions thresholds presented in Table 22-8 therefore represent the maximum emissions a project may generate before contributing to a cumulative impact on regional air quality. Therefore, exceedances of the project-level thresholds, as identified in Section 22.3.3, would be cumulatively considerable. As discussed in Section 22.3.2.1, the effects analysis for GHG emissions is cumulative due to the nature of GHGs and global climate change. Please refer to Impacts AQ-21, AQ-22, and AQ-23 in Section 22.3.3 for an evaluation of cumulative GHG impacts.

Cumulative Effects of the No Action Alternative

The cumulative effect of the No Action Alternative is anticipated to result in short-term emissions from construction activities and long-term reductions in criteria pollutants and GHG emissions. Construction of ongoing projects, programs, and plans under the No Action Alternative, when combined with emissions from ongoing and reasonably foreseeable future projects, would generate short-term emissions that could cumulatively affect regional and local air quality. Projects implemented under the No Action Alternative would be required to comply with air district rules and regulations to reduce construction-related criteria pollutant and GHG emissions. It is anticipated that similar construction projects in study area, including those listed in Appendix 3D, *Defining Existing Conditions, the No Action/No Project Alternative, and Cumulative Impact Conditions* would also be required to implement similar measures to reduce project-level construction-related emissions. Long-term operation of the No Action Alternative would result in a net decrease in all criteria air pollutants and GHGs, potentially contributing to a regional air quality benefit. However, a portion of this benefit may be offset by operational emissions generated by future projects implemented in the study area.

The Delta and vicinity are within a highly active seismic area, with a generally high potential for major future earthquake events along nearby and/or regional faults, and with the probability for such events increasing over time. Based on the location, extent and non-engineered nature of many existing levee structures in the Delta area, the potential for significant damage to, or failure of, these structures during a major local seismic event is generally moderate to high. (See Appendix 3E, *Potential Seismic and Climate Change Risks to SWP/CVP Water Supplies* for more detailed discussion). To reclaim land or rebuild levees after a catastrophic event due to climate change or a seismic event would introduce considerable heavy equipment and associated vehicles, including dozers, excavators, pumps, water trucks, and haul trucks, which would generate emissions and create adverse air quality effects. While similar risks would occur under implementation of the action alternatives, these risks may be reduced by BDCP-related levee improvements along with those projects identified for the purposes of flood protection in Appendix 3D, *Defining Existing Conditions, the No Action/No Project Alternative, and Cumulative Impact Conditions*.

Cumulative Effects of the Action Alternatives

Impact AQ-28: Cumulative Generation of Regional Criteria Pollutants in Excess of Air District Threshold during Construction of the Water Conveyance Facility

NEPA Effects: The project-level analysis performed in Section 22.3.3 evaluates significance within each Study area air district. While the thresholds summarized in Table 22-8 can be applied to evaluate cumulative impacts within individual air districts, this impact assessment considers exceedances of one more air district threshold to result in a cumulatively considerable *regional* air quality impact. This approach was chosen out of an abundance of caution to capture regional air quality impacts and account for potential emissions transport between the four air districts.

Table 22-153 summarizes the project-level regional effects for construction of the water conveyance facilities associated with Alternatives 1A, 2A, and 6A; 1B, 2B, and 6B; 1C, 2C, and 6C; 3; 4, 7, and 8; 5; and 9 in each Study area air district without mitigation. Adverse effects are highlighted with <u>underline</u> text.

Table 22-153. Project-Level Determinations for Construction of the Water Conveyance Facilities Associated with BDCP (Impacts AQ-1 through AQ-4 and Impact AQ-20)

	Potential Effects for Impacts AQ-1 through AQ-4 and Impact AQ-20					
Alternative/ Air District	ROG	NO_X	CO	PM10	PM2.5	SO_2
Alternatives 1A, 2A, and 6A						
SMAQMD	A[a]	A	NA	A[a]	NA	NA
YSAQMD	A[a]	A	NA	A	NA	NA
BAAQMD	A	A	NA	NA	NA	NA
SJVAPCD	A	A	NA	A	NA	NA
Alternatives 1B, 2B, and 6B						
SMAQMD	A[a]	A	NA	A[a]	NA	NA
YSAQMD	A[a]	A	NA	A	NA	NA
BAAQMD	A	A	NA	NA	NA	NA
SJVAPCD	A	A	NA	A	A	NA
Alternatives 1C, 2C, and 6C						
SMAQMD	A[a]	A	NA	NA	NA	NA
YSAQMD	A	A	NA	A	NA	NA
BAAQMD	A	A	NA	NA	NA	NA
SJVAPCD	NA	NA	NA	NA	NA	NA
Alternative 3						
SMAQMD	A[a]	A	NA	NA	NA	NA
YSAQMD	NA	NA	NA	A	NA	NA
BAAQMD	A	A	NA	NA	NA	NA
SJVAPCD	A	A	NA	A	NA	NA
Alternative 4						
SMAQMD	NA	A	NA	NA	NA	NA
YSAQMD	NA	NA	NA	NA	NA	NA
BAAQMD	A	A	NA	NA	NA	NA
SJVAPCD	A	A	NA	A	NA	NA
Alternatives 5						
SMAQMD	NA	A	NA	NA	NA	NA
YSAQMD	NA	NA	NA	NA	NA	NA
BAAQMD	A	A	NA	NA	NA	NA
SJVAPCD	A	A	NA	A	NA	NA
Alternatives 7 and 8						
SMAQMD	A[a]	A	NA	NA	NA	NA
YSAQMD	A[a]	A	NA	A	NA	NA
BAAQMD	A	A	NA	NA	NA	NA
SJVAPCD	A	A	NA	A	NA	NA
Alternative 9						
SMAQMD	A[a]	A	NA	A[a]	NA	NA
YSAQMD	A[a]	A[a]	NA	A[a]	NA	NA
BAAQMD	A	A	NA	NA	NA	NA
SJVAPCD	NA	A	NA	A	NA	NA

[a] Effect would occur in the SFNA (combined activities in SMAQMD and YSAQMD).
NA = Not adverse.
A = Adverse.

Based on the data presented in Table 22-153, all alternatives would exceed one or more air district threshold and would therefore result in adverse cumulative effects on regional air quality in the region. Exceedances of air district regional thresholds could lead to exceedances of applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Combined effects of project-level ROG and NO_X emissions with other emissions sources in the air basin could increase photochemical reactions and the formation of tropospheric ozone. While increases in ozone may contribute to adverse health effects, it is important to note that an increase in ozone does not guarantee an increase in respiratory ailments since some individuals may be exposed to certain concentrations of ozone and experience no symptoms. Nevertheless, the effect of generating emissions in excess of regional air district thresholds would be cumulatively considerable and adverse.

Mitigation Measures AQ-1 through AQ-4 are available to address ROG, NO_X, PM10, and PM2.5 effects for all alternatives except Alternatives 1C, 2C, and 6C. Although Mitigation Measures AQ-3a and AQ-3b would be available to reduce ROG and NO_X in the BAAQMD, given the magnitude of estimated emissions, neither measure would reduce emissions below district thresholds.[64] Accordingly, construction of Alternatives 1C, 2C, and 6C would result in an adverse and cumulative air quality effect in the BAAQMD.

CEQA Conclusion: Emissions generated by Alternatives 1A through 9 would exceed one or more air district threshold. As discussed above, the air district thresholds represent the maximum emissions a project may generate before contributing to a cumulative impact on regional air quality. Consequently, exceedances of the project-level thresholds, as identified in Table 22-153, would result in a cumulatively considerable regional air quality impact.

Exceedances of air district regional thresholds could lead to exceedances of applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Combined effects of project-level ROG and NO_X emissions with other emissions sources in the air basin could increase photochemical reactions and the formation of tropospheric ozone. While increases in ozone may contribute to adverse health effects, it is important to note that an increase in ozone does not guarantee an increase in respiratory ailments since some individuals may be exposed to certain concentrations of ozone and experience no symptoms. Nevertheless, the impact of generating emissions in excess of regional air district thresholds would be cumulatively considerable and significant.

Mitigation Measures AQ-1 through AQ-4 are available to reduce ROG, NO_X, PM10, and PM2.5 to less than significant by offsetting emissions below air district CEQA thresholds for all Alternatives except Alternatives 1C, 2C, and 6C. Although Mitigation Measures AQ-3a and AQ-3b would be available to reduce ROG and NO_X in the BAAQMD, given the magnitude of estimated emissions, neither measure would reduce emissions below district thresholds.[65] Accordingly, construction of Alternatives 1C,

---

[64] The amount of moneys required to achieve sufficient contracts to reduce project emissions below air district thresholds would require immediate and substantial outreach, staffing, and other resources. There are also a number of hurdles related to accelerating equipment turnover and identifying available projects. While the mitigation measure will reduce project emissions, it is unlikely sufficient resources can be identified to reduce emissions by the amount required to achieve a less-than-significant finding.

[65] The amount of moneys required to achieve sufficient contracts to reduce project emissions below air district thresholds would require immediate and substantial outreach, staffing, and other resources. There are also a number of hurdles related to accelerating equipment turnover and identifying available projects. While the mitigation measure will reduce project emissions, it is unlikely sufficient resources can be identified to reduce emissions by the amount required to achieve a less-than-significant finding.

2C, and 6C in the BAAQMD would result in a cumulative air quality effect (i.e., significant and unavoidable).

Mitigation Measure AQ-1a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-1a under Impact AQ-1 in the discussion of Alternative 1A.

Mitigation Measure AQ-1b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SFNA to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-1b under Impact AQ-1 in the discussion of Alternative 1A.

Mitigation Measure AQ-3a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within BAAQMD/SFBAAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable BAAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-3a under Impact AQ-3 in the discussion of Alternative 1A.

Mitigation Measure AQ-3b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the BAAQMD/SFBAAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable BAAQMD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-3b under Impact AQ-3 in the discussion of Alternative 1A.

Mitigation Measure AQ-4a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4a under Impact AQ-4 in the discussion of Alternative 1A.

Mitigation Measure AQ-4b: Develop an Alternative or Complementary Offsite Mitigation Program to Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the SJVAPCD/SJVAB to Net Zero (0) for Emissions in Excess of General Conformity *De Minimis* Thresholds (Where Applicable) and to Quantities below Applicable SJVAPCD CEQA Thresholds for Other Pollutants

Please see Mitigation Measure AQ-4b under Impact AQ-4 in the discussion of Alternative 1A.

Impact AQ-29: Cumulative Generation of Criteria Pollutants in Excess of Air District Regional Threshold during Operation of the Water Conveyance Facility

NEPA Effects: As shown in Impacts AQ-5 through AQ-8, operation and maintenance activities under all alternatives would not exceed the regional air district thresholds of significance. Consequently, there would be no cumulative adverse effect to regional air quality.

***CEQA Conclusion*:** Emissions generated during operation and maintenance activities would not exceed the air district regional thresholds for criteria pollutants. The emissions thresholds (Table 22-8) have been adopted to ensure projects do not contribute to cumulative, regional air quality impacts. Projects that do not violate the thresholds are not cumulatively considerable. The impact would be less than cumulatively considerable (i.e., less than significant). No mitigation is required.

Impact AQ-30: Expose Sensitive Receptors to Cumulative Localized Pollutant Concentrations (PM, CO, and DPM) from Construction of CM1

NEPA Effects: The BDCP HRA analyzing construction activities found that of the 15 alternatives considered, all the alternatives would expose sensitive receptors to significant increases in DPM with the exception of Alternative 4. Localized PM10 concentrations for all alternatives were found to exceed significance thresholds at one or more air districts. Localized PM2.5 concentrations under Alternatives 1B, 2B, and 6B would exceed SJVAPCD's 24-hour and annual concentration thresholds. No exceedances of the CAAQS for CO are expected under any of the alternatives.

Mitigation Measure AQ-9 outlines a tiered strategy to reduce PM10 concentrations and public exposure to significant health hazards. Similarly, Mitigation Measure AQ-16 would be available to reduce exposure to substantial cancer risk by relocating affected receptors.

Despite the availability of mitigation, there are several reasons why project-specific DPM, PM10, and PM2.5 emissions associated with all alternatives in the affected air districts may contribute to significant cumulative health hazards. First, there are several other proposed projects (listed in Appendix 3D, *Defining Existing Conditions, No Action Alternative, No Project Alternative, and Cumulative Impact Conditions*) that could contribute construction-related DPM, PM10, and PM2.5 emissions in these air districts. In addition, existing operational emissions in these areas from on-road vehicles, boats, area sources, and stationary sources may contribute to cumulative DPM, PM10, and PM2.5 concentrations. As a result, construction of any of the alternatives would result in an adverse cumulative contribution to pollutant concentrations at sensitive receptors within these air basins. This effect would be cumulatively considerable.

***CEQA Conclusion*:** Construction of the BDCP water conveyance features would contribute to significant cumulative health risks at sensitive receptors. While Mitigation Measures AQ-9 and AQ-14 would reduce project specific health risks, emissions generated from the development of each alternative would still be cumulatively significant based on the contribution from other existing operational emission sources. This impact would be significant and unavoidable.

Mitigation Measure AQ-9: Implement Measures to Reduce Re-Entrained Road Dust and Receptor Exposure to PM2.5 and PM10

Please see Mitigation Measure AQ-9 under Impact AQ-9 in the discussion of Alternative 1A.

Mitigation Measure AQ-16: Relocate Sensitive Receptors to Avoid Excess Cancer Risk

Please see Mitigation Measure AQ-16 under Impact AQ-16 in the discussion of Alternative 1A.

Impact AQ-31: Generation of Cumulative Regional Criteria Pollutants from Implementation of CM2–CM11

NEPA Effects: Implementation of the CM2–CM11 could generate additional traffic on roads and highways in and around Suisun Marsh and the Yolo Bypass related to restoration or monitoring activities. Habitat restoration and enhancement activities that require physical changes or heavy-duty equipment would generate construction emissions through earthmoving activities and heavy-duty diesel-powered equipment. The intensity and frequency of vehicle trips and construction activities associated with the CM2–CM11 are assumed to be relatively minor, but could exceed local air district thresholds in the Study area. The effect would vary according to the equipment used in construction of a specific conservation measure, the timing of the actions called for in the conservation measure, and the air quality conditions at the time of implementation.

Exceedances of air district regional thresholds could lead to exceedances of applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Combined effects of project-level ROG and NO_X emissions with other emissions sources in the air basin could increase photochemical reactions and the formation of tropospheric ozone. While increases in ozone may contribute to adverse health effects, it is important to note that an increase in ozone does not guarantee an increase in respiratory ailments since some individuals may be exposed to certain concentrations of ozone and experience no symptoms. Nevertheless, the impact of generating emissions in excess of regional air district thresholds would be cumulatively considerable. Mitigation Measure AQ-24 would be available to reduce this effect, but emissions would still be adverse.

***CEQA Conclusion*:** Cumulative construction and operational emissions associated with the restoration and enhancement actions could exceed applicable air district thresholds. Exceedances of air district regional thresholds could lead to exceedances of applicable air quality standards in the Study area and could contribute to or worsen an existing air quality conditions. Combined effects of project-level ROG and NO_X emissions with other emissions sources in the air basin could increase photochemical reactions and the formation of tropospheric ozone. While increases in ozone may contribute to adverse health effects, it is important to note that an increase in ozone does not guarantee an increase in respiratory ailments since some individuals may be exposed to certain concentrations of ozone and experience no symptoms. Nevertheless, the impact of generating emissions in excess of regional air district thresholds would be cumulatively considerable. Mitigation Measure AQ-18 would be available to reduce this effect, but may not be sufficient to reduce emissions below applicable air quality management district thresholds (see Table 22-8). Consequently, this impact would be cumulatively considerable and significant and unavoidable.

Mitigation Measure AQ-24: Develop an Air Quality Mitigation Plan (AQMP) to Ensure Air District Regulations and Recommended Mitigation are Incorporated into Future Conservation Measures and Associated Project Activities

Please see Mitigation Measure AQ-24 under Impact AQ-24 in the discussion of Alternative 1A.

Impact AQ-32: Expose Sensitive Receptors to Cumulative Localized Pollutant Concentrations (PM, CO, and DPM) from Implementation of CM2 through CM11

NEPA Effects: Additional traffic and heavy-duty equipment required to implement CM2-CM11 would generate emissions that could expose nearby receptors to local concentrations of PM, CO, and DPM. Proposed projects (listed in Appendix 3D) adjacent to restoration sites could increase pollutant concentrations at exposed receptors. Effects would vary according to the equipment used, locations of emissions sources and receptors, and underlying meteorology. Increases in PM, CO, or DPM (cancer and non-cancer-risk) at receptors sites could result in adverse health impacts. Mitigation Measure AQ-25 is available to address the effect and requires preparation of a site-specific HRA for all restoration sites adjacent to sensitive receptors. The HRA would not only consider project-level emissions, but also cumulative contributions from other reasonably foreseeable projects, as required by local air district CEQA guidelines.

***CEQA Conclusion*:** Additional traffic and heavy-duty equipment required to implement CM2-CM11 would generate emissions that could expose nearby receptors to local concentrations of PM, CO, and DPM. Proposed projects (listed in Appendix 3D) adjacent to restoration sites could increase pollutant concentrations at exposed receptors. Increases in PM, CO, or DPM (cancer and non-cancer-risk) at receptors sites could result in adverse health impacts. Mitigation Measure AQ-25 requires preparation of a site-specific HRA for all restoration sites adjacent to sensitive receptors. The HRA would not only consider project-level emissions, but also cumulative contributions from other reasonably foreseeable projects, as required by local air district CEQA guidelines. Consequently, this impact would be less than significant with mitigation.

Mitigation Measure AQ-25: Prepare a Project-Level Health Risk Assessment to Reduce Potential Health Risks from Exposure to Localized DPM and PM Concentrations

Please see Mitigation Measure AQ-25 under Impact AQ-25 in the discussion of Alternative 1A.

22.4 References Cited

22.4.1 Printed References

5RMK, Inc. 2014. Air Quality Tables for Bay Delta Conservation Plan Cost Estimate.

American Lung Association. 2012. Lung Cancer Fact Sheet. Available: <http://www.lung.org/lung-disease/lung-cancer/resources/facts-figures/lung-cancer-fact-sheet.html>. Accessed: January 15, 2013.

Bay Area Air Quality Management District. 2010. *Source Inventory of Bay Area Greenhouse Gas Emissions*. Last revised: February 2010. Available: <http://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/Emission%20Inventory/regionalinventory2007_2_10.ashx>. Accessed: June 27, 2013.

———. 2011. *California Environmental Quality Act Air Quality Guidelines.* June. San Francisco, CA.

———. 2015. CEQA Guidelines. Accessed: April 21, 2015. Available: <http://www.baaqmd.gov/Divisions/Planning-and-Research/CEQA-GUIDELINES.aspx>

Blasing, T. J. 2014. *Recent Greenhouse Gas Concentrations*. DOI: 10.3334/CDIAC/atg.032. Updated February.

California Air Pollution Control Officers Association (CAPCOA). 2009. *Health Risk Assessments for Proposed Land Use Projects.* CAPCOA Guidance Document. Available: <http://www.capcoa.org/> July.

California Air Resources Board. 1998. Findings of the Scientific Review on The Report on Diesel Exhaust. Adopted April 22. Available: <http://www.arb.ca.gov/toxics/dieseltac/combined.pdf>. Accessed: February 9, 2012.

———. 2000. *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles*. Sacramento, CA. Prepared by Stationary Source Division and Mobile Source Control Division.

———. 2004. *2004 Revision to the California State Implementation Plan for Carbon Monoxide*. July.

———. 2009. *The California Almanac of Emissions and Air Quality – 2009 Edition*.

———. 2010. Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling: Compression-Ignition. NR-009d.

———. 2011a. *Status of Scoping Plan Recommended Measures*. Available: <http://www.arb.ca.gov/cc/scopingplan/status_of_scoping_plan_measures.pdf>. Accessed: February 9, 2012.

———. 2011b. *Transport*. Last Revised: March 3, 2011. Available: <http://www.arb.ca.gov/aqd/transport/transport.htm>. Accessed: May 4, 2012.

———. 2012a. *Emissions Estimation Methodology for Commercial Harbor Craft Operating in California*. February.

———. 2012b. PennzSuppress D-Dust Suppressant. Last Revised: August 27, 2012. Available: <http://www.arb.ca.gov/eqpr/pennzoil/pennzoil.htm>. Accessed; May 21, 2015.

———. 2013. *Ambient Air Quality Standards*. Last revised: June 4, 2013. Available: <http://www.arb.ca.gov/research/aaqs/aaqs2.pdf>. Accessed: September 18, 2014.

———. 2014a. *California Greenhouse Gas Inventory for 2000-2012— by Category as Defined in the 2008 Scoping Plan*. Last Revised: May 24, 2014. Available: <http://www.arb.ca.gov/cc/inventory/data/tables/ghg_inventory_scopingplan_00-12_2014-03-24.pdf>. Accessed: September 18, 2014.

———. 2014b. *iADAM Air Quality Data Statistics*. Available: <http://www.arb.ca.gov/adam/index.html>. Accessed: September 18, 2014.

———. 2014c. *Area Designations Maps/ State and National*. Last Revised: August 22, 2014. Available: <http://www.arb.ca.gov/desig/adm/adm.htm>. Accessed: September 18, 2014.

Center for Climate and Energy Solutions. 2011. The Greenhouse Effect. Available: <http://www.c2es.org/facts-figures/basics/greenhouse-effect>. Accessed: January 17, 2012.

Council on Environmental Quality. 2010. *Draft NEPA Guidance on Consideration of the Effects of Climate Change and Greenhouse Gas Emissions*. Memorandum for Heads of Federal Departments and Agencies. February 18. Available: <http://ceq.hss.doe.gov/nepa/regs/Consideration_of_Effects_of_GHG_Draft_NEPA_Guidance_FINAL_02182010.pdf>.

———. 2014. *Revised Draft NEPA Guidance on Consideration of the Effects of Climate Change and Greenhouse Gas Emissions*. Memorandum for Heads of Federal Departments and Agencies. December. Available: <http://www.whitehouse.gov/sites/default/files/docs/nepa_revised_draft_ghg_guidance_searchable.pdf>.

Countless Environmental. 2006. WRAP Fugitive Dust Handbook. September.

Delucchi, M. 2006. *Emissions of Criteria Pollutants, Toxic Air Pollutants, and Greenhouse Gases, from the Use of Alternative Transportation Modes and Fuels*. Table 24. University of California Davis. January.

ENVIRON. 2013. California Emissions Estimator MODel User's Guide. Version 2013.2. July.

Georgetown Climate Center. 2012. *Summary of the Federal District Court's Order Enjoining California's Low Carbon Fuel Standard*. Available: <http://www.georgetownclimate.org/sites/default/files/Summary_of_Court_Enjoining_CA_LCFS.pdf>. Accessed: May 1, 2012.

———. 2012. *Technical Findings from the Sacramento Municipal Utility District's GHG Forecast and Reduction Measure Analysis*. Final Report. March. Sacramento, CA. (ICF 00773.10). Prepared for Sacramento Municipal Utility District, Sacramento, CA.

———. 2007a. *Introduction*. In B. Metz, O. R. Davidson, P. R. Bosch, R. Dave, L. A. Meyer, (eds.), *Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, 2007.* Cambridge, U.K. and New York, NY, USA: Cambridge University Press. Available: <http://www.ipcc.ch/pdf/assessment-report/ar4/wg3/ar4-wg3-chapter1.pdf>. Accessed: August 11, 2009.

———. 2007b. *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K. B. Averyt, M. Tignor and H. L. Miller (eds.). Available: <http://www.ipcc.ch/ipccreports/ar4-wg1.htm>. Accessed: September 22, 2009.

Legislative Analyst's Office. 2012. *Evaluating the Policy Trade-Offs in ARB's Cap-and-Trade Program.* February.

Myhre, G., D. Shindell, F.-M. Bréon, W. Collins, J. Fuglestvedt, J. Huang, D. Koch, J.-F. Lamarque, D. Lee, B. Mendoza, T. Nakajima, A. Robock, G. Stephens, T. Takemura, and H. Zhang. 2013. *Anthropogenic and Natural Radiative Forcing. In: Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* [Stocker, T. F., D. Qin, G.-K. Plattner, M. Tignor, S. K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex, and P. M. Midgley (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp. 659–740.

National Oceanic and Atmospheric Administration. 2005. *Greenhouse Gases: Frequently Asked Questions*. Available: <http://lwf.ncdc.noaa.gov/oa/climate/gases.html>. Accessed: September 22, 2009.

———. 2008. Salt Marshes. Available: <http://oceanservice.noaa.gov/education/kits/estuaries/media/supp_estuar06a_saltmarsh.html>. Accessed: June 12, 2014

———. 2014. Up-to-date weekly average CO2 at Mauna Loa. Available: <http://www.esrl.noaa.gov/gmd/ccgg/trends/weekly.html>. Accessed: September 18, 2014.

Nisbet, M., Marceau, M., and vanGeem, M. 2002. *Environmental Life Cycle Inventory of Portland Cement Concrete.* PCA R&D Serial No. 2137a. July.

Occupational Safety and Health Administration. 2005. Hydrogen Sulfide. Available: <https://www.osha.gov/OshDoc/data_Hurricane_Facts/hydrogen_sulfide_fact.pdf>. Accessed: June 13, 2014.

Office of Environmental Health Hazard Assessment. 2003. Air Toxics Hot Spots Program Risk Assessment Guidelines, The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments. Oakland, CA.

———. 2009. Technical Support Document for Cancer Potency Factors: Methodologies for derivation, listing of available values, and adjustments to allow for early life exposures. California Environmental Protection Agency. May.

Office of Environmental Health Hazard Assessment and California Air Resources Board. 2012. Consolidated Table of OEHHA/CARB Approved Risk Assessment Health Values. Table 1. Available: <http://www.arb.ca.gov/toxics/healthval/contable.pdf>.

Sacramento Metropolitan Air Quality Management District. 2011. *Concrete Batching Operations Policy Manual*. March.

———. 2014. *Guide to Air Quality Assessment in Sacramento County.* Sacramento, CA. Revised June 2014.

Sacramento Valley Air Quality Engineering and Enforcement Professionals. 2010. *Northern Sacramento Valley Planning Area 2009 Triennial Air Quality Attainment Plan*. Final. Sacramento, CA.

San Joaquin Valley Air Pollution Control District. 2002. *Guide for Assessing and Mitigating Air Quality Impacts*. Mobile Source/CEQA Section of the Planning Division of the San Joaquin Valley Unified Air Pollution Control District. Fresno, CA.

———. 2009. *Final Draft Staff Report: Addressing Greenhouse Gas Emissions under the California Environmental Quality Act.* September.

San Joaquin Valley Air Pollution Control District. 2015. *Guide for Assessing and Mitigating Air Quality Impacts*. March.

Slag Cement Association. 2013. Slag Cement in Concrete. *Slag Cement and the Environment*, No. 22.

Teodoru, C.R., Bastien, J., Bonneville, M.C., del Giorgio, P.A., Demarty, M…Tremblay, A. 2012. The net carbon footprint of a newly created boreal hydroelectric reservoir. *Global Biogeochemical Cycles.* 26(2).

Trulio, L. 2007. *Notes on Carbon Sequestration and Tidal Salt Marsh Restoration*. State University, San Jose.

URS. 2014. Reusable Tunnel Material Testing Report. Prepared for Department of Water Resources. March.

U.S. Climate Change Science Program. 2007. *The First State of the Carbon Cycle Report (SOCCR)*. November.

U.S. Environmental Protection Agency. 1998. *Compilation of Air Pollutant Emission Factors*. Section 11.9 Western Surface Coal Mining. Available: <http://www.epa.gov/ttn/chief/ap42/index.html>. Accessed: October 2014.

———. 2002. *Health Assessment Document for Diesel Engine Exhaust*. Available: <http://www.epa.gov/ttn/atw/dieselfinal.pdf>. Accessed: January 15, 2013.

———. 2006a. *High Global Warming Potential (GWP) Gases*. Available: <http://www.epa.gov/highgwp/scientific.html>. Accessed: September 22, 2009.

———. 2006b. *Compilation of Air Pollutant Emission Factors.* Section 13.2.2, Unpaved Roads. Available: <http://www.epa.gov/ttn/chief/ap42/index.html>. Accessed: October 2014.

———. 2006c. *Compilation of Air Pollutant Emission Factors.* Section 11.12, Concrete Batching. Available: <http://www.epa.gov/ttn/chief/ap42/index.html>. Accessed: October 2014.

———. 2007. *Greenhouse Gas Emissions from Freight Trucks*. Presentation at the International Emissions Inventory Conference. May 16.

———. 2009. *Current Methodologies in Preparing Mobile Source Port-Related Emissions Inventories.* April.

———. 2010. *Criteria Pollutant Information.* Last Revised: July 1, 2010. Available: <http://www.epa.gov/air/urbanair/>. Accessed: October 14, 2011.

———. 2011. *Compilation of Air Pollutant Emission Factors.* Section 13.2.1, Paved Roads. Available: <http://www.epa.gov/ttn/chief/ap42/ch13/bgdocs/b13s0201.pdf>. Accessed: October 2014.

U.S. Environmental Protection Agency. 2014a. *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2012*. EPA 430-R-14-003. April. Available: <http://www.epa.gov/climatechange/ghgemissions/usinventoryreport.html>. Accessed: September 18, 2014.

———. 2014b. *Monitor Values Report*. Last Revised: July 11, 2014. Available: <http://www.epa.gov/airdata/ad_rep_mon.html>. Accessed: September 18, 2014.

———. 2014c. *The Greenbook Nonattainment Areas for Criteria Pollutants*. Last Revised: July 2, 2014 Available: <http://www.epa.gov/oar/oaqps/greenbk/>. Accessed: September 18, 2014.

———. 2014d. *Emissions & Generation Resource Integrated Database (eGRID)*. Version 1.0. Available: <http://www.epa.gov/cleanenergy/energy-resources/egrid/>>. Accessed: September 23, 2014.

———. 2014e. Greenhouse Gas Equivalencies Calculator. Available: <http://www.epa.gov/cleanenergy/energy-resources/calculator.html>. Assessed: February 4, 2015.

———. 2014f. 2005 National-Scale Air Toxics Assessment. Available: <http://www.epa.gov/ttn/atw/nata2005/index.html>. Assessed: May 29, 2015.

U.S. Geological Survey. 2000. *Operational Guidelines (version 1.0) for Geological Fieldwork in Areas Endemic for Coccidioidomycosis (Valley Fever)*.

Yolo County. 2011. *Yolo County Climate Action Plan*. Adopted: March 15.

Yolo-Solano Air Quality Management District. 2007. *Handbook for Assessing and Mitigating Air Quality Impacts*. Davis, CA. Adopted: June 11.

22.4.2 Personal Communications

Huss, K., and R. DuBose. Sacramento Metropolitan Air Quality Management District—May 31, 2012. Conference call held with URS to discuss assumptions to use for the BDCP HRA.

Jones, Matt (A). Yolo-Solano Air Quality Management District. Woodland, CA—June 1, 2012. Conference call held with URS to discuss assumptions to use for the BDCP HRA.

Jones, Matt (B). Yolo-Solano Air Quality Management District. Woodland, CA – March 20, 2015. Email message to Tin Cheung.

Lighthouse, David. San Joaquin Valley Air Pollution Control District. Fresno, CA—September 11, 2014. Email message to Laura Yoon with Valley Fever Hospitalization rates.

Martien, P. Bay Area Air Quality Management District. San Francisco, CA—June 4, 2012. Conference call held with URS to discuss assumptions to use for the BDCP HRA.

Martien, P. and Lau, V. Bay Area Air Quality Management District. San Francisco, CA—July 2, 2012. Conference call held with URS to discuss assumptions to use for the BDCP HRA.

Siong, Patia. Air Quality Planner. San Joaquin Valley Unified Air Pollution Control District, Modesto, CA. May 23 and September 13, 2011—email with Shannon Hatcher of ICF International regarding construction health risk assessment procedures for diesel exhaust from construction equipment in the San Joaquin Valley Air Basin, PM10 and PM2.5 construction thresholds, Dust Control Plan to satisfy Regulation VIII requirements, and use of use a Voluntary Emission Reduction Agreement to mitigate CEQA impacts to less than significant.

Siong, Patia. Air Quality Planner. San Joaquin Valley Unified Air Pollution Control District, Modesto, CA. May 7, 2012—email with Laura Yoon the Voluntary Emission Reduction Agreement.

Siong, Patia. Air Quality Planner. San Joaquin Valley Unified Air Pollution Control District, Modesto, CA. April 29, 2015—email to Shannon Hatcher, ICF International.

Villalvazo, L., Siong, P., and D. Barber. San Joaquin Valley Air Pollution Control District - June 6, 2012. Conference call held with URS to discuss assumptions to use for the BDCP HRA.

Villalvazo, L. San Joaquin Valley Air Pollution Control District - June 6, 2012. E-mail to A. Tamhane, J. Tamimi, T. Rimpo, and M. Giglini, URS - Regarding SJVAPCD Guidance on construction HRA.