Draft 2017 Clean Air Plan: Spare the Air, Cool the Climate
A Blueprint for Clean Air and Climate Protection in the Bay Area

DRAFT PROGRAM
ENVIRONMENTAL IMPACT REPORT

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1.0 INTRODUCTION AND EXECUTIVE SUMMARY

1.1 INTRODUCTION

The Bay Area Air Quality Management District (Air District or BAAQMD) is preparing the 2017 Clean Air Plan/Regional Climate Protection Strategy (2017 Plan). The 2017 Plan is a roadmap for the Air District's efforts over the next few years to reduce air pollution and protect public health and the global climate. The 2017 Plan is required by the California Clean Air Act (CAA) to identify potential rules, control measures, and strategies for the Bay Area to implement in order to meet state air quality standards for ozone. The 2017 Plan update includes the Bay Area's first comprehensive Regional Climate Protection Strategy (RCPS), which will identify potential rules, control measures, and strategies that the Air District can pursue to reduce greenhouse gases (GHGs) in the Bay Area. The proposed 2017 Plan provides a strategy for reducing emissions of ozone precursors, GHGs, particulate matter (PM), and toxic air contaminants (TACs) in the Bay Area.

The California CAA requires regions that do not meet the State ozone standards to prepare plans for attaining the standards, and to update these plans every three years. These plans must include estimates of current and future emissions of the pollutants that form ozone, and a control strategy to reduce these emissions. The first Bay Area plan for the State ozone standards was the 1991 Clean Air Plan. Subsequently, the Clean Air Plan was updated and revised in 1994, 1997, 2000, 2005, and 2010. Each of these triennial updates proposed additional measures to reduce emissions from a wide range of sources, including industrial and commercial facilities, motor vehicles, and "area sources."

Within in the past decade, the concept of planning on a multi-pollutant basis, rather than on a pollutant by pollutant basis, has been embraced. The Air District took a step forward in its air quality planning by using an integrated, multi-pollutant approach for the Bay Area 2010 CAP which focused on reducing emissions of air pollutants that are most harmful to public health. The multi-pollutant plan addresses ozone, particulate matter, air toxics, and greenhouse gases via an integrated control strategy that is aimed at ozone planning requirements while identifying benefits and potential impacts of the control strategy on each of the pollutants. The 2017 Plan again employs a multi-pollutant approach to air quality planning in the Bay Area. The multi-pollutant 2017 Plan addresses ozone precursors, GHG emissions, PM emissions, and TAC emissions, via an integrated control strategy that identifies benefits and impacts of the control strategy on each of the pollutants for purposes of protecting public health and protecting the climate. The 2017 Plan also serves to update the most recent Bay Area ozone plan, the 2010 CAP, in compliance with the California CAA requirements for regional air districts that do not attain State ozone standards.

Ozone is the principal component of photochemical "smog." Ozone is highly reactive, and at high concentrations near ground level, can be harmful to public health. The 2017 Plan is a strategy to address progress of the 2010 CAP, implement additional control measures for emission reductions, and ensure that the region attains and maintains compliance with State ozone standards. Ozone is not directly emitted from pollution sources. Rather, ozone is formed in the atmosphere through complex chemical reactions between hydrocarbons (also known as "reactive organic gases" or "volatile organic compounds"), and nitrogen oxides, in the presence of sunlight. Efforts to reduce ozone seek to limit emissions of ROG and NOx into the atmosphere. In general, ROG comes from evaporation or incomplete combustion of fuels, from the use of solvents in cleaning operations and in paints and other coatings, and in various industrial and commercial operations. NOx is produced through combustion of fuels by mobile sources – cars, trucks, construction equipment, locomotives, aircraft, marine vessels – and stationary sources such as power plants and other industrial facilities.

The California and federal governments have established ambient air quality standards (AAQS) for ground level ozone (and other air pollutants) that are intended to protect human health from ozone's adverse effects. Air quality standards define the maximum amount of a pollutant that can be present in outdoor air without harm to public health. The standards are generally set at levels low enough to protect even the most sensitive individuals in area communities. National AAQS are set by the U.S. EPA, while State standards are set by the California Air Resources Board (CARB).

Air quality conditions in the San Francisco Bay Area have improved since the Air District was created in 1955. Ambient concentrations of air pollutants and the number of days on which the region exceeds air quality standards have been reduced. The Air District is in attainment of the State and federal ambient air quality standards for CO, NOx, and sulfur oxides (SOx). The Air District is unclassified for the federal 24-hour particulate matter less than 10 microns in diameter (PM10) standard and does not comply with the State 24-hour PM10 standard. Finally, the Bay Area is designated as a non-attainment area for the federal and state 8-hour ozone standard.

GHGs refer to gases that contribute to global warming. In addition to negative impacts on air quality as higher temperatures contribute to increased levels of ozone and PM, climate change may cause a wide range of ecological, social, economic, and demographic impacts at both the global and the local scale. The 2017 Plan will seek to maximize reductions of greenhouse gases, primarily carbon dioxide (CO_2) and methane, while crafting a control strategy to reduce ambient concentrations of ozone, PM, and TACs.

1.2 CALIFORNIA ENVIRONMENTAL QUALITY ACT

The California Environmental Quality Act (CEQA), Public Resources Code Section 21000 et seq., requires that the potential adverse environmental impacts of proposed projects be evaluated and that feasible methods to reduce or avoid identified significant adverse environmental impacts of these projects be identified. The 2017 Plan is the planning document that establishes policies and measures to achieve state and federal air quality standards in the Bay Area.

Pursuant to CEQA, this Program Environmental Impact Report (EIR) has been prepared to address the potential adverse impacts associated with implementation of the proposed 2017 Plan. Prior to making a decision on the 2017 Air Plan, the Air District Board of Directors must review and certify the EIR as providing adequate information on the potential adverse environmental impacts of implementing the proposed 2017 Plan.

1.2.1 NOTICE OF PREPARATION/INITIAL STUDY

A Notice of Preparation for the Bay Area 2017 Plan (included as Appendix A of this EIR) was distributed to responsible agencies and interested parties for a 30-day review on June 15, 2016. A notice of the availability of this document was distributed to other agencies and organizations and was placed on the Air District's web site, and was also published in newspapers throughout the area of the Air District's jurisdiction. Fifteen comment letters were submitted on the Initial Study and are included in Appendix B of this EIR.

1.2.2 TYPE OF EIR

CEQA provisions for program EIRs in connection with issuance of rules, regulations, plans, or other general criteria to govern the conduct of a continuing program, including adoptions of broad policy programs are separate from the provisions of EIRs prepared for specific types of projects (e.g., land use projects) (CEQA Guidelines §15168). The EIR for the 2017 Plan is a program EIR because it examines the environmental effects of proposed control measures that will ultimately be implemented through rules, or regulations and related programs promulgated as part of a continuing ongoing regulatory program.

A program EIR allows consideration of broad policy alternatives and program-wide mitigation measures at a time when an agency has greater flexibility to deal with basic problems of cumulative impacts. A program EIR also plays an important role in establishing a structure within which CEQA reviews of future related actions can be effectively conducted. This concept of covering broad policies in a program EIR and incorporating the information contained therein by reference into subsequent EIRs for specific projects is known as "tiering" (CEQA Guidelines §15152). A program EIR will provide the basis for future environmental analyses and will allow project-specific CEQA documents to focus solely on the new effects or detailed environmental issues not previously considered. If an agency finds that no new effects could occur, or no new mitigation measures would be required, the agency can approve the activity as being within the scope of the project covered by the program EIR, and no new environmental document would be required (CEQA Guidelines §15168(c)[5]).

The degree of specificity required in an EIR corresponds to the degree of specificity involved in the underlying activity described in the EIR (CEQA Guidelines §15146). Because the level of information regarding potential impacts from control measures recommended in the 2017 Plan is relatively general at this time, the environmental impact forecasts are also general or qualitative in nature.

1.2.3 INTENDED USES OF THIS DOCUMENT

In general, a CEQA document is an informational document that informs a public agency's decision-makers, and the public generally, of potentially significant adverse environmental effects of a project, identifies possible ways to avoid or minimize the significant effects, and describes reasonable alternatives to the project (CEQA Guidelines §15121). A public agency's decision-makers must consider the information in a CEQA document prior to making a decision on the project. Accordingly, this EIR is intended to: (a) provide the Air District's Board of Directors and the public with information on the environmental effects of the proposed project; and, (b) be used as a tool by the Air District's Board to facilitate decision making on the proposed project.

Additionally, CEQA Guidelines §15124(d)(1) requires a public agency to identify the following specific types of intended uses of a CEQA document:

1. A list of the agencies that are expected to use the EIR in their decision-making;
2. A list of permits and other approvals required to implement the project; and
3. A list of related environmental review and consultation requirements required by federal, state, or local laws, regulations, or policies.

Local public agencies, such as cities, and counties could be expected to tier off this EIR when considering land use and planning decisions related to projects that implement a control measure in the 2017 Plan, pursuant to CEQA Guidelines §15152. There is no State, federal or local permits required to adopt the 2017 Plan. However, implementation of some of the control measures will require various permits from all levels of government.

1.2.4 AREAS OF POTENTIAL CONTROVERSY

In accordance with CEQA Guidelines §15123(b)(2), the areas of controversy known to the lead agency including issues raised by agencies and the public shall be identified in the EIR. As noted above, fifteen comment letters were received on the Initial Study. Issues and concerns raised in the comment letters included: (1) assumptions used in the GHG emission reductions; (2) potential conflicts with the state GHG programs; (3) concerns that the Plan could continue to allow fossil fuel and a request to evaluate the decarbonization of transportation fuels as an alternative; (4) quantify the cumulative level of expected GHG emission reductions in the region; and (5) evaluate alternatives that would provide greater GHG emission reductions. Copies of the comment letters are provided in Appendix B.

1.3 CHAPTER 2 – PROJECT DESCRIPTION

The 2017 Plan is a roadmap for the Air District's efforts over the next few years to reduce air pollution and protect public health and the global climate. The 2017 Plan is required by the CAA to identify potential rules, control measures, and strategies for the Bay Area to implement in order to meet state standards for ozone. The proposed 2017 Plan provides a strategy for reducing emissions of ozone precursors, GHGs, PM, and TACs in the Bay Area.

1.3.1 CURRENT CONTROL STRATEGY

The 2017 Plan control strategy builds upon existing regional, State, and national programs that have successfully reduced air pollution and improved public health over the past several decades and also progresses attainment of California ozone standards. The 2017 Plan identifies all “feasible measures” for control of ozone precursors (and other pollutants) that will assist the Bay Area in attaining the California ozone standards and address pollutant transport to downwind regions, as required by the California CAA. The Plan was prepared in accordance with applicable provisions of the California CAA and updates the Bay Area 2010 Clean Air Plan.

1.3.2 2017 PLAN CONTROL STRATEGY

Chapter 1 of the 2017 Plan describes the purpose and scope of the 2017 Plan. Chapter 2 describes air pollution and the related health effects in the Bay Area. Chapter 3 describes the potential impacts expected in the Bay Area due to climate change, the GHG emissions addressed in the Plan and provides the foundation for the RCPS. Chapter 4 describes air quality planning activities in the Bay Area. Finally, Chapter 5 of the 2017 Plan provides descriptions of the individual control measures that comprise the 2017 Plan control strategy. Furthermore, the 2017 Plan focuses on two main goals: protecting and improving public health at both the regional scale and in communities most impacted by air pollution, and protecting the climate.

The 2017 Plan builds upon the foundations that were established in earlier ozone plans, including the 2010 CAP. The 2017 Plan control strategy is based upon the control measure categories of stationary sources, transportation, energy, buildings, agriculture, natural and working lands, waste management, water, and short lived climate pollutants.

The control strategy proposed a total of 85 control measures, in nine categories, as summarized below.

- 40 control measures to reduce emissions from stationary sources
- 23 transportation control measures
- 2 energy control measures
- 4 new and existing building control measures
- 4 agriculture control measures
- 3 natural and working lands control measures
- 4 waste management control measures
- 2 water control measures
- 3 short lived climate pollutant measures

Stationary Source Measures (SS) are measures that the District adopts and enforces pursuant to its authority to control emissions from factories, refineries, dry cleaners, gasoline stations, etc.

Eight of the 40 proposed SS measures in the 2017 Plan focus on reducing GHG emissions. The remainder of the proposed SS measures primarily focuses on protecting public health by reducing emissions of criteria pollutants and TACs from refineries and other sources.

Transportation Measures (TR) are measures to decrease emissions of criteria pollutants, TACs, and GHGs. The 23 TR measures aim to reduce demand for motor vehicle travel, promote efficient vehicles and transit service, decarbonize transportation fuels, and electrify motor vehicles and equipment.

Energy Measures (EN) focus on the energy sector of the Bay Area which includes GHG emissions from electricity used and generated within the Bay Area as well as electricity generated outside the Bay Area that is imported and used within the region. The EN measures proposed in the 2017 Plan will reduce emissions of criteria pollutants, TACs, and GHGs by decreasing electricity consumed in the Bay Area and reducing the carbon intensity of electricity by switching to less GHG intensive fuel sources for electricity generation.

Building Measures (BL) are measures that the Air District looks to adopt based upon its authority to regulate emissions from certain building sector sources such as boilers and water heaters. The BL control measures proposed will reduce emissions of air pollutants and GHGs by increasing the scope and pace of programs to improve the energy efficiency of existing buildings, promoting the use of electricity and on-site renewable energy in both existing and new buildings to reduce fossil fuel consumption, and working to ensure that new construction is designed to achieve zero net GHG emissions by 2020 (or the earliest possible date).

Agricultural Measures (AG) are measures that focus on reducing GHG emissions from every day agricultural operations. The Air District regulates agricultural (biomass) burning but has no direct regulatory authority over agricultural equipment, soil management, or animal waste. The four proposed agricultural control measures provide guidance such as promoting best practices for manure management and farming techniques to reduce carbon emissions, develop partnerships with the agricultural community to encourage voluntary actions to reduce GHG emissions, capture GHG by means of carbon sequestration and biogas recovery, and provide grants and incentives for diary digesters or other equipment or practices that reduce GHG emissions.

Natural and Working Lands Measures (NW) provide an opportunity to actually remove carbon from the atmosphere. The proposed control measures focus on increasing carbon sequestration on rangelands and wetlands, and promoting urban tree planting in order to absorb CO_2 and provide shade to reduce urban heat island effects.

Waste Management Measures (WA) emphasize the need for early and aggressive action to reduce emissions of methane and other short lived climate pollutants. The proposed WA measures focus on reducing or capturing methane emissions from landfills and composting facilities, diverting organic material away from landfills, and increasing waste diversion rates through efforts to reuse, reduce and recycle.

Water Measures (WR) look at both directly and indirectly generated GHG emissions that result from water supplies and wastewater treatment throughout the Bay Area. The proposed WA measures will reduce emissions of criteria pollutants, TACs, and GHGs by encouraging water conservation, limiting GHG emissions from publicly owned treatment works (POTWs), and promoting the use of biogas recovery systems.

Super GHG Measures (SL) are intended to reduce emissions of short lived climate pollutants including methane, black carbon, and fluorinated gases. Many of the SL measure reduction methods are addressed in other sectors of the control strategy such as waste, agriculture, stationary sources, and transportation.

1.3.3 EMISSION REDUCTIONS

The 85 control measures in the 2017 Plan include actions that will be implemented by the Air District and other entities such as the Metropolitan Transportation Commission (MTC), which are expected to result in overall emission reductions of approximately 23,000 pounds per day of ROG, 19,000 pounds per day of NOx, 6,000 pounds per day of PM2.5, and over 16,500 pounds per day of SO_2. In terms of protecting the climate, the 85 control measures are estimated to reduce a minimum of approximately 4.4 million metric tons (MMT) of CO_2e per year by 2030, based on 100-year GWP factors and 5.6 MMT of CO_2e per year by 2030 when based on 20-year GWP factors. These estimates include only those control measures for which potential emissions reductions can be quantified at this time.

The 2017 Plan includes control measures that are implemented by others because they involve activities by other entities that further the same clean air and climate protection goals that the Air District is seeking to achieve under the 2017 Plan. Including them in the Plan serves to provide a comprehensive picture of all such activities throughout the region. These activities by other entities are included for informational purposes only, however. They are not dependent on approval of the 2017 Plan, and the Air District's approval of the 2017 Plan will not authorize or commit those agencies to any action. As these actions and activities by independent entities are not Air District actions and will occur independently of the District's approval of the 2017 Plan, they are not direct or indirect effects resulting from approval of the Plan that must be analyzed in the EIR. Accordingly, Chapter 3 does not address implementation actions by other agencies independent of the Air District's implementation actions under the 2017 Plan

1.4 CHAPTER 3 – ENVIRONMENTAL SETTING, IMPACTS AND MITIGATION MEASURES

Chapter 3 of the Draft EIR describes the existing environmental setting in the Bay Area, analyzes the potential environmental impacts of the 2017 Plan, and recommends mitigation measures (when significant environmental impacts have been identified). The chapter provides this analysis for each of the environmental areas identified in the Initial Study (see Appendix A), including: (1) Air Quality; (2) Climate Change and Greenhouse Gases; (3) Hazards; (4) Hydrology and Water Quality; (5) Noise; (6) Transportation and Traffic; and (7) Utilities and Service Systems. Included for each impact category is a discussion of the environmental setting, significance criteria, whether the 2017 Plan will result in any significant impacts (either from the Plan individually or cumulatively in conjunction with other projects), and feasible project-specific mitigation (if necessary and available).

1.4.1 AIR QUALITY

1.4.1.1 Air Quality Setting

It is the responsibility of the Air District to ensure that State and federal ambient air quality standards are achieved and maintained in its geographical jurisdiction. Health-based air quality standards have been established by California and the federal government for the following criteria air pollutants: ozone, CO, nitrogen dioxide (NO_2), particulate matter (PM10 and PM2.5), sulfur dioxide (SO_2), and lead. These standards were established to protect sensitive receptors with a margin of safety from adverse health impacts due to exposure to air pollution. The State AAQS are more stringent than the federal standards, and in the case of PM10 and SO_2 far more stringent. California has also established standards for sulfate, visibility, hydrogen sulfide, and vinyl chloride.

The Air District is in attainment of the State and federal ambient air quality standards for CO, NOx, and sulfur oxides (SOx). However, the Bay Area is designated as a non-attainment area for the federal and state 8-hour ozone standard. The State 8-hour standard was exceeded on 12 days in 2015 in the Air District; most frequently in the Eastern District (Livermore, Patterson Pass, and San Ramon). The federal 8-hour standard was exceeded on 12 days in 2015. The Air District is unclassified for the federal 24-hour PM10 standard and does not comply with the State 24-hour PM10 standard.

The Air District monitors and maintains a database that contains information concerning emissions of TACs from permitted stationary sources in the Bay Area. This inventory, and a similar inventory for mobile and area sources compiled by CARB, is used to plan strategies to reduce public exposure to TACs. The primary health risk of concern due to exposure to TACs is the risk of contracting cancer. The carcinogenic potential of TACs is a particular public health concern because many scientists currently believe that there are not "safe" levels of exposure to carcinogens without some risk to causing cancer. Based on ambient air quality monitoring, and using OEHHA cancer risk factors, the estimated lifetime cancer risk for Bay Area residents, over a 70-year lifespan from all TACs combined, declined from 4,100 cases per million in 1990 to 690 cases per million people in 2014.

1.4.1.2 Air Quality Impacts

The proposed control strategy for the 2017 Plan consists of eighty-five distinct measures targeting a variety of local, regional and global pollutants. Some measures are expected to reduce the full set of air pollutants and GHGs, while others target a limited subset of pollutants. Implementation of the 2017 Plan is expected to result in a substantial reduction in criteria pollutant emissions, including approximately 23,000 lbs/day of ROG emissions; nearly 19,000 lbs/day of NOx emissions; about 6,000 lbs/day of PM2.5 emissions; over 16,500 lbs/day of SO_2

emissions; and more than 1,500 lbs/day of ammonia emissions. Additional emission reductions are expected due to implementation of the 2017 Plan and related control measures. However, the magnitude of the emissions reductions associated with some of the control measures cannot be estimated at this time.

Implementation of some of the control measures in the 2017 Plan could involve retrofitting, replacing, or installing new air pollution control equipment, changes in product formulations, or construction of infrastructure that have the potential to create air quality impacts. Emissions from one pollutant may increase slightly in order to effectively reduce overall emissions.

Increases in criteria pollutant emissions could also occur as a consequence of efforts to improve air quality. Implementation of the 2017 Plan would result in air emission increases associated with: (1) construction activities (e.g., to install air pollution control equipment); (2) air pollution control technologies that generates air emissions (e.g., new thermal oxidizers); (3) transportation of disposable materials to operate equipment (caustic, ammonia, sodium bicarbonate and waste disposal); and (4) increased electricity demand. As shown in Chapter 3.2, the emission reductions from the 2017 Plan are expected to far outweigh any potential secondary emission increases associated with the 2017 Plan, providing a beneficial impact on air quality and public health. Further, the proposed project would not result in cumulatively considerable impacts because of the large emission reductions.

It is expected that the 2017 Plan control measures would reduce TAC emissions. The basis for this conclusion is that many TACs are also classified as VOCs and the 2017 Plan includes measure that would reduce VOC emissions by an estimated 23,262 lbs/day (4,245 tons/year). To the extent that control measures reduce VOC emissions, it is expected that associated TAC emission reductions could occur as well. Control measures SS25, SS26, and SS27 are expected to reduce VOCs by reducing VOC content of coatings, solvents, lubricants, sealants, adhesives, and printing ink. Ammonia from SCRs could be emitted but would be expected to be controlled through Air District permits that limit ammonia slip to 10 ppm. Control measures for motor vehicles and transportation sources would reduce mobile source emissions, in particular, emissions of diesel particulate from engine exhaust, which is a known carcinogen, and toxic components of gasoline such as benzene and 1,3-butadiene. These mobile source control measures would result in replacing existing vehicles or equipment with more efficient vehicles, zero emission electric vehicles, or hybrid vehicles. If the process being electrified was previously powered by direct combustion of fossil fuels, then electrification is expected to result in an overall decrease in toxic emissions.

1.4.2 GREENHOUSE GAS EMISSIONS

1.4.2.1 Greenhouse Gas Emissions Setting

Global climate change refers to changes in average climatic conditions on the earth as a whole, including temperature, wind patterns, precipitation and storms. Global warming, a related concept, is the observed increase in the average temperature of the earth's surface and atmosphere. One identified cause of global warming is an increase of GHGs in the atmosphere.

The six major GHGs identified by the Kyoto Protocol are CO_2, methane (CH_4), nitrous oxide (N_2O), sulfur hexafluoride (SF_6), haloalkanes (HFCs), and perfluorocarbons (PFCs), plus black carbon.

It is the increased accumulation of GHGs in the atmosphere that may result in global climate change. Climate change involves complex interactions and changing likelihoods of diverse impacts. Due to the complexity of conditions and interactions affecting global climate change, it is not possible to predict the specific impact, if any, attributable to GHG emissions associated with a single project, which is why GHG emission impacts are considered to be a cumulative impact.

Transportation sources generate approximately 40 percent of the total GHG emissions in the District. The remaining 60 percent of the total District GHG emissions are from stationary and area sources. Under "business as usual" conditions, GHG emissions are expected to grow in the future due to population growth and economic expansion.

1.4.2.2 Greenhouse Gas Emissions Impacts

The proposed control strategy for the 2017 Plan consists of eighty-five distinct measures targeting a variety of local, regional and global pollutants. Some measures are expected to reduce the full set of air pollutants and GHGs, while others target a limited subset of pollutants. Estimating the emissions reductions of the control strategy is complicated by the fact that various control measures affect numerous emission sources, and a wide variety of implementation actions are employed. In addition, the outcome of certain implementation actions (such as pursuing partnerships and collaborations, promoting adoption of model ordinance and best practices by local agencies, legislative advocacy, and public outreach and education) are difficult to quantify. The expected GHG emission reductions that can be estimated at this time from the 2017 Plan are up to 5.6 million metric tons of CO_2 equivalent (CO_2e) emissions.

Increases in GHG emissions could also occur as a consequence of efforts to improve air quality. Implementation of the 2017 Plan would result in GHG emission increases associated with: (1) construction activities (e.g., to install air pollution control equipment); (2) air pollution control technology that generates GHG emissions (e.g., dry sorbent injection at coke calcining facilities and new thermal oxidizers); (3) transportation of materials to operate equipment (caustic, ammonia, sodium biocarbonate and waste disposal); and (4) increased electricity demand.

As shown in Chapter 3.3, the emission reductions from the 2017 Plan are expected to far outweigh any potential secondary emission increases associated with the 2017 Plan, providing a beneficial impact on climate change. The GHG analysis is cumulative in nature. Since the 2017 Plan provides a GHG emission benefit (i.e., GHG emission reduction), the GHG emissions impacts on climate change from the 2017 Plan are not cumulatively considerable.

1.4.3 HAZARDS AND HAZARDOUS MATERIALS

1.4.3.1 Hazards and Hazardous Materials Setting

The potential for hazards exist in the production, use, storage and transportation of hazardous materials. Hazardous materials may be found at industrial production and processing facilities. Some facilities produce hazardous materials as their end product, while others use such materials as an input to their production process. Examples of hazardous materials used as consumer products include gasoline, solvents, and coatings/paints. Hazardous materials are stored at facilities that produce such materials and at facilities where hazardous materials are a part of the production process. Currently, hazardous materials are transported throughout the district in great quantities via all modes of transportation including rail, highway, water, air, and pipeline.

The potential hazards associated with industrial activities are a function of the materials being processed, processing systems, and procedures used to operate and maintain the facility. The hazards that are likely to exist are identified by the physical and chemical properties of the materials being handled and their process conditions and include: (1) toxic gas clouds due to releases of volatile chemicals; (2) fires or explosions; (3) thermal radiation from the heat generated by a fire; and (4) explosion and overpressure when vessels containing flammable explosive vapors and potential ignition sources are combined.

In 2015, there were a total of 1,272 hazardous materials incidents reported in the nine counties regulated by the Air District, with the most incidents (292) reported in Alameda County. Hazardous materials incidents during transportation, at waterways, and at commercial facilities were the most common locations, respectively, for hazardous materials incidents. About 17 percent of the hazardous materials incidents that occurred within California occurred within the nine counties that comprise the Bay Area, with spills in industrial areas the most common (27 percent), followed by waterways (22 percent) and commercial areas (20 percent).

1.4.3.2 Hazards and Hazardous Materials Impacts

Control measures have the potential to create hazards and hazardous materials impacts. Control measures that would regulate VOC emissions by establishing VOC content requirements for products such as coatings may result in formulating these products with materials that are low or exempt VOC materials. Such reformulated products could have increased hazardous physical or chemical properties compared to the products that are currently being used, which could increase hazards through routine transport of disposal or through upset conditions involving an accidental result of these materials into the environment. Control measures that could require a control device to be installed may increase the hazards or release at industrial facilities due to failure of the control equipment, which would then create an increase in potential hazard impacts in the event of an accidental release of hazards materials into the environment (such as ammonia and caustic). Hazards could also be generated by the conversion of gasoline-fueled mobile sources to alternative fuels such as natural gas and propane, etc.

The 2017 Plan is not expected to introduce any new hazards into the Bay Area and the impacts on hazards and hazardous materials are less than significant. The 2017 Plan is expected to result in minimal hazard impacts and the reduction in use of fossil fuels is expected to reduce hazards associated with its use. Therefore, hazards and hazardous materials impacts associated with the 2017 Plan are not significant, are not cumulatively significant and would not make a considerable contribution to cumulatively significant hazards/hazardous materials impact. The Air District concludes that the 2017 Plan will not result in any significant hazards or hazardous materials impacts, individually or cumulatively.

1.4.4 HYDROLOGY AND WATER QUALITY

1.4.4.1 Hydrology and Water Quality Setting

The District is within the San Francisco Bay Hydrologic Region (Bay Region) which includes all of San Francisco County and portions of Marin, Sonoma, Napa, Solano, San Mateo, Santa Clara, Contra Costa, and Alameda counties. It occupies approximately 4,500 square miles; from southern Santa Clara County to Tomales Bay in Marine County; and inland to near the confluence of the Sacramento and San Joaquin rivers at the eastern end of Suisun Bay. The eastern boundary follows the crest of the Coast Ranges, where the highest peaks are more than 4,000 feet above mean sea level.

The most prominent surface water body in the Bay Region is San Francisco Bay itself. Other surface water bodies include: Creeks and rivers; ocean bays and lagoons (such as Bolinas Bay and Lagoon, Half Moon Bay, and Tomales Bay); urban lakes (such as Lake Merced and Lake Merritt); human-made lakes and reservoirs (such as Lafayette Reservoir, Briones Reservoir, Calaveras Reservoir, Crystal Springs Reservoir, Kent Lake, Lake Chabot, Lake Hennessey, Nicasio Reservoir, San Andreas Lake, San Antonio Reservoir, San Pablo Reservoir, Upper San Leandro Reservoir, Anderson Reservoir, and Lake Del Valle).

The Bay Area relies on imported water, local surface water, and groundwater for water supply. Local supplies account for about 30 percent of the total, and the remaining supply is imported from the State Water Project (SWP), Central Valley Project (CVP), and the Mokelumne and Tuolumne watersheds. In 2010, water demand in the region was 1,278,480 acre-feet per year (af/yr)[1]. Demand is projected to grow to 1,680,963 af/yr in a normal year, and 1,666,870 af/yr in a single dry year by 2035.

Some water agencies in the region have imported water from the Sierra Nevada for nearly a century to supply customers. The East Bay Municipal Utility District (EBMUD) and San Francisco Public Utilities Commission (SFPUC) import surface water into the Bay Region from the Mokelumne and Tuolumne rivers via the Mokelumne and Hetch Hetchy aqueducts, respectively. Water from these two rivers accounts for approximately 38 percent of the average annual water supply in the Bay Area. Water from the Sacramento-San Joaquin Delta (Delta), via the federal CVP and the SWP, accounts for another 28 percent. Approximately 31 percent of the average annual water supply in the Bay Area comes from local groundwater and surface water;

[1] One acre-foot of water is equal to approximately 325,851 gallons.

and three percent is from miscellaneous sources such as harvested rainwater, recycled water, and transferred water.

It is expected that water demand management measures, combined with alternative resources and strategies, and regulatory requirements will allow Bay Area water agencies to continue to meet projected demand through 2035 in average years. Normal year shortfalls are not projected, however in dry years all but four major agencies – Marin Municipal Water District, City of Napa, SFPUC and Zone 7 - project a shortfall. Without strong local and regional planning, most Bay Area Region water agencies could experience future supply shortfalls in severe droughts. The 2006 Bay Area Integrated Regional Water Management Plan identified 43 potential recycled water projects that could be implemented by the year 2020. The potential market for recycled water is estimated to be 240,000 acre-feet per year by 2025. The region increased its recycled water use over 36 percent from 29,500 acre-feet in 2001 to 40,300 acre-feet in 2009. The largest use of recycled water is for landscape irrigation including golf courses, wetlands, industrial uses, and agricultural irrigation.

Wastewater treatment in the Bay Area is provided by various agencies as well as individual city and town wastewater treatments. The total wastewater treatment capacity in the Counties of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano and Sonoma of 1,216.34 million gallons per day, with an estimated excess capacity of 500.55 million gallons per day.

1.4.4.2 Hydrology and Water Quality Impacts

Some control measures have the potential to create hydrology and water quality impacts. Control measures that would control PM and/or SOx emissions could require additional water from dust suppression, air emission control equipment (such as wet gas scrubbers or for dust control). Control measures that encourage the planting of trees/plants could also generate an increase in water use, although other measures are aimed at encouraging water conservation and may reduce water use. Control measures that promote the use of alternative fuels have the potential to create water quality or groundwater quality impacts in the event of accidental release of alternative fuels during transport, storage, and handling. To reduce VOC emissions, some proposed control measures may involve reformulating products such as architectural coatings with low VOC or exempt solvents. The EIR evaluated the potential for stationary source measures to generate adverse water quality impacts from add-on air pollution control equipment such as wet scrubbers, alternative transportation fuels and reformulated low-VOC consumer products.

Water demand impacts from installing most types of air pollution control equipment that use water as part of the control process would not create water demand impacts that exceed the applicable water demand significance thresholds. Implementation of the 2017 Plan includes a number of control measures aimed at reducing PM2.5 emissions which are expected to lead to the installation of a wet gas scrubber (WGS) at refineries and sulfuric acid plants. The water demand impacts from installing one WGS at a large facility (e.g., refinery) would exceed applicable water demand significance thresholds and, therefore, water demand impacts are concluded to be significant. It should be noted that the objective of several control measures the 2017 Plan is to reduce water use by determining best practices to reduce water consumption; increase water recycling; encourage the adoption of water conservation ordinances; and develop public outreach and education programs on water conservation. Due to the voluntary nature of these control measures, estimating potential water demand reductions would rely on many assumptions and speculation, and is not possible at this time.

The potential increase in the volume of wastewater estimated as a result of implementing the control measures in the 2017 Plan is expected to be limited to air pollution control equipment that utilizes water for control (e.g., ESPs and WGS). Industrial facilities that could potentially use ESPs and WSGs are expected to be relatively large facilities that maintain and operate wastewater treatment facilities under the requirements of Industrial Wastewater Discharge Permits (IWDP) or National Pollutant Discharge Elimination System (NPDES) permits. While the installation of an ESP or WGS would likely increase the wastewater generated from a facility, the wastewater would be required to be treated by the industrial facility prior to discharge and the wastewater is not expected to be discharged to public wastewater treatment plants. Facilities may be required to modify existing wastewater discharge permits. However, the discharge of wastewater under an approved discharge permit is expected to minimize the potential for significant water quality impacts. It is likely that wastewater permit modifications for large facilities (e.g., refineries) would not be required as these facilities operate wastewater treatment facilities and generate large amounts of wastewater on a daily basis.

The impacts of installing air pollution control equipment to comply with potential future emission reduction requirements that may be required to comply with control measures in the 2017 Plan are not expected to exceed any applicable water quality significance thresholds and, therefore, are concluded to be less than significant.

Because it was concluded that potential future water demand impacts from the proposed project would be significant, mitigation measures for water demand are required. Mitigation Measure HWQ-1 would require the use of recycled water if available to satisfy the water demand for air pollution control equipment. Mitigation Measure HWQ-2 requires the operator to submit a written declaration as part of the application for an Authority to Construct if recycled water is not available, signed by the water purveyor indicating the reasons why recycle water cannot be supplied to the project. In spite of implementing the above water demand mitigation measures, water demand impacts remain significant as recycled water may not be available in all cases.

1.4.5 NOISE

1.4.5.1 Noise Setting

The existing noise environment in the Bay Area can be broken down into transportation sources, and stationary/other sources. Transportation sources include motor vehicle traffic on roadways, railroad operations such as light rail and commuter trains, and aircraft operations. Traffic is the predominant noise source in many parts of the San Francisco Bay Area. Traffic noise exposure is primarily a function of the volume of vehicles, the speed of those vehicles, the number of those vehicles that are medium and heavy trucks, the time of day (i.e., daytime vs. nighttime), and the proximity of noise-sensitive receivers to the roadway.

Stationary/other sources are non-transportation sources such as industrial equipment, construction equipment, commercial operation, and any other sources not associated with the transportation of people or goods. A variety of stationary noise sources are located within the Bay Area. These include manufacturing plants, landfills, treatment plants (e.g., water), power generation facilities, food packaging plants, lumber mills, and aggregate mining facilities, just to name a few. Noise generated by these sources varies widely but can often be a significant if not dominant contributor to the noise environment at a given location.

1.4.5.2 Noise Impacts

The District found in the Initial Study that the installation of new or replacement equipment, including air pollution controls, for stationary sources would not have significant noise impacts, because these activities would principally occur at industrial facilities such as refineries, power plants, and other similar facilities located in areas that are zoned for industrial uses and do not have sensitive noise receptors. As a result, no noise impacts are anticipated from the regulatory actions proposed as part of the 2017 Plan.

It is anticipated that some of the grants and incentives control measures in the 2017 Plan would could affect the number, type, and concentration of vehicles circulating within the Bay Area. For example, the District may provide funds for shuttle or feeder routes to provide connections to transit hubs, which would add shuttle buses, vans, or other similar vehicles to local roadways. The District could also provide funds to support changes in the types of vehicles currently on the road, for example by funding an upgrade to lower-emission vehicles and heavy duty trucks. Additionally, some projects could affect travel patterns that could increase or decrease the number of vehicles on the roads, or affect the location and concentration of vehicle traffic. For example, projects promoting alternatives to automobile travel may reduce vehicle traffic in certain areas, while roadway modifications such as reducing automobile lanes to add bicycle lanes to a roadway could cause automobile traffic to shift to other routes, or to become more concentrated on certain routes. All of these actions have the potential to affect noise levels in the areas where they take place, at least to a certain degree.

In addition, some of the activities associated with the grants and incentive programs could result in construction activities. Construction equipment can generate significant noise levels, but the amount generated by specific types of equipment can vary greatly. Depending on the nature and location of the construction noise, and when it occurs, noise could have the potential to exceed the levels allowed by applicable noise ordinances, which would constitute a significant impact.

At this point, however, no specific projects have been proposed for grant or incentive funding from the 2017 Plan. When specific projects are proposed for funding through the Air District's grants and incentive programs, those projects will be required to comply with applicable noise requirements, such as Caltrans' Standard Specifications and Standard Special Provisions and local city and county noise ordinances. In most if not all cases, implementation of these requirements should reduce the potential impact of construction noise to a less than significant level. Because the specific projects that would be funded are not known, the features of these projects that would affect noise levels also are not known and their potential noise impacts are considered to be speculative at this time.

1.4.6 TRANSPORTATION AND TRAFFIC

1.4.6.1 Transportation and Traffic Setting

The Bay Area features a large and complex transportation network, allowing for multimodal access across the region. The transportation system includes interstate and state highways, local arterial roadways, local streets and roads, public transit systems, bicycle and pedestrian facilities, seaports, and airports; when combined, these facilities allow for the movement of people and goods throughout the region.

The Bay Area currently contains over 1,300 directional miles of limited-access highways, which include both interstates and state highways. In addition, the Bay Area has over 33,000 directional miles of arterials and local streets, providing more localized access to individual communities. Together, these roadway facilities accommodate nearly 17 million vehicle trips a day which results in approximately: (1) 149 million miles of vehicle travel per day; (2) 374,000 hours of traffic delay; and (3) 23.6 million trips per day.

There are over 11,500 transit route miles of service including heavy rail (Bay Area Rapid Transit or BART), light rail (Muni Metro and Santa Clara Valley Transportation Authority Light Rail), commuter rail (Caltrain and Altamont Commuter Express), diesel and electric buses, cable cars, and ferries. Transit in the Bay Area accommodates almost 1.6 million boardings per day, primarily through four major operators.

The Bay Area is served by five seaports, which provide the opportunity for intermodal transfers to trucks and railcars. The Port of Oakland, the largest of the five, is the third largest U.S. seaport on the West Coast (after the Ports of Los Angeles and Long Beach). Other seaports include the Port of San Francisco; the Port of Richmond; the Port of Benicia; and the Port of Redwood City. The Bay Area is also served by three major international airports: San Francisco International Airport (SFO); Oakland International Airport (OAK); and Norman Y. Mineta San José International Airport (SJC), as well as numerous smaller general aviation airports.

1.4.6.2 Transportation and Traffic Impacts

As discussed in the Initial Study, implementation of the 2017 Plan is not expected to substantially increase vehicle trips or vehicle miles traveled in the Bay Area and the control measures could ultimately provide transportation improvements and congestion reduction benefits. Therefore, traffic associated with operational activities in the 2017 Plan were determined to be less than significant in the Initial Study. However, some control measures could result in construction associated with rail and truck routes/corridors and generate traffic along heavily travelled roadways. Construction activities may result in temporary reduction in the level of service; major roadway or arterial closures; temporary closure of railroad lines; temporary impact on businesses or residents within or near a construction area; removal of parking; and conflicts with the public transportation system. These potential impacts were evaluated in subsection 3.7 and found to be less than significant.

1.4.7 UTILITIES AND SERVICE SYSTEMS

The BAAQMD covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. Given the large area covered by the BAAQMD, public utilities are provided by a wide variety of local agencies.

1.4.7.1 Utilities and Service Systems Setting

1.4.7.1.1 Electricity

Power plants in California provided approximately 66 percent of the total in-state electricity demand in 2015; of which 24.5 percent came from renewable sources such as biomass, solar, and wind power. The Pacific Northwest provided another 13 percent of total electricity demand and the remaining 21 percent was imported from the Southwest. The total system power used in California in 2015 was 295,405 gigawatt-hour.

The majority of power generated in the Bay Area comes from plants located in Contra Costa County. The Pittsburg Generating Station, Delta Energy Center, and Marsh Landing Generating Center are the three largest power plants within BAAQMD jurisdiction, providing 1302, 860, and 828 MW respectively and are fueled primarily by natural gas. There are three additional facilities that produce over 500 megawatts (MW); the Russel City Energy Company Facility in Alameda (640 MW), the Gateway Generating Station located in Contra Costa (613 MW), and the Los Medanos Energy Center (594 MW). Pacific Gas and Electric (PG&E) is the primary supplier of electricity to the Bay Area.

1.4.7.1.2 Solid/Hazardous Wastes

There are three primary classes of landfill sites permitted to receive waste materials. Class I sites are facilities that can accept hazardous waste as well as municipal solid waste, construction debris, and yard waste. Class II sites may receive certain designated waste along with municipal solid waste, construction debris, and yard waste. Class III sites can only accept non-hazardous waste, e.g., solid waste construction debris, wood and yard waste, and certain non-hazardous industrial waste. A total of 15 Class III active landfills are located within the Air District with a total capacity of 44,296 tons per day.

There are no hazardous waste disposal sites within the Bay Area. Hazardous waste generated at area facilities, which is not reused on-site, or recycled, is disposed of at a licensed in-state hazardous waste disposal facility. Two such facilities in California are the Chemical Waste Management Kettleman Hills facility in King’s County, and the Laidlaw Environmental Services facility in Buttonwillow (Kern County). Hazardous waste can also be taken to out-of-state facilities for treatment/disposal.

The most common types of hazardous waste generated in the district include contaminated soils, waste oil and mixed oil, inorganic solid waste, organic solids, asbestos-containing waste, and unspecified oil-containing wastes. San Francisco generates the major portion of the hazardous waste generated in the Air District followed by Alameda County with contaminated soils being the most common hazardous waste generated in those two counties.

1.4.7.2 Utilities and Service Systems Impacts

1.4.7.2.1 Electricity

Implementation of the 2017 Air Plan would result in the installation of additional air pollution control equipment that would increase electricity use including installation of new air pollution control equipment, as well as electrification of specific control measures (e.g., lawn care equipment and shore power for vessels at berth). The projected increase in electricity associated with implementation of the 2017 Plan is estimated to be 0.7 million kWh. The estimated baseline electricity use in the Bay Area is 54,371 million kWh. The increased use of electricity is approximately 0.0012 percent of the existing electricity demand in the Bay Area. It should be noted that some of the other stationary sources own/operate cogeneration units and generate electricity onsite which would help minimize impacts to electricity providers. In addition, electricity providers are moving towards compliance with California's renewables portfolio standard (RPS) and generate 50 percent of their electricity from renewable energy resources by 2030 so modifications to existing electricity generating facilities and new generating facilities are expected to be implemented in the near future to comply with state RPS regulations.

It should also be noted that in addition to control measures that may result in an increase in electricity, the 2017 Plan also includes a number of measures that are aimed at energy efficiency and are expected to result in decreases in electricity use including: BL1 – Green Buildings; BL2 – Decarbonize Buildings; BL4 – Heat Island Mitigation; and EN2 - Decrease Electricity Demand. The method in which these control measures would be implemented is speculative and the potential energy benefits are unknown so no electricity reduction is assumed from these control measures at this time.

1.4.7.2.2 Solid/Hazardous Wastes

Solid or hazardous wastes that may be generated from construction-related activities would consist primarily of materials from the demolition of existing air pollution control equipment and construction associated with new or modified air pollution control equipment. Construction-related waste would be disposed of at a Class II (industrial) or Class III (municipal) landfill. There are 15 Class III landfills within the Bay Area. Based on a search of the Cal Recycle's (formerly the California Integrated Waste Management Board) Solid Waste Information System (SWIS), the landfills that accept construction waste in the Bay Area have a combined disposal capacity of approximately 44,296 tons, which is expected to be sufficient capacity to handle the one-time waste that may be generated from construction activities.

Due to the recycling value of the materials involved, the increased use of electric or hybrid vehicles and subsequent generation of batteries and other types of waste from air pollution control technology and devices (e.g., catalysts) were found to result in less than significant impacts. This is because the amount of solid and hazardous waste generated is minimal and not expected to exceed the capacity of designated landfills.

1.5 CHAPTER 4 – ALTERNATIVES ANALYSIS

This Program EIR provides a discussion of alternatives to the proposed project as required by CEQA. Pursuant to the CEQA guidelines, alternatives should include realistic measures to attain the basic objectives of the proposed project but would avoid or substantially lessen any of the significant effects of the project, and provide means for evaluating the comparative merits of each alternative (CEQA, Guidelines, §15126.6(a)). In addition, though the range of alternatives must be sufficient to permit a reasoned choice, they need not include every conceivable project alternative (CEQA Guidelines §15126.6(a)). The key issue is whether the selection and discussion of alternatives fosters informed decision making and public participation. An EIR need not consider an alternative whose effect cannot be reasonably ascertained and whose implementation is remote and speculative (CEQA Guidelines, §15126.6(f)(3). A total of three alternatives were evaluated in the Program EIR.

Alternative 1 – No Project Alternative: CEQA requires the evaluation of the No Project Alternative, which consists of what would occur if the proposed project was not approved; in this case, not adopting the 2017 Plan. The net effect of not adopting the 2017 Plan would be a continuation of the 2010 CAP and noncompliance with the California Clean Air Act.

Alternative 2 – Ozone Control Only: Under this alternative, only those portions of the 2017 Plan and its control measures that are required in order for the Air District to comply with the California Clean Air Act requirements for ozone would be implemented. Control measures addressing particulate matter, toxic air contaminants and greenhouse gases would not be implemented. These include numerous proposed new or revised Air District rules to reduce SO_2 emissions (SS5, SS6, SS7, SS24); particulate matter emissions (SS31, SS33-SS38); diesel particulate matter and black carbon emissions from backup generators (SS32); and greenhouse gas emissions (SS12, SS14, SS16, SS18). In addition, this alternative would also not include a number of technical support, educational, and advocacy efforts, particularly those targeting greenhouse gas reductions. These would include, for example, AG2 to promote implementation of biogas recovery facilities at farms; NW1 and NW3 to encourage carbon sequestration in rangelands and wetlands; and WA4 to develop model ordinances for zero waste and recycling of demolition and construction debris.

Alternative 3 – Criteria Pollutant Control Only: This alternative is wider in scope than the ozone control only approach presented as Alternative 2, in that it includes all criteria pollutants. As a result, the only programs that are not included in this alternative are those which relate to toxic air contaminants and greenhouse gases. Regulatory actions proposed in the 2017 Plan to reduce toxic air contaminants (SS20, SS21, and SS32), odors (SS40), and greenhouse gas emissions (SS12, SS15, SS16, and SS17) would not be included in the Criteria Pollutant Only Alternative. A number of technical support, educational and advocacy efforts would also not be anticipated under this alternative, including those to support water conservation, address short-lived climate pollutants, and monitor greenhouse gas emissions.

1.5.1 ALTERNATIVES ANALYSIS SUMMARY

The alternatives to the proposed 2017 Plan are limited by the nature of the project. The 2017 Plan is a multi-pollutant air quality plan that also fulfills California Clean Air Act (CCAA) requirements for an ozone attainment plan. The alternatives are constrained by the state requirement for an updated ozone attainment plan. With this in mind, this EIR analyzes three alternatives to the 2017 Plan. One is the no project alternative, which is required to be assessed under CEQA in order to provide decision-makers with a realistic view of what would occur if the project were not approved. The second alternative would be to simplify the plan, removing the multi-pollutant component and focusing on the state requirements for controlling ozone. The third alternative takes a slightly broader approach and addresses all criteria pollutants, including ozone.

Each of these three alternatives is analyzed in terms of air quality impacts, greenhouse gas emissions, hazards and hazardous materials, hydrology and water quality, noise, transportation and traffic, and utilities and service systems. While Alternative 2 would generate the least severe and fewest environmental impacts, Alternative 2 would also provide less emission reductions for SO_2, $PM_{2.5}$ and GHGs than the 2017 Plan. Compared to the other project alternatives, Alternative 2 would not achieve some of the critical project objectives such as demonstrating attainment with the $PM_{2.5}$ standards. Other project objectives that would not be achieved under Alternative 2 include reducing ambient concentrations of TACs and reducing the Bay Area GHG emissions, or applying BARCT and implementing all feasible measures through an expeditious implementation schedule. As a result, the 2017 Plan is the preferred alternative.

1.6 CHAPTER 5 – OTHER CEQA TOPICS

Chapter 5 of this Program EIR includes discussions of several topics which are mandated under CEQA. These include 1) whether the project will provide short-term environmental benefits while ignoring or increasing long-term environmental costs or impacts; 2) whether the project could result in significant irreversible environmental changes; and 3) whether the project could have growth-inducing impacts.

The analysis in Chapter 5 finds that the 2017 Plan will not provide short-term environmental benefits at the expense of long-term environmental costs. In addition, adoption of an updated Clean Air Plan/Regional Climate Protection Strategy is not anticipated to produce significant irreversible environmental changes or growth-inducing impacts.

1.7 CHAPTER 6 – REFERENCES, AND CHAPTER 7 – ACRONYMS

Chapter 6 provides the references and Chapter 7 provides the acronyms for the 2017 Plan Program EIR.

1.8 SUMMARY OF ENVIRONMENTAL IMPACTS, MITIGATION MEASURES, AND RESIDUAL IMPACTS

Table 1-1 below provides an overview of the impacts discussed in the body of this Program EIR, together with any mitigation measures and residual impacts.

TABLE 1-1

Summary of Environmental Impacts, Mitigation Measures and Residual Impacts

Impact	Mitigation Measures	Residual Impacts
Air Quality		
The estimated criteria pollutant emission reductions from the 2017 Plan are expected to far outweigh any potential secondary emission increases associated with the 2017 Plan, providing a beneficial impact on air quality.	None required.	Air quality impacts are less than significant.
It is expected that the 2017 Plan control measures would result in an overall reduction in toxic air contaminant emissions.	None required.	Emissions of toxic air contaminants would be less than significant.
A detailed analysis of potential localized air quality impacts for particulate matter and toxic air contamiants is not possible due to a lack of specificty on how compliance with future control measure regulations would occur. Impacts are considered to be speculative per CEQA Guidelines Section 15145.	None required.	Localized emission impacts are speculative.
Greenhouse Gas Emissions		
The estimated GHG emission reductions from the 2017 Plan are expected to far outweigh any potential GHG emission increases associated with the 2017 Plan, providing a beneficial impact on climate change.	None required.	GHG emissions are expected to remain less than significant.
Hazards and Hazardous Materials		
Hazard impacts associated with the use and transport of hazardous materials for new air pollution control equipment are expected to be less than significant assuming the use of aqueous ammonia in SCRs.	None required.	Hazards impacts from use of new air pollution control equipment are less than significant.

Impact	Mitigation Measures	Residual Impacts
Increase use and transportation of alternative fuels are expected to be less than significant.	None required.	Hazards associated with the use of alternative fuels are approximately equivalent or less compared to conventional fuels, therefore are expected to remain less than significant.
Hydrology and Water Quality		
The potential future water demand created by the need for new air pollution control equipment, particularly wet gas scrubbers, would result in a significant impact on water demand.	HWQ-1: When air pollution control equipment is installed and water is required for its operation, the operator shall use recycled water, if available, to satisfy the water demand for the air pollution control equipment. HWQ-2: In the event that recycled water cannot be delivered to the affected facility, the operator shall submit a written declaration with the application for an Authority to Construct permit for the air pollution control equipment, to be signed by an official of the water purveyor indicating the reason(s) why recycled water cannot be supplied to the project.	Water demand impacts are expected to remain significant.
Wastewater generated from the installation of air pollution control equipment to comply with potential future emission reduction requirements are not expected to exceed any applicable water quality significance thresholds. Therefore, no wastewater impacts are expected.	None required.	Wastewater impacts are expected to remain less than significant.

Impact	Mitigation Measures	Residual Impacts
Noise		
Noise impacts, individually or cumulatively, associated with implementation of the 2017 Plan are not expected to be significant.	None required.	Noise impacts associated with the 2017 Plan are expected to be less than significant.
Transportation and Traffic		
Construction and operational trips associated with implementation of the stationary source measures are not expected to generate additional traffic associated with the long-term operation of new equipment that may be required. The potential traffic impacts associated with other control measures (non-stationary source measures) are speculative.	None required.	Traffic impacts were determined to be less than significant.
Utilities and Service Systems		
The increase in electricity is expected to be much less than one percent of the existing electrical demand and is not expected to exceed the current capacity of the electric utilities in the Bay Area. The 2017 Plan impacts on electricity supply are less than significant.	None required.	Electricity impacts associated with the 2017 Plan are expected to remain less than significant.
Solid and hazardous waste impacts due to implementation of the 2017 Plan are expected to be less than significant.	None required.	Solid and hazardous waste impacts associated with the 2017 Plan are expected to remain less than significant.

CHAPTER 2 PROJECT DESCRIPTION

2.0 PROJECT DESCRIPTION

2.1 INTRODUCTION

The Bay Area Air Quality Management District (Air District), in partnership with the Association of Bay Area Governments (ABAG), the Bay Area Conservation and Development Commission, and the Metropolitan Transportation Commission (MTC), is preparing the 2017 Clean Air Plan/Regional Climate Protection Strategy (2017 Plan). The 2017 Plan will be a roadmap for the Air District's efforts over the next few years to reduce air pollution and protect public health and the global climate. The 2017 Plan is required by the California Clean Air Act (CAA) to identify potential rules, control measures, and strategies for the Bay Area to implement in order to meet state standards for ozone. In addition, the 2017 Plan update will include the Bay Area's first comprehensive Regional Climate Protection Strategy, which will identify potential rules, control measures, and strategies that the Air District can pursue to reduce greenhouse gases in the Bay Area. The proposed 2017 Plan provides a strategy for reducing emissions of ozone precursors, greenhouse gases, particulate matter, and/or toxic air contaminants in the Bay Area.

Within the past decade, the concept of planning on a multi-pollutant basis, rather than on a pollutant by pollutant basis, has been embraced. The Air District took a step forward in its air quality planning by using an integrated, multi-pollutant approach for the Bay Area 2010 Clean Air Plan (CAP) which focused on reducing emissions of air pollutants that are most harmful to public health. The 2017 Plan again employs a multi-pollutant approach that addresses the most important air pollutants for purposes of protecting public health and protecting the climate. The 2017 Plan also serves to update the most recent Bay Area ozone plan, the 2010 CAP, in compliance with the California CAA requirements for regional air districts that do not attain State ozone standards.

Ozone is the principal component of photochemical "smog." Ozone is highly reactive, and at high concentrations near ground level, can be harmful to public health. The 2017 Plan is a strategy to address progress of the 2010 CAP, implement additional control measures for emission reductions, and ensure that the region continues progress to attain State ozone standards.

Ozone is not directly emitted from pollution sources. Rather, ozone is formed in the atmosphere through complex chemical reactions between hydrocarbons (also known as "reactive organic gases" or "volatile organic compounds"), and nitrogen oxides, in the presence of sunlight. Ozone levels are typically at the highest on hot, windless summer afternoons, especially in inland valleys.

Ozone can damage the tissues of the lungs and respiratory tract. High concentrations of ozone can irritate the nose, throat, and respiratory system, as well as constrict airways. Ozone is also known to aggravate respiratory conditions such as asthma, bronchitis, and emphysema. Repeated exposure to high ozone levels can make people more susceptible to respiratory infection and lung inflammation, and permanently damage lung tissue. Children are most at risk as they are active outdoors in the summer, when ozone levels are typically highest. Seniors and people with respiratory illnesses are also especially sensitive to ozone's effects. Even healthy adults, working or exercising outdoors during high ozone levels, can be affected. Ozone also damages trees, agricultural crops, and other plants.

The California and national governments have established ambient air quality standards (AAQS) for ground level ozone (and other air pollutants) that are intended to protect human health from ozone's adverse effects. Air quality standards define the maximum amount of a pollutant that can be present in outdoor air without harm to public health. The standards are generally set at levels low enough to protect even the most sensitive individuals in area communities. National ambient air quality standards are set by the U.S. EPA, while State standards are set by the California Air Resources Board (ARB).

The Air District operates a network of air quality monitoring stations throughout the region to constantly monitor air quality conditions. Data from the air monitoring stations allows the Air District to determine whether the region meets State and national ambient air quality standards and to track progress in improving air quality.

The one-hour national ambient air quality standard for ozone is 0.12 parts per million (ppm). The California one-hour ozone standard is more stringent than the national standards, and is set at 0.09 ppm. An exceedance of the national or State standard occurs if and when ozone concentrations at any District monitoring station equal or exceed the national or State standard, respectively, over a one-hour period. The national one-hour ozone standard was revoked by the U.S. EPA on June 15, 2005.

The 8-hour national ozone standard was revised downward in 2015 to 0.070 ppm which is the same as the State 8-hour ozone standard. The determination of whether or not a region attains the 8-hour national standard is based on the three-year average of the annual 4th highest daily maximum 8-hour ozone concentration. The national 8-hour standard is considered to be more health protective than the one-hour standard because it protects against health effects that occur with longer exposure to lower ozone concentrations. Based upon current modeling data, it is likely that the Air District will be designated as non-attainment in 2017 when the U.S. EPA completes the process to designate the attainment status for each air basin under the revised 0.070 ppm 8-hour national standard. As discussed below the Air District is also classified as non-attainment for the State 8-hour ozone standard.

2.2 BACKGROUND

The California CAA requires regions that do not meet the State ambient air quality standards to prepare Plans for attaining the standards, and to update these Plans every three years. In summary, these Plans must include estimates of current and future emissions of the pollutants that form ozone, and a control strategy, including "all feasible measures," to reduce these emissions. The Plans must also address the transport of air pollutants to certain neighboring regions.

The first Bay Area Plan for the State ozone standards was the 1991 Clean Air Plan. Subsequently, the Clean Air Plan was revised in 1994, 1997, 2000, 2005, and 2010. Each of these Plans proposed additional measures to reduce emissions from a wide range of sources, including industrial and commercial facilities, motor vehicles, and "area sources." The 2010 CAP is the most recent adopted Plan for the Bay Area to achieve the State ozone standards.

The 2017 Plan will provide a multi-pollutant approach to air quality planning in the Bay Area. The multi-pollutant Plan addresses ozone precursors, greenhouse gases, particulate matter (PM), and/or toxic air contaminants (TACs), via an integrated control strategy that identifies co-benefits and disbenefits of the control strategy on each of the pollutants.

The San Francisco Bay Area air basin is designated as a non-attainment area for both the California 1-hour ozone standard and the California 8-hour ozone standard. Because ozone is formed through chemical reactions between reactive organic gases (ROG) and nitrogen oxides (NOx) in the presence of sunlight, efforts to reduce ozone seek to limit emissions of ROG and NOx into the atmosphere. In general, ROG comes from evaporation or incomplete combustion of fuels, from the use of solvents in cleaning operations and in paints and other coatings, and in various industrial and commercial operations. NOx is produced through combustion of fuels by mobile sources – cars, trucks, construction equipment, locomotives, aircraft, marine vessels – and stationary sources such as power plants and other industrial facilities.

Exceedances of the California and national ozone standards in the Bay Area have decreased significantly with the regulation and reduction of ozone precursor emissions (i.e., ROG and NOx). This improvement is due to State and national regulations requiring cleaner motor vehicles and fuels, District regulations requiring reduced emissions from industrial and commercial sources, as well as programs to reduce the use of motor vehicles.

Greenhouse gases (GHG) refer to gases that contribute to global warming. In addition to negative impacts on air quality as higher temperatures contribute to increased levels of ozone and PM, climate change may cause a wide range of ecological, social, economic, and demographic impacts at both the global and the local scale. The 2017 Plan will seek to maximize reductions of greenhouse gases, primarily carbon dioxide (CO_2) and methane, in crafting a control strategy to reduce ambient concentrations of ozone precursors, GHGs, PM, and TACs.

PM includes fine particulate matter (particulate matter less than 2.5 microns in diameter or PM2.5) and coarser particles (particulate matter less than 10 microns in diameter or PM10). While PM10 is directly emitted as dust and smoke, PM2.5 is a complex pollutant that is both directly emitted as well as created by secondary formation via chemical reactions in the atmosphere, including transforming: 1) NOx and ammonia to ammonium nitrate; and 2) sulfur dioxide and ammonia to ammonium sulfate, among others. PM has been documented to cause a wide range of health effects including bronchitis, asthma, heart attacks, and mortality.

There are hundreds of TACs (e.g. diesel PM, benzene, 1,3-butadiene, formaldehyde, acetaldehyde, hexavalent chromium, etc.) that can cause a wide range of acute and chronic health effects, including cancer and mortality. There are no ambient air quality standards for TACs, aside from lead.

2.3 AGENCY AUTHORITY

2.3.1 2017 CLEAN AIR PLAN

The 2017 Plan sets forth an emission reduction strategy which will require the cooperation and partnership of all levels of government: local, regional, state, and federal, as well as public engagement. Each agency has authority over specific emissions sources. Accordingly, in order for the 2017 Plan to be successful in attaining ambient air quality standards, each agency or jurisdiction implements or commits to specific planning and implementation responsibilities. Interagency commitment and cooperation are keys to success of the 2017 Plan. The following summarizes responsibilities of the regulatory agencies involved in the success of the 2017 Plan:

- At the federal level, the U.S. EPA establishes emission standards for motor vehicles, locomotives, airplanes, and ships. The U.S. EPA also develops fuel standards and regulates non-road (or off-road) engines;
- At the state level, ARB regulates on-road vehicles, motor vehicle fuel specifications, off-road emission standards (e.g., off-road equipment and marine vessels), and consumer product standards. The 2017 Plan includes State Implementation Plan (SIP) strategies to reduce emissions from state and federal sources (e.g., vehicles, trucks, locomotives, air planes, and marine vessels);
- At the regional level, the Air District has lead responsibility for developing stationary, some area, and indirect source control measures and coordinating the development and adoption of the 2017 Plan. The Air District has limited authority over mobile sources. Similarly, MTC and ABAG are responsible for developing Plan Bay Area the Regional Transportation Plan (RTP) and Regional Forecast to 2040; and,
- Lastly, at the local level, county transportation commissions, as well as the cities and counties and their various departments have a dual role related to transportation and land use. Their efforts are coordinated through the regional metropolitan planning organization for the Bay Area, MTC and ABAG, which are responsible for preparing the transportation measures in the 2017 Plan. These measures are also part of the RTP.

2.3.2 CEQA

CEQA, Public Resources Code §21000 et seq., requires that the environmental impacts of proposed projects be evaluated and that feasible methods to reduce, avoid or eliminate significant adverse impacts of these projects be identified and implemented. The lead agency is the "public agency that has the principal responsibility for carrying out or approving a project that may have a significant effect upon the environment." (Public Resources Code §21067.) Since the Air District has the primary responsibility for supervising or approving the proposed project as a whole, it is the most appropriate public agency to act as lead agency under CEQA (CEQA Guidelines §15051(b).)

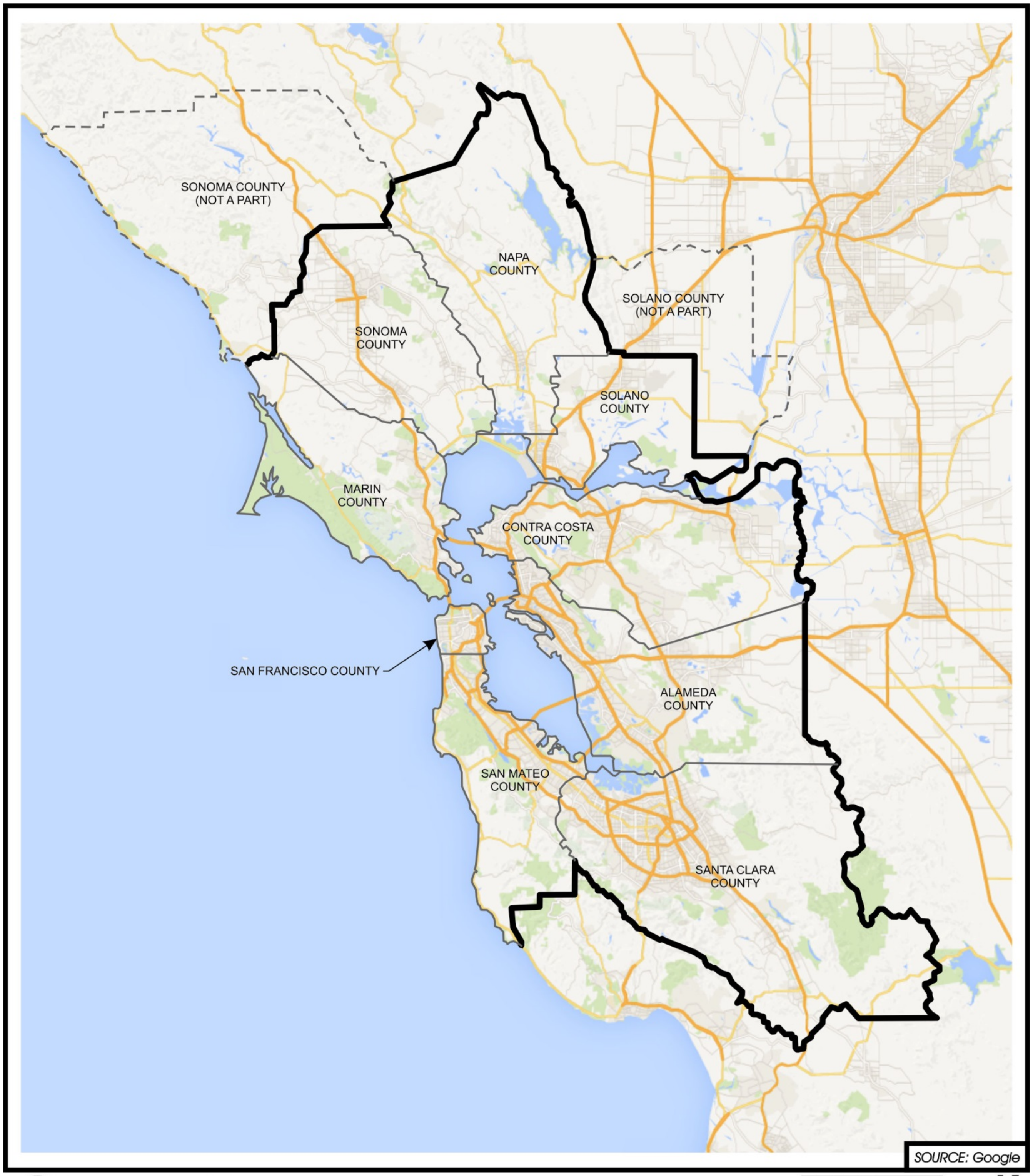
A Program Environmental Impact Report (Program EIR) for the 2017 Plan is considered to be the appropriate document pursuant to CEQA Guidelines §15168(a)(3), because the 2017 Plan constitutes a series of actions that can be characterized as one large project: actions that are related to the issuance of rules, regulations, plans, or other criteria required to govern the conduct of a continuing program.

2.4 PROJECT LOCATION

The Air District has jurisdiction of an area encompassing 5,600 square miles. The Air District includes all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties, and portions of southwestern Solano and southern Sonoma counties. The San Francisco Bay Area is characterized by a large, shallow basin surrounded by coastal mountain ranges tapering into sheltered inland valleys. The combined climatic and topographic factors result in increased potential for the accumulation of air pollutants in the inland valleys and reduced potential for buildup of air pollutants along the coast. The Basin is bounded by the Pacific Ocean to the west and includes complex terrain consisting of coastal mountain ranges, inland valleys and bays (see Figure 2.2-1). The proposed 2017 Plan would affect all counties in the Bay Area within the jurisdiction of the Air District.

2.5 OVERALL ATTAINMENT STRATEGY

The 2017 Plan control strategy builds upon existing regional, State, and national programs that have successfully reduced air pollution and improved public health over the past several decades and also progresses attainment of California ozone standards. The 2017 Plan will identify all "feasible measures" for control of ozone precursors that will assist the Bay Area in attaining the California ozone standards and address pollutant transport to downwind regions, as required by the California CAA. The 2017 Plan has been prepared in accordance with applicable provisions of the California CAA and will update the Bay Area 2010 Clean Air Plan. Measures included in the 2017 Plan are expected to produce environmental benefits by reducing emissions of ozone precursors and other air pollutants.



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BAY AREA AIR QUALITY MANAGEMENT DISTRICT

Project No. 2997

Figure 2.2-1

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2.6 OBJECTIVES OF THE 2017 PLAN

The 2017 Plan focuses on two main goals: protecting public health at both the regional scale and in communities most impacted by air pollution, and protecting the climate. These are discussed in detail in Chapter 1 of the 2017 Plan. As part of meeting those goals, the 2017 Plan also serves as the Air District's ozone attainment plan in compliance with the California Clean Air Act.

Taken together, then, the objectives of the proposed 2017 Plan can be summarized as follows:

- Protect public health.
- Eliminate disparities among Bay Area communities in cancer health risk and toxic air contaminants.
- Protect the climate, by reducing Bay Area GHG emissions in the near term and laying the ground work for deeper reductions in the future to ultimately achieve 40% below 1990 levels by 2030 and 80% below 1990 levels by 2050.
- Comply with the 1988 California Clean Air Act requirements including:
    - Apply best available retrofit control technology (BARCT);
    - Implement all feasible measures through an expeditious implementation schedule
    - Reduce population exposure to ozone and its precursors according to a prescribed schedule;
    - Provide for the attainment of the State ozone ambient air quality standard at the earliest practicable date.
- Comply with transport mitigation requirements in Health and Safety Code §40912.
- Comply with state ambient air quality standards for $PM_{2.5}$.
- Reduce ambient concentrations of toxic air contaminants.

These objectives are provided in compliance with CEQA Guidelines section 15124, subdivision (b), which requires an EIR to include a statement of objectives to describe the underlying purpose of the proposed project. The purpose of the statement of objectives is to aid the lead agency in identifying alternatives and the decision-makers in preparing a statement of findings and a statement of overriding considerations, if necessary.

2.7 PROJECT DESCRIPTION

The 2017 Plan builds upon the foundations that were established in earlier ozone plans, including the 2010 CAP. The 2017 Plan control strategy is based upon the control measures categories of stationary sources, transportation, energy, buildings, agriculture, natural and working lands, waste management, water, and short lived climate pollutants.

The control strategy proposed a total of 85 control measures, in nine categories, as summarized in Table 2.7-1, including:

- 40 control measures to reduce emissions from stationary sources
- 23 transportation control measures
- 2 energy control measures
- 4 new and existing building control measures
- 4 agriculture control measures
- 3 natural and working lands control measures
- 4 waste management control measures
- 2 water control measures
- 3 short lived climate pollutant measures

Stationary Source Measures (SS) focus on the Air District's primary statutory authority to adopt and enforce prohibitory rules to control emissions from factories, refineries, dry cleaners, gasoline stations, etc. About one third of the 40 proposed SS measures focus on reducing GHG emissions, while the remaining SS measures primarily focuses on protecting public health by reducing emissions of criteria pollutants and TACs from oil refineries and other sources.

Transportation Measures (TR) focus on mobile sources to decrease emissions of criteria pollutants, TACs, and GHGs. The 23 TR measures aim to reduce demand for motor vehicle travel, reduce vehicle miles traveled, promote the purchase of efficient vehicles, encourage the use of transit, decarbonize transportation fuels, and electrify mobile sources of emissions.

Energy Measures (EN) focus on the generation and use of electricity within the Bay Area as well as electricity generated outside the Bay Area that is imported and used within the region. The EN measures proposed in the 2017 Plan will reduce emissions of criteria pollutants, TACs, and GHGs by decreasing demand through conservation and reducing the carbon intensity of electricity by switching to less or zero GHG intensive fuel sources for electricity generation.

Building Measures (BL) focus on improving the energy efficiency of buildings, including regulatory actions related to boilers and water heaters. The BL control measures proposed will reduce emissions of criteria pollutants. TACs and GHGs by promoting energy efficiency, the use of electricity and on site renewable energy in both existing and new buildings to reduce fossil fuel consumption, and working to ensure that new construction incorporates low- and zero-carbon technologies.

Agricultural Measures (AG) focus on reducing GHG emissions from everyday agricultural operations through more efficient agricultural equipment, soil management practices and the raising of livestock and handling of animal waste, carbon sequestrations and biogas systems.

Natural and Working Lands Measures (NW) focus on removing carbon from the atmosphere through carbon sequestration on rangelands and wetlands, and urban tree planting to sequester carbon and provide shade to reduce urban heat island effects.

Waste Management Measures (WA) focus on reducing or capturing methane emissions from landfills and composting facilities, diverting organic material away from landfills, and increasing waste diversion rates through efforts to reuse, reduce and recycle.

Water Measures (WR) focus on reducing emissions of criteria pollutants, TACs, and GHGs by encouraging water conservation, limiting GHG emissions from publicly owned treatment works (POTWs), and promoting the use of biogas recovery systems.

Super-GHG Measures (SL) are intended to reduce emissions of short lived climate pollutants including methane, black carbon, and fluorinated gases. Many of the SL measure reduction methods are addressed in other sectors of the control strategy such as waste, agriculture, stationary sources, and transportation.

TABLE 2.7-1
2017 Plan Control Measures

Control Measure	Control Measure Title (Pollutant)	Control Methodology
Stationary Source Measures		
SS1	Fluid Catalytic Cracking in Refineries (PM)	Reduces condensable PM and imposes limits on emissions of ammonia under Regulation 6-5 in fluid catalytic cracking units.
SS2	Equipment Leaks (ROG, GHGs)	Reduce fugitive emissions of organic gases, including methane, from refineries, chemical plants, bulk plants and bulk terminals. Develop an implementation plan for Rule 8-18 to require future monitoring of equipment in heavy liquid service, require facilities to identify the causes of background readings greater than 50 parts per million volume (ppmv), etc.
SS3	Cooling Towers (ROG, TACs)	Requires installation of continuous THC monitors, sets concentrations standards for old and new towers, requires minimization of leak within 5 calendar days and repair within 21.
SS4	Refinery Flares (ROG, SO_2, PM)	Review the results of refinery flare monitoring Rule 12- 11 and flare reduction Rule 12-12 at each of the five refineries in the Bay Area to identify amendments that may make the rules more effective at reducing emissions.
SS5	Sulfur Recovery Units (SO_2)	Consider amendments to Air District Rule 9-1 to achieve the lowest SO2 emissions feasible at sulfur recovery units without the addition of caustic scrubbing.
SS6	Refinery Fuel Gas (SO_2)	Regulation 9-1 implements control measures to limit emissions from the combustion of refinery fuel gases.
SS7	Sulfuric Acid Plants (SO_2)	Regulation 9-1 implements control measures that lower emission limits of SO_2 from acid plants that perform sulfuric acid regeneration.

TABLE 2.7-1
2017 Plan Control Measures

Control Measure	Control Measure Title (Pollutant)	Control Methodology
SS8	Coke Calcining (PM, SO_2)	Limit SO_2 emissions from petroleum coke calcining operations equivalent to meet a mass emissions limit of 1,050 TPY and an hourly limit of 320 pounds per hour.
SS9	Enhanced NSR Enforcement for Changes in Crude Slate (All Pollutants)	Require a refinery to obtain a permit for any significant change in crude slate. Requiring a review of all such significant crude slate changes will allow the Air District to evaluate such changes in detail and ensure that they will comply with applicable NSR permitting requirements.
SS10	Petroleum Refining Emissions Tracking (All Pollutants)	Implement a newly adopted rule (Rule 12-15) which will: 1) improve petroleum refinery emissions inventories of criteria pollutants, toxic air contaminants (TACs) and greenhouses gases (GHGs), 2) collect volume and composition data on crude oil and other feedstocks processed by refineries, 3) expand refinery fenceline air monitoring and community air monitoring, and 4) collect information about equipment and operational practices where refinery energy utilization could be improved so that GHG emissions could be reduced.
SS11	Petroleum Refining Facility-Wide Emission Limits (GHG, PM, NO_X, SO_2)	Consider limiting facility-wide emissions of GHG and three criteria air pollutants—PM, NOX and SO2—from Bay Area petroleum refineries through Air District Rule 12-16.
SS12	Petroleum Refining Climate Impacts Limit (GHG)	Limit facility-wide carbon intensity at each Bay Area petroleum refinery through a new Air District regulation. Carbon intensity for each refinery would be tracked with a Refining Climate Index (RCI). Emission increases that result in RCI increases over an established baseline would be required to be offset using the existing Low Carbon Fuel Standard (LCFS) framework.
SS13	Oil and Gas Production, Processing and Storage (TAC. ROG, GHG)	Work with ARB on the development of its Oil and Gas Rule. In addition, consider amending Rule 8-37 to limit emissions from oil and natural gas production, processing and storage operations.
SS14	Methane from Capped Wells (ROG, TAC, GHG)	Estimate the magnitude and approximate composition of the fugitive emissions from Bay Area capped wells. Establish emission limits for methane to support ARB's AB32 Scoping Plan and the Air District's GHG reduction goals. Adopt thresholds for ROG and toxic pollutant emissions from relevant existing regulations.
SS15	Natural Gas Processing and Distribution (GHG)	Review the utility-reported data, when available, to glean additional information on GHG emissions and practices used to prevent and minimize methane emissions. Continue to participate in the CPUC regulatory process.
SS16	Basin-Wide Methane Strategy (GHG)	Quantify and reduce emissions of methane, and its co-pollutants, from all sources throughout the Air District by implementing a coordinated strategy that combines research, rulemaking and collaborations with state agencies and other programs.
SS17	GHG BACT Threshold	Revise Air District rules to reduce the threshold at which facilities

TABLE 2.7-1
2017 Plan Control Measures

Control Measure	Control Measure Title (Pollutant)	Control Methodology
	(GHG)	must implement Best Available Control Technology to control their GHG emissions.
SS18	Basin-Wide Combustion Strategy (GHG, PM)	Stabilize and then reduce emissions of greenhouse gas (GHG), criteria air pollutant and toxic emissions from stationary combustion sources throughout the Air District by first establishing carbon intensity caps on major GHG sources, and then adopting new rules to reduce fuel use on a source-type by source-type basis.
SS19	Portland Cement (SO_2, PM, GHG)	Amend sections of existing Air District Rule 9-13 pertaining to ammonia emissions to allow for replacement of the rolling 24-hour average with a different operating day averaging period for ammonia emissions. Amend Rule 9-13 to impose a standard for SO2 consistent with other Air District rules; amend the rule as necessary to incorporate language regarding detached plumes, and consider amendments to the rule to reduce GHG emissions.
SS20	Air Toxics Risk Cap and Reduction from Existing Facilities (TAC)	Consider reducing public exposure to toxic air contaminants (TACs) from existing facilities through Draft Rule 11-18.
SS21	New Source Review for Toxics (TAC)	Propose revisions to Air District Rule 2-5, New Source Review of Toxic Air Contaminants, based on OEHHA's 2015 Health Risk Assessment Guidelines and ARB/ CAPCOA's 2015 Risk Management Guidance. Revise the Air District's health risk assessment trigger levels for each toxic air contaminant using the 2015 Guidelines and most recent health effects values.
SS22	Stationary Gas Turbines (NO_x)	Reduce nitrogen oxide emissions from stationary gas turbines.
SS23	Biogas Flares (NOx)	Develop a new Air District rule to reduce NOX from nonrefinery flares and investigate potential for more stringent limits on emissions from non-refinery flares.
SS24	Sulfur Limits of Liquid Fuels (SO_2, PM)	Revise Rule 9-1 to include fuel-specific sulfur content limits for diesel and other liquid fuels.
SS25	Coatings, Solvents, Lubricants & Adhesives (ROG)	Reduce emissions by reviewing and altering the coatings, solvents, lubricants, and adhesives used on products.
SS26	Surface Prep and Cleaning Solvent (ROG)	Reduce emissions by reviewing and altering the cleaning solvents used for general product cleaning, surface preparation, and equipment cleaning.
SS27	Digital Printing (ROG)	Establishes ROG emission standards from digital printing and implements equipment requirements and add on controls.
SS28	LPG, Propane, Butane (ROG)	Investigate potential ROG reductions by regulating filling of, and leakage from LPG, propane and butane tanks.
SS29	Asphaltic Concrete (ROG)	Evaluate the cost effectiveness, and feasibility of limiting solvent content of emulsified asphalt and the availability of substitutes for diesel to clean asphalt related equipment.
SS30	Residential Fan Type	Reduce NOX emission limits on new and replacement central

TABLE 2.7-1
2017 Plan Control Measures

Control Measure	Control Measure Title (Pollutant)	Control Methodology
	Furnaces (NOx)	furnace installations. Explore potential Air District rulemaking options regarding the sale of fossil fuel-based space and water heating systems for both residential and commercial use.
SS31	General PM Emission Limitation (PM)	Reduce or revise the Air District's allowable weight rate limitations for particulate matter.
SS32	Emergency Backup Generators (DPM, TAC)	Reduce emissions of DPM and black carbon from BUGs through Draft Rule 11-18, resulting in reduced health risks to impacted individuals, and in climate protection benefits.
SS33	Commercial Cooking Equipment (PM)	Consider PM limits for additional commercial cooking sources, specifically under-fire charbroilers.
SS34	Wood Smoke (PM)	Consider further limits on wood burning, including additional limits to exemptions from Air District Rule 6-3: Wood Burning Devices.
SS35	PM from Bulk Materials, including Coke and Coal (PM)	Develop Air District rule limits to prevent and control wind-blown fugitive dust from bulk material handling operations. Establish enforceable visible emission limits to support preventive measures such as water sprays, enclosures and wind barriers.
SS36	PM from Track Out (PM)	Develop new Air District rule to prevent mud/dirt and other solid trackout from construction, landfills, quarries and other bulk material sites.
SS37	PM from Asphalt Operations (PM)	Develop an Air District rule to require abatement/control of blue smoke emissions related to asphalt delivery to roadway paving projects.
SS38	Fugitive Dust (PM)	Consider applying the Air District's proposed fugitive dust visible emissions limits to a wider array of sources.
SS39	Enhanced Air Quality Monitoring (All Pollutants)	Ensure representative air quality data is being collected in impacted communities. Partner with county Health Departments to identify areas of poor air quality and collaborate with the community on ways to potentially measure and reduce exposure and emissions from local and regional sources. Require petroleum refineries to prepare and submit to the Air District an air monitoring plan for establishing an air monitoring system. Implement the Community Monitoring Program.
SS40	Odors (Odors)	Propose amendments to Regulation 7 to strengthen odor standards and enhance enforceability. An evaluation of newer air monitoring technologies will be aimed at increasing enforceability of the rule with respect to a wider range of odorous compounds and sources.
Transportation Measures		
TR1	Clean Air Teleworking Initiative (All Pollutants)	Develop teleworking best practices for employers and develop additional strategies to promote telecommuting. Promote teleworking on Spare the Air Days.
TR2	Trip Reduction Programs (All Pollutants)	Implement the regional Commuter Benefits Program (Rule 14-1) that requires employers with 50 or more Bay Area employees to provide commuter benefits. Encourage trip reduction policies and programs in local plans, e.g. general and specific plans while

TABLE 2.7-1
2017 Plan Control Measures

Control Measure	Control Measure Title (Pollutant)	Control Methodology
		providing grants to support trip reduction efforts. Encourage local governments to require mitigation of vehicle travel as part of new development approval, to adopt transit benefits ordinances in order to reduce transit costs to employees, and to develop innovative ways to encourage rideshare, transit, cycling, and walking for work trips. Fund various employer-based trip reduction programs.
TR3	Local and Regional Bus Service (All Pollutants)	Fund local and regional bus projects.
TR4	Local and Regional Rail Service (All Pollutants)	Fund local and regional rail service projects.
TR5	Transit Efficiency and Use (All Pollutants)	Improve transit efficiency and make transit more convenient for riders through continued operation of 511 Transit, full implementation of Clipper® fare payment system and the Transit Hub Signage Program.
TR6	Freeway and Arterial Operations (All Pollutants)	Improve the performance and efficiency of freeway and arterial systems through operational improvements, such as implementing the Freeway Performance Initiative, the Freeway Service Patrol and the Arterial Management Program.
TR7	Safe Routes to Schools and Safe Routes to Transit (All pollutants)	Provide funds for the regional Safe Routes to School and Safe Routes to Transit Programs.
TR8	Ridesharing Last-Mile Connection (All Pollutants)	Promote carpooling and vanpooling by providing funding to continue regional and local ridesharing programs, and support the expansion of carsharing programs. Provide incentive funding for pilot projects to evaluate the feasibility and cost-effectiveness of innovative ridesharing and other last-mile solution trip reduction strategies. Encourage employers to promote ridesharing and carsharing to their employees.
TR9	Bicycle Access and Pedestrian Facilities (All Pollutants)	Encourage planning for bicycle and pedestrian facilities in local plans, e.g. general and specific plans, fund bike lanes, routes, paths and bicycle parking facilities.
TR10	Land Use Strategies (All Pollutants)	Support implementation of Plan Bay Area, maintain and disseminate information on current climate action plans and other local best practices, and collaborate with regional partners to identify innovative funding mechanisms to help local governments address air quality and climate change in their general plans.
TR11	Value Pricing (All Pollutants)	Implement and/or consider various value pricing strategies.
TR12	Smart Driving (All Pollutants)	Implement smart driving programs with businesses, public agencies and possibly schools and fund smart driving projects.
TR13	Parking Policies (All Pollutants)	Encourage parking policies and programs in local plans, e.g. reduce minimum parking requirements; limit the supply of off-street parking in transit-oriented areas; unbundle the price of parking spaces; support implementation of demand-based pricing (such as

TABLE 2.7-1
2017 Plan Control Measures

Control Measure	Control Measure Title (Pollutant)	Control Methodology
		"SF Park") in high-traffic areas.
TR14	Cars and Light Trucks (All Pollutants)	Commit regional clean air funds toward qualifying vehicle purchases and infrastructure development. Partner with private, local, state and federal programs to promote the purchase and lease of battery-electric and plug-in hybrid electric vehicles.
TR15	Public Outreach and Education (All Pollutants)	Implement the Spare the Air Every Day Campaign including Spare the Air alerts, employer program, and community resource teams, a PEV Outreach campaign and the Spare the Air Youth Program.
TR16	Indirect Source Review (All Pollutants)	Consider a rule that sets air quality performance standards for new and modified development projects.
TR17	Planes (NOx)	Work with the appropriate partners to increase the use of cleaner burning jet fuel and low-NOX engines in commercial jets arriving and departing the Bay Area.
TR18	Goods Movement (All Pollutants)	Continue participation in the preparation and implementation of the Regional Goods Movement Plan. Participate in the Goods Movement Collaborative, led by the Alameda County Transportation Commission, and assist MTC in development of the Freight Emissions Action Plan.
TR19	Medium- and Heavy-Duty Trucks (All Pollutants)	Directly provide, and encourage other organizations to provide, incentives for the purchase of 1) new trucks with engines that exceed ARB's 2010 NO_X emission standards for heavy-duty engines, 2) new hybrid trucks, and 3) new zero-emission trucks. The Air District will work with truck owners, industry, ARB, the California Energy Commission, and others to demonstrate additional battery-electric and hydrogen fuel cell zero-emission trucks.
TR20	Ocean Going Vessels (All Pollutants)	Replicate the Green Ship Program that has been implemented at the ports of Los Angeles and Long Beach. Financial incentives for cleaner Tier 2 and Tier 3 oceangoing vessels to call at the ports serve as the basis of the Program. The Program was initiated as part of the San Pedro Bay Ports Clean Air Action Plan. This measure also recognizes the need to monitor progress under such programs and augment them as necessary to ensure sufficient results.
TR21	Commercial Harbor Craft (All Pollutants)	Focus on assisting fleets to achieve early compliance with the ARB harbor craft air toxic control measure and supporting research efforts to develop and deploy more efficient engines and cleaner, renewable fuels for harbor craft.
TR22	Construction and Farming Equipment (All Pollutants)	Installation of abatement devices for existing construction, freight, and farming equipment as well as the replacement of older diesel equipment, incentivize the upgrade to electric or Tier IV equipment.
TR23	Lawn and Garden Equipment (All Pollutants)	Seek additional funding to expand the Commercial Lawn and Garden Equipment Replacement Program into all nine Bay Area counties. Explore options to expand Lawn and Garden Equipment Program to cover shredders, stump grinders and commercial turf equipment.

TABLE 2.7-1
2017 Plan Control Measures

Control Measure	Control Measure Title (Pollutant)	Control Methodology
	Energy Measures	
EN1	Decarbonize Electricity Production (All Pollutants)	Engage with PG&E, municipal electric utilities and CCEs to maximize the amount of renewable energy contributing to the production of electricity within the Bay Area as well as electricity imported into the region. Work with local governments to implement local renewable energy programs. Engage with stakeholders including dairy farms, forest managers, water treatment facilities, food processors, public works agencies and waste management to increase use of biomass in electricity production.
EN2	Decrease Electricity Demand (All Pollutants)	Work with local governments to adopt additional energy efficiency policies and programs. Support local government energy efficiency program via best practices, model ordinances, and technical support. Work with partners to develop messaging to decrease electricity demand during peak times.
	Building Measures	
BL1	Green Buildings (All Pollutants)	Collaborate with partners such as KyotoUSA to identify energy-related improvements and opportunities for onsite renewable energy systems in school districts; investigate funding strategies to implement upgrades. Identify barriers to effective local implementation of the CALGreen (Title 24) statewide building energy code; develop solutions to improve implementation/enforcement. Work with ABAG's BayREN program to make additional funding available for energy-related projects in the buildings sector. Engage with additional partners to target reducing emissions from specific types of buildings.
BL2	Decarbonize Buildings (All Pollutants)	Explore potential Air District rulemaking options regarding sale of fossil fuel-based space and water heating systems for residential and commercial use. Explore incentives for property owners to replace their furnace, water heater or natural-gas powered appliances with zero-carbon alternatives. Update Air District guidance documents to recommend that commercial and multi-family developments install ground source heat pumps and solar hot water heaters.
BL3	Market-Based Solutions (All Pollutants)	Implement a call for innovation to support market-based approaches that bring new, viable solutions to significantly reduce GHG emissions associated with existing buildings.
BL4	Urban Heat Islands (All Pollutants)	Develop and urge adoption of a model ordinance for "cool parking" that promotes the use of cool surface treatments for new parking facilities, as well existing surface lots undergoing resurfacing. Develop and promote adoption of model building code requirements for new construction or re-roofing/roofing upgrades for commercial and residential multi-family housing. Collaborate with expert partners to perform outreach to cities and counties to make them aware of cool roofing and cool paving techniques, and of new tools available.

TABLE 2.7-1
2017 Plan Control Measures

Control Measure	Control Measure Title (Pollutant)	Control Methodology
Agriculture Measures		
AG1	Agricultural Guidance and Leadership (GHG)	Reduce GHGs from the agriculture sector, including working to obtain funding for on-farm GHG reduction activities; promoting carbon farm plans; providing guidance to local governments on including carbon-based conservation farming measures and carbon sequestration in local climate actions plans; and conducting outreach to agriculture businesses on best practices, including biogas recovery, to reduce GHG emissions.
AG2	Dairy Digesters (GHG)	Promote implementation of dairy digester facilities (also known as biogas recovery) at farms to capture methane as an energy source and to reduce methane emissions.
AG-3	Enteric Fermentation (GHG)	Promote dietary strategies and grazing management measures to reduce methane emissions from enteric fermentation.
AG4	Livestock Waste (PM, ROG, and ammonia)	Require best management practices already being implemented in the SJVAPCD and SCAQMD to be applied at Bay Area dairies and other confined animal facilities.
Natural and Working Lands		
NW1	Carbon Sequestering in Rangelands (GHG)	Include off-site mitigation of GHG emissions through carbon sequestration projects in the Air District's CEQA guidance and comments. Develop climate action plan guidance and/or best practices on soil management for local agencies and farmers and their associations to maximize GHG sequestration on rangelands.
NW2	Urban Tree Planting (Criteria pollutants, GHG)	Develop or identify an existing model municipal tree planting ordinance and encourage local governments to adopt such an ordinance. Include tree planting recommendations the Air District's technical guidance, best practices for local plans and CEQA review.
NW3	Carbon Sequestration in Wetlands (GHG)	Identify federal, state and regional agencies, and collaborative working groups that the Air District can assist with technical expertise, research or incentive funds to enhance carbon sequestration in wetlands around the Bay Area. Assist agencies and organizations that are working to secure the protection and restoration of wetlands in the San Francisco Bay.
Waste Measures		
WA1	Landfills (GHG, ROG, TACs)	Propose amendments to Air District Rule 8-34 to increase stringency of emission limits, including fugitive leak standards, and improve consistency with federal rules.
WA2	Composting and Anaerobic Digestion (GHG, ROG, PM)	Develop an Air District rule that includes emission limits based on best practices in other areas of the state.
WA3	Green Waste Diversion (All Pollutants)	Develop model policies to facilitate local adoption of ordinances and programs to reduce the amount of green waste going to landfills.
WA4	Recycling and Waste Reduction (GHG)	Develop or identify and promote model ordinances on community-wide zero waste goals and recycling of construction and demolition materials in commercial and public construction projects.

TABLE 2.7-1
2017 Plan Control Measures

Control Measure	Control Measure Title (Pollutant)	Control Methodology
	Water Measures	
WR1	Limit GHGs from POTWs (GHG, ROG, TACs)	Initiate a process to better understand and quantify GHG emissions at POTWs. Explore rulemaking to reduce GHGs emitted directly within POTWs. Promote the use of biogas recovery systems at POTWs.
WR2	Support Water Conservation (GHG)	Develop a list of best practices that reduce water consumption and increase on-site water recycling in new and existing buildings; incorporate into local planning guidance.
	Super-GHG Control Measures	
SL1	Super-GHGs (GHG, including black carbon)	Reduce methane from landfills and farming activities through various control measures listed under waste and agriculture sectors. Develop a rule to reduce methane emissions from natural gas pipelines and processing operations, and amend regulations to reduce emissions of methane and other organic gases from equipment leaks at oil refineries. Enforce applicable regulations on the servicing of existing air conditioning units in motor vehicles, support the adoption of more stringent regulations by ARB and/or U.S. EPA, and encourage better HFC disposal practices.
SL2	Guidance for Local Planners (GHG)	Track progress in adoption and implementation of super-GHG reduction measures in local plans and programs.
SL3	GHG Monitoring and Emissions Measurement Network (GHG)	Develop a GHG air monitoring plan for the Bay Area that includes strategic selection of measurement locations, selection of relevant measurement technologies and procurement of appropriate GHG instrumentation, calibration gas standards and sampling logistics. Establish, operate and maintain the GHG air monitoring network. Collaborate with the scientific community to use different methods to estimate methane emissions in the Bay Area and identify sectors and areas for focused measurement study.

2.7.1 TRANSPORT MITIGATION REQUIREMENTS

The California CAA requires ARB to periodically assess transport of ozone and ozone precursors from upwind to downwind regions, and to establish mitigation requirements for upwind districts (Cal. Health and Safety. Code §39610). The California CAA also requires air districts to address transport mitigation requirements in the triennial updates to strategies to achieve the State ozone standard (Sec. 40912). To summarize the transport mitigation requirements, the Air District must:

1. Adopt and implement all feasible measures;
2. Adopt and implement Best Available Retrofit Technology (BARCT);
3. Adopt a no net increase permitting program for sources above 10 tons per year; and,

4. Include measures to attain the standard in specified downwind regions.

The 2017 Plan addresses all of the above. The requirements to adopt all feasible measures, and implement BARCT on all existing stationary sources are necessary for the Bay Area to meet both attainment planning and transport mitigation requirements. These requirements are addressed in the control strategy as well as through Air District rule development and permitting processes. With respect to no net increase requirement, the Air District adopted a 10 ton/year no net increase requirement for ozone precursors in District Regulation 2, Rule 2: New Source Review on December 21, 2004. Regarding measures sufficient to attain the State ozone standard in specified transport areas, this is accomplished through the proposal to adopt all feasible measures as identified in the control strategy. As adoption of all feasible measures represents the most stringent control strategy that can be accomplished, this requirement is met with the approval of each triennial plan.

2.7.2 STATIONARY SOURCE CONTROL MEASURES

A brief description of each of the 40 Stationary Source Measures is provided below. Full descriptions and evaluations of each individual control measure are provided in Volume 2 of the 2017 Plan.

SS1 –Fluid Catalytic Cracking in Refineries [PM]: Fluid catalytic cracking units (FCCUs) are complex processing units that crack heavy oils from crude distillation units into lighter oils using a chemical reaction promoted by a powdered catalyst. FCCU emissions are generated during the coke burn off process so that the catalyst may be reused. This control measure seeks to reduce the emissions of condensable PM from FCCUs as well as emissions of precursors to the formation of secondary PM. Emissions will be reduced under Air District Regulation 6-5 which imposes a limit on ammonia emissions in refineries using FCCUs. Ammonia is a precursor to the formation of both condensable PM and secondary PM. Regulation 6-5 also gives the option to perform an ammonia optimization study and to propose higher ammonia limits that result in lower overall condensable PM emissions.

SS2 – Equipment Leaks [ROG, GHG]: This control measures seeks to reduce emissions of ROGs and methane from equipment leaks at petroleum refineries. Equipment leaks commonly occur at the joints or connections between sections of piping, at valves, at pumps or from barrier fluid contained between seals, and at leaking pressure relief devices. Air District Regulation 8, Rule 18 was amended in 2015, requiring future monitoring of equipment in heavy liquid service, reducing the amount of equipment that can be added to the "non-repairable" equipment list, adding a maximum mass emission rate for fugitive equipment subject to the rule, and requiring facilities to identify the causes of background readings greater than 50 parts per million by volume (ppmv). The Air District will develop an implementation plan for the Rule.

SS3 – Cooling Towers [ROG, TACs]: Large scale refineries operate cooling towers which are large, industrial heat exchangers that dissipate significant heat loads to the atmosphere through the evaporation of water. Process liquids, which can contain total hydrocarbons (THC) and hazardous air pollutants (HAPs), can leak into the cooling towers and when this occurs, THC and HAPs can be emitted into the environment. This control measure aims to reduce the amount of THC and HAP emissions from cooling towers by requiring more rapid detection and repair of leaking heat exchanges. Emissions of THC and HAPs will be reduced through amendments to Air District Regulation 11, Rule 10. The amendments now require installation of continuous THC monitors or daily THC tests in cooling waters at petroleum refineries and established a THC concentration standard of 6 parts per million by volume (ppmv) for existing cooling towers and 3 ppmv for new cooling towers. THC and HAP emissions also will be reduced by requiring refineries to minimize a leak within 5 calendar days and to repair the leak within 21 days.

SS4 – Refinery Flares [ROG, SO_2, PM]: The purpose of this control measure is to reduce the frequency and magnitude of flaring events which in turn, will reduce PM and ROG emissions. The Air District's refinery flare reduction rule 12-11 has been in place since 2005 and requires the preparation of a Flare Minimization Plan (FMP) which includes detailed information about refinery equipment as well as steps the refinery has taken to minimize flare frequency and implementation schedules for prevention measures. Under this control measure, the rule will be re-evaluated to determine areas of opportunity to further reduce emissions from flares and to redefine flaring that should be allowed in the FMP.

SS5 – Sulfur Recovery Units [SO_2]: Crude petroleum naturally contains some sulfur compounds but, because gasoline, diesel fuel, and other refined petroleum products are required to contain sulfur concentrations on the order of parts per million (ppm), sulfur must be removed during the refining process. A majority of sulfur is recovered in the sulfur recovery units (SRUs) but, unrecovered sulfur is emitted as SO_2. This control measure aims to reduce SO_2 emissions from sulfur that is removed from petroleum feedstocks. Emissions will be reduced from implementation of current, achievable practices such as those implemented in the South Coast Air Quality Management District (SCAQMD). These practices include equipment limits that meet SO_2 emissions limits on the order of 5 to 10 ppm. Amendments to Air District Rule 9-1 will aim to achieve the lowest SO_2 emissions feasible at SRUs as well as analyze further possible reduction strategies.

SS6 – Refinery Fuel Gas [SO_2]: Refinery fuel gases (RFGs), which are used as fuel in steam generators and other combustion units, contain naturally occurring sulfur compounds and as such, produce sulfur dioxide (SO_2) as a combustion byproduct. This control measure seeks to reduce SO_2 emissions from RFG combustion at petroleum refineries. Air District Regulation 9-1 implemented requirements for sulfur compound emissions from RFG combustion. This control measure will amend Regulation 9-1 to reduce fuel sulfur limits for RFG as well as determine appropriate averaging periods for SO_2.

SS7 – Sulfuric Acid Plants [SO_2]: The purpose of this control measure is to reduce SO_2 emissions from sulfuric acid regeneration associated with petroleum refining. Sulfuric acid is used as a catalyst in alkylation units at refineries and over times becomes contaminated with petroleum products and needs to be regenerated. The regeneration reaction is never 100 percent efficient so there is always some unreacted SO_2 that must be vented to the atmosphere. This control measure will evaluate Air District Regulation 9-1 to determine if amendments will be made that would change SO_2 emission limits from acid plants associated with petroleum refining, and would consider establishing BARCT limits of 0.2 lbs of acid mist per ton of acid produced.

SS8 –Coke Calcining [PM, SO_2]: This control measure seeks to reduce SO_2 emissions from petroleum coking calcining and would require that coke calcining kilns remove an equivalent of 59 percent of the SO_2 emissions created by the calcining process. These reductions will be achieved through Air District Regulation 9, Rule 14 (Rule 9-14), adopted in April 2016. The rule proposed an hourly limit of SO2 emissions from petroleum coke calcining operations equivalent to meet a mass emissions limit of 1,050 TPY and an hourly limit of 320 pounds per hour.

SS9 – Enhanced NSR Enforcement for Changes in Crude Slate [All Pollutants]: This control measure would require refineries to obtain a permit for any significant changes in crude slate. A permit would be required regardless of whether or not the refinery believes the modification is subject to New Source Review (NSR). NSR is a comprehensive air permitting program that applies to a wide range of stationary source facilities within the Air District's regulatory jurisdiction. The program requires a facility to obtain a permit and implement state-of-the-art air pollution control technology whenever a facility installs a new source of air emissions or modifies an existing source. By revising the definition of "alteration" in regards to crude slate changes, the Air District can require refineries to obtain a permit and thus will be able to review any possible emission changes and implement control measures as needed.

SS10 – Petroleum Refining Emissions Tracking [All Pollutants]: This control measure seeks to improve refinery emission inventories of TACs, GHGs, and criteria pollutants. In order to achieve inventory improvements, a new rule, Regulation 12-15, was adopted by the Air District in April 2016. The rule requires refineries to prepare reports of emissions of criteria pollutants, toxic air contaminants, and greenhouse gases from the refinery (refineries and certain refinery support facilities); generate a crude slate report describing the characteristics of crude oil and imported feedstocks processed by the refinery; and develop air monitoring plans and install and operate fence-line air monitoring systems.

SS11 – Petroleum Refining Facility-Wide Emissions Limits [GHG, PM, NO_x, SO_2]: This control measure would limit facility-wide emissions of GHG, and three criteria air pollutants - particulate matter (PM), oxides of nitrogen (NO_x), and sulfur dioxide (SO_2). The purpose of this control measure is to prevent increases of GHG and certain criteria air pollutant emissions that could result from operational changes at Bay Area refineries in order to protect the climate, and the region's air quality. The Air District will develop draft language for new regulation, Rule 12-16, based on Communities for a Better Environment's proposal, in order to evaluate its cost-effectiveness and socioeconomic impacts as part of the rule development process.

SS12 – Petroleum Refining Climate Impacts Limit [GHG]: This control measure would limit facility-wide carbon intensity at each Bay Area petroleum refinery through a new Air District regulation. Carbon intensity for each refinery would be tracked with a Refining Climate Index (RCI). Emission increases that result in RCI increases over an established baseline would be required to be offset using the existing Low Carbon Fuel Standard (LCFS) framework. The Air District will evaluate the cost-effectiveness and socioeconomic impacts of establishing a RCI limit for each of the Bay Area refineries as part of the rule development process.

SS13 –Oil and Gas Production, Processing and Storage [TAC, ROG, GHG]: This control measure seeks to reduce emissions of methane, TACs, and volatile organic compounds (VOCs) from natural gas and crude oil production, processing and storage facilities. This control measure seeks to control fugitive and vented emissions from these operations by working with ARB on their upcoming oil and gas rule. Once adopted, the Air District plans to collaborate with ARB on the implementation and enforcement of the oil and gas rule, including its provisions for natural gas underground storage facilities. The Air District will also consider amending Rule 8-37 to ensure it properly addresses local needs and concerns that may not be the focus of ARB's rule, including the applicability of thresholds, testing methodology, and storage tanks and loading.

SS14 – Methane from Capped Wells [ROG, TAC, GHG]: This control measure seeks to characterize emissions from capped oil and gas wells and to explore rulemaking to address the emissions. There are over 1,200 capped oil and gas wells in the Bay Area but no emissions data are available for these facilities. This control measure seeks to better characterize emissions from these capped oil and gas wells, and to explore rulemaking to address these emissions. The Division of Oil, Gas, and Geothermal Resources (DOGGR) will be engaged to obtain more information on inactive oil and gas wells in the Bay Area and coordinate with the Air District's current efforts for a mobile GHG measurement platform to collect source-specific data. Thresholds for emissions would be adopted from current regulations such as the ARB's AB 32 Scoping Plan.

SS15 – Natural Gas Processing and Distribution [GHG]: This control measure seeks to ensure reductions of methane emissions from natural gas pipelines and processing operations. Senate Bill 1371 seeks to reduce natural gas leaks associated with GHG emissions and sets forth requirements for the ARB and the California Public Utilities Commission (CPUC). The Air District will engage and review with the ARB and CPUC's current regulations and practices to minimize methane emissions when developing a program to address methane emissions. Elements of the proposed program may include an audit of the pipeline system to map and identify all natural gas lines in the district as well as establish a place for the rehabilitation or replacement of existing pipelines.

SS16 – Basin-Wide Methane Strategy [GHG]: This control measure seeks to better quantify and reduce emissions of methane, and its co-pollutants from natural gas & oil refining, production, storage and distribution, landfills, POTWs, and livestock facilities. The Air District will develop a reliable method to document significant methane leaks and work with stakeholders to determine cost of compliance with leak reduction methods. Regulation 8-2 will be re-evaluated to prohibit significant leaks of methane throughout the Air District. The Air District will also consider removing the methane exemption from existing Regulation 8 rules when appropriate.

SS17 – GHG BACT Threshold [GHG]: This control measure would lower the threshold at which facilities must implement the Best Available Control Technology (BACT). Currently, the threshold for implementing BACT is 75,000 tons per year (tpy) CO2e. The Air District would create a new subsection in Rule 2-2 that sets forth the Prevention of Significant Deterioration (PSD) requirements using the Best Available Control Technology (BACT).

SS18 – Basin-Wide Combustion Strategy [GHG, PM]: This control measures seeks to stabilize and then reduce emissions of GHG, criteria air pollutant and toxic emissions from stationary combustion sources throughout the Air District by first establishing carbon intensity caps on major GHG sources, and then adopting new rules to reduce fuel use on a source-type by source-type basis. The Air District will evaluate carbon intensity caps for the refinery, power generation and cement sectors; promote energy efficiency improvements through new rules on a source-type by source-type basis; evaluate combustion sources for emissions and efficiency in order to identify cost-effective and technically feasible improvements that would lead to reductions in fuel use; and prioritize the evaluation of combustion sources based on the magnitude of the emissions and the energy efficiency opportunities for each source-type.

SS19 – Portland Cement [SO_2, PM, GHG]: This control measure would amend sections of the regulation for emissions from cement manufacturing. There is only one operating cement manufacturing plant in the Bay Area, Lehigh. As it is now, Air District Regulation 9, Rule 13, which governs emissions from cement manufacturing, assumes a consistent level of ammonia (NH_3) in feedstocks but data from Lehigh shows variability in baseline NH_3 levels. Lehigh is also the largest source of uncontrolled SO_2 emissions in the Bay Area as the plant does not have control devices installed to reduce emissions. Regulation 9, Rule 13 will be amended to replace the rolling 24-hour average with a different averaging period for ammonia emissions so that the average better reflects actual conditions. Amendments will also impose an emissions standard for SO_2 that is consistent with or more other Air District rules.

SS20 – Air Toxics Risk Cap and Reduction from Existing Facilities [TAC]: This control measure seeks to further reduce public exposure to toxic air contaminants (TACs) from existing facilities to ensure that existing facilities that emit TACs do not pose an unacceptable health risk to nearby residents, workers, and/or students. Proposed Rule 11-

18 is expected to substantially reduce health risks from existing facilities that emit TACs, by requiring the implementation of all technically and economically feasible risk reduction measures at significant sources of TACs in these facilities. The rule also incorporates the Office of Environmental Health Hazard Assessment (OEHHA's) 2015 Health Risk Assessment Guidelines into its required health risk estimation methodology.

SS21 – New Source Review for Toxics [TAC]: Air District Regulation 2, Rule 5 currently requires a health impact review for new and modified sources that emit TACs in excess of emission trigger level and establishes risk thresholds for mitigation and permit approval. This control measure would update Regulation 2-5 as well as the NSR for TACs. Health risk assessment trigger levels for each toxic air contaminant in the Air District, Regulation 2-5, and the NSR for TACs will be revised based on 2015 guidelines from the ARB and the California Office of Environmental Health Hazard Assessment.

SS22 – Stationary Gas Turbines [NOx]: This control measures aims to further reduce nitrogen oxide (NOx) emissions from stationary gas turbines. In 2006, the Air District imposed emission limits on NOx for gas turbines larger than 250 million British thermal units per hour, requiring installation of SCR so that the turbines met the limit of 9 part per million (ppm). This control measure looks at imposing more stringent emission limits for NOx on medium sized gas turbines between 50-250 million British thermal units per hour.

SS23 – Biogas Flares [NOx]: This control measures aims to reduce secondary emissions of nitrogen oxide (NOx) from flares used to abate organic emissions from all biogas and non-refinery flares, such as solid waste landfills and anaerobic digesters. Under current regulations, flares employed at solid waste landfills are not subject to NSR and secondary pollutants resulting from abatement devices are exempt from the BACT rule but are subject to the less stringent reasonable available control technology (RACT) requirement. This measure looks at imposing the federal lowest achievable emission rate (LAER), similar to BACT, for secondary source emissions from non-refinery flares.

SS24 – Sulfur Content Limits of Liquid Fuels [SO_2, PM]: This control measure seeks to reduce formation of PM, which forms from the precursor sulfur dioxide (SO_2). Air District Regulation 9-1 would be revised to incorporate new limits on sulfur content for gaseous fuels, including diesel. As a co-benefit of limiting sulfur content, PM emissions would be reduced.

SS25 – Coatings, Solvents, and Lubricants and Adhesives [ROG]: This control measure seeks to reduce ROG emissions from miscellaneous coatings, adhesive, solvent, and lubricant categories by lowering certain product ROG limits. Examples of miscellaneous categories to be considered include coatings used in aerospace; adhesives used in a variety of sealing applications; solvents for cleaning and preservation cleaning or graffiti abatement activities; fountain solutions for printing operations; and lubricants used as metalworking fluids to reduce heat and friction to prolong life of tools, improve product quality, and carry away debris. Emission reductions would be achieved by reviewing applicable Air District rules and determining which areas are most likely to contain opportunities for additional emission reductions.

SS26 – Surface Prep and Cleaning Solvents [ROG]: This control measures aims to reduce emissions of ROG that result from surface preparation, cleanup, and equipment cleansing solvents. Amendments to Rules 8-24, 8-29, 8-30, 8-35, 8-38 will be drafted that would reduce the ROG limit for general product cleaning, surface preparation, and equipment cleaning solvents to no more than 50 grams per liter (g/l) or, if compliant products are suitably available, no more than 25 g/l. The control measure would also consider possible removal of ROG emission exemptions from Rule 8-38.

SS27 – Digital Printing Operations [ROG]: This control measure seeks to reduce VOC emissions that arise from digital printing operations. Emissions from the digital printing industry are not currently regulated by the Air District's rule to control emissions from printing presses. Under this control measure, VOC emission from digital printing will be established and feasible control measures will be evaluated such as implementing equipment requirements or add-on controls.

SS28 – LPG, Propane, Butane [ROG]: This control measure seeks to reduce ROG emissions that occur when venting liquid petroleum gases (LPG), propane, and butane storage tanks. The Air District has in place gas tight requirements at stationary sources for a variety of operations, including refineries and bulk terminals. Leakage allowance standards would be set for LPG, propane, and butane tanks and connections, as well as prohibit or control venting during filling of such tanks. Additionally, potential new rules to regulate ROG emissions from LPG storage facilities will be investigated.

SS29 – Asphaltic Concrete [ROG]: Cutback and emulsified asphalts are used to seal and repair roads, parking lots, walkways and airport runways. These asphalts contain solvents that generate ROG emissions. This measure aims to reduce ROG emissions that are from asphaltic concrete and that are precursors to ozone formation. The feasibility of limiting solvent content of emulsified asphalt will be evaluated along with the availability of substitutes to diesel to clean asphalt related equipment.

SS30 – Residential Fan Type Furnaces [NOx]: This control measure seeks to reduce NOx emissions from fan type furnaces. Allowable NOx emission limits on new furnace installation set forth in Regulation 9, Rule 4 will be reduced. Also, Regulation 9-4 will be amended to apply to non-residential furnaces that fall in the same size range. The Air District will also begin the process to adopt the 14 ng/joule NOx limit that is used by the SCAQMD.

SS31 – General PM Emission Limitation [PM]: The aim of this control measure is to reduce the Air District's allowable weight rate limitations for PM, especially PM2.5. There are multiple existing Air District Regulations that limit emissions of PM. Air District rules that consider application of new control technologies to reduce allowable weight rate limitation on existing PM emissions sources will be investigated in an attempt to reduce PM.

SS32 – Emergency Backup Generators [DPM, TAC]: This control measure aims to reduce emissions of TACs, specifically diesel particulate matter (DPM) and black carbon that is emitted from the emergency backup generators through proposed Rule 11-18 (see SS20).

SS33 – Commercial Cooking Equipment [PM]: The aim of this control measure is to reduce PM emissions from commercial cooking operations. Air District Regulation 6, Rule 2 requires installation of certified control devices for chain driven and underfired charbroilers (grills). However, there are currently no control devices that have been certified for underfired charbroilers. Amending Regulation 6, Rule 2 to allow the Air District to approve such control devices would reduce PM emissions.

SS34 – Wood Smoke [PM]: The aim of this control measure is to reduce wood smoke during Winter Spare the Air nights. Air District regulations impose restriction on wood burning but, homes without any other permanent heaters are exempt and can burn wood in an EPA certified wood burning device. Under this control measure, further limits on wood burning, including banning all wood burning during Spare the Air episodes would be evaluated.

SS35 – PM from Bulk Materials, including Coke and Coal [PM]: This control measure aims to reduce public nuisance complaints by reducing PM emissions from petroleum coke and coal handling operations. A new Air District rule will be developed that prevents and controls wind-blown fugitive dust and that creates enforceable visible emission limits to support preventative measures like water sprays or enclosures.

SS36 – PM from Trackout [PM]: The aim of this control measure is to reduce PM emissions from trackout of mud and dirt onto paved public roadways. Trackout of mud and dirt typically occurs from construction sites, bulk material storage, and disturbed surfaces onto public paved roads and from there, vehicles pulverize the mud and dirt into fine particles which are released into the air. A new rule will be developed to prevent trackout and require cleanup if the trackout is significant.

SS37 – PM from Asphalt Operations [PM]: The aim of this control measure is to reduce PM emission from paving asphalt, chip seal asphalt, and roofing asphalt. PM emissions are generated when paving asphalt is loaded into bins on a delivery truck. PM emissions known as “blue smoke” are condensed asphalt aerosols that are generated from chip seal asphalt. A new rule will be developed to prevent blue smoke emissions and will require the use of low fuming asphalt for all roofing asphalt operations.

SS38 – Fugitive Dust [PM]: This control measure seeks to apply fugitive dust requirements and more stringent visible fugitive dust emission limits to a wider variety of potential dust sources. Proposed fugitive dust visible emission limits may be applied to a wider variety of sources like large construction sites, large bulk material operations, and disturbed surfaces larger than one acre. Amendments to Rule 6-1 may also occur to make stricter emission limits for fugitive dust. Air District staff are also developing specific targeted fugitive dust and particulate matter controls for proposed Rule 6-6: Trackout; proposed Rule 6-7: Asphalt Operations, and proposed Rule 6-8: Bulk Material Storage, Handling and Transport, Including Coke and Coal.

SS39 – Enhanced Air Quality Monitoring [All Pollutants]: The aim of this control measure is to provide the Air District with sufficient ambient air monitoring data. This improved data is needed to inform the Air District on its efforts to improve air quality in impacted communities and its air quality planning and modeling programs. The existing monitoring network will be reviewed to ensure that the data is being collected in the impacted communities identified under the Community Air Risk Evaluation (CARE) program. Areas of poor air quality will be identified in collaboration with County Health Departments along with ways to reduce exposure and emissions from local and regional sources.

SS40 – Odors [Odors]: The aim of this control measure is to reduce emissions from odorous compounds and improve the enforceability of Regulation 7. Regulation 7 will be amended with emission reduction strategies that evaluate the complaint threshold that triggers applicability of regulation, identifies source types that can contribute to odor complaints, evaluates methods of detection and monitoring practices of odorous compounds, and amends requirements to ensure best management practices for odorous emissions.

2.7.3 TRANSPORTATION CONTROL MEASURES

Motor vehicles are the largest source of ozone precursors in the Bay Area, so reducing these emissions is essential to regional efforts to attain the State ozone standards and reduce ozone transport. Motor vehicles are also a large source of TACs and GHG emissions. Motor vehicle emissions have dropped substantially over the years thanks to State and national regulations on vehicles and fuels, and motor vehicle emissions are expected to continue to decrease in the future due to turnover in vehicle fleet, as new vehicles that meet stringent emissions standards replace older vehicles. Transportation measures play a critical role in complementing State and national regulatory efforts by reducing motor vehicle use. These measures also provide co-benefits such as improved mobility, enhanced safety, and reduced congestion.

The California CAA emphasizes transportation control measures. California CAA legislative intent states that in developing attainment plans, air districts shall "focus particular attention on reducing the emissions from transportation and arawide emission sources" (Sec. 40910). The California CAA specifically requires air district to "adopt, implement and enforce transportation control measures (TCM)." TCMs are defined as "any strategy to reduce vehicle trips, vehicle use, vehicle miles traveled, vehicle idling, or traffic congestion for the purpose of reducing motor vehicle emissions" (Sec. 40717). TCMs must be sufficient to substantially reduce the rate of increase in vehicle trips and vehicle miles traveled (Sec. 40918). Section 40233 lays out a process for developing a TCM emission reduction target and TCM plan when developing the 1991 Clean Air Plan.

The Air District and MTC in 1991 complied with the required process. Under the California CAA, setting a TCM emission reduction target in subsequent planning cycles is discretionary. While a TCM emissions reduction target was not set in subsequent plans, the TCMs have undergone extensive revision and expansion, as described below.

TR1 – Clean Air Teleworking Initiative [All Pollutants]: The aim of this control measure is to reduce emissions of ozone precursors (ROG and NOx), TACs, and GHG emissions by reducing vehicle use associated with commuting throughout the Bay Area. Vehicle use will be reduced by promoting and increasing the number of employees who telework, and teleworking on Spare the Air Days will be promoted. Outreach and assistance with teleworking will be provided to encourage more employees to utilize telework.

TR2 – Trip Reduction Programs [All Pollutants]: The aim of this control measure is to reduce emissions of ozone precursors (ROG and NOx), TACs, and GHG emissions by reducing commuter trips, vehicle miles traveled, and vehicle emissions. Outreach to employers will take place to encourage the implementation of strategies that encourage their employees to use alternatives to driving alone. The Air District and MTC will continue to implement the regional Commuter Benefits Program, which will contribute to a reduction in commuter trips.

TR3 – Local and Regional Bus Service [All Pollutants]: The aim of this control measure is to reduce emissions of ozone precursors (ROG and NOx), TACs, and GHG emissions by improving bus service throughout the Bay Area. Improving existing transit service of the region's core transit systems and including new bus rapid transit lines in San Francisco, Oakland, and Santa Clara County will reduce vehicle miles traveled which will lead to a reduction in emissions.

TR4 – Local and Regional Rail Service [All Pollutants]: The aim of this control measure is to reduce emissions of ozone precursors (ROG and NOx), TACs, and GHG emissions by sustaining and improving rail service by providing funds to maintain existing rail-cars, stations, and other rail capital assets. Specific projects for implementation include BART extensions, Caltrain electrification, Transbay Transit Center building and rail foundation, Capital Corridor intercity rail service, and Sonoma Marin Area Rail Transit (SMART) District commuter rail project. These rail projects will reduce vehicle miles traveled by commuters which will lead to a reduction in emissions.

TR5 – Transit Efficiency and Use [All Pollutants]: This control measure seeks to reduce emissions of ozone precursors (ROG and NOx), TACs, and GHG emissions by improving transit efficiency and use. Improved efficiency and use will come about from the use of financial incentives, improved real-time transit service information, coordinated fare payment and collection, and improved transit connectivity.

TR6 – Freeway and Arterial Operations [All Pollutants]: This control measure seeks to reduce emissions of ozone precursors (ROG and NOx), TACs, and GHG emissions by improving the efficiency of existing freeways and roadways throughout the Bay Area. Operational improvements include implementing the Freeway Performance Initiative, the Bay Area Freeway Service Patrol, and the Arterial Management Program. Improvements to the efficiency of freeways and roadways means reduced traffic congestion and reduced average time a commuter spends driving which can lead to emission reductions.

TR7 – Safe Routes to Schools and Safe Routes to Transit [All Pollutants]: This control measure seeks to reduce emissions of ozone precursors (ROG and NOx), TACs, and GHG emissions by improving bicycle and pedestrian access to schools and transit throughout the Bay Area. This measure will facilitate safe routes to schools and transit by providing funding to implement safe access routes. Likely projects will include implementation of youth outreach and educational programs to encourage walking and cycling, the construction of bicycle facilities and improvements to pedestrian facilities.

TR8 – Ridesharing, Last-Mile Connection [All Pollutants]: This control measure seeks to reduce emissions of ozone precursors (ROG and NOx), TACs, and GHG emissions by reducing single occupancy vehicle trips through the promotion of rideshare services and incentives. Implementation of the 511 Regional Rideshare Program as well as rideshare program by Congestion Management Agencies will promote ridesharing, which will include marketing rideshare services, operating a rideshare information call center and website, and provide vanpool support services. This measure includes provisions for encouraging car sharing programs. An increased amount of ridesharing will decrease the number of vehicles on the road which leads to a reduction in emissions.

TR9 – Bicycle Access and Pedestrian Facilities [All Pollutants]: This control measure seeks to reduce emissions of ozone precursors (ROG and NOx), TACs, and GHG emissions by improving and sustaining bicycle and pedestrian access and facilities, and encouraging walking and bicycling throughout the Bay Area. Bicycle facilities serving employment sites, educational and cultural facilities, residential areas, shopping districts, and other activity centers will be expanded or improved. Improvements include bike lanes, routes, paths, and bicycle parking facilities along with a bike share pilot project.

TR10 – Land Use Strategies [All Pollutants]: This control measure seeks to reduce emissions of ozone precursors (ROG and NOx), TACs, and GHG emissions by promoting land use patterns, policies, and infrastructure investments that support higher density mixed use, residential, and employment developments. People who live in higher density, mixed use areas take more trips by transit, walking, and bicycle which results in reduced vehicle miles travelled per household, and contributes to better air quality.

TR11 – Value Pricing [All Pollutants]: This control measure seeks to reduce emissions of ozone precursors (ROG and NOx), TACs, and GHG emissions by managing travel demand during congested conditions on Bay Area bridges, in San Francisco, and on other heavily congested freeways and roadways around the Bay Area. Value pricing strategies include tolling on trans-bay bridges, cordon pricing roads and auto pricing options such as a VMT fee or pay-at-the-pump auto insurance.

TR12 – Smart Driving [All Pollutants]: Smart Driving is a set of strategies and techniques that maximize fuel efficiency and reduce emissions by improving driving habits and vehicle maintenance. This control measure seeks to reduce emissions of ozone precursors (ROG and NOx), TACs, and GHG emissions by educating drivers and improving vehicle maintenance. Implementing a smart driving pilot program that includes installing temporary in-vehicle devices that display vehicle gas mileage in real time, a social marketing campaign, vehicle maintenance tips and trip planning tools through 511.org would lead to emission reductions from maximized fuel efficiency.

TR13 – Parking Policies [All Pollutants]: Parking policies can have a profound impact on vehicle travel and mode choice, as well as land use patterns. This control measure seeks to reduce emissions of ozone precursors (ROG and NOx), TACs, and GHG emissions by implementing parking policies that support in-fill and transit oriented development and reduce vehicle miles traveled. The Air District will take action at the regional level to implement parking policies that will benefit air quality and encourage support of local agency parking policies to reduce motor vehicle travel and promote focused growth.

TR14 – Cars and Light Trucks [All Pollutants]: This control measure seeks to reduce emissions of ozone precursors (ROG and NOx), TACs, and GHG emissions by providing incentives for the purchase of Zero Emission Vehicles (ZEVs) and Plug-In Electric Vehicles (PEVs) and light-duty trucks. The use of ZEVs and PEVs, comprising both passenger vehicles and light duty trucks, will be promoted within the Bay Area by the Air District, MTC, as well as the local counties and cities.

TR15 – Public Outreach and Education [All Pollutants]: Public outreach is an effective method to encourage Bay Area residents to make choices that benefit air quality. Examples of outreach include campaigns to educate the public about the health effects of air pollution, the benefits of reducing motor vehicle trips, and smart driving strategies. This control measure seeks to reduce emissions of ozone precursors (ROG and NOx), TACs, and GHG emissions through various public outreach methods like Spare the Air Every Day Campaign, including Spare the Air alerts, employer program, and community resource teams, a PEV Outreach campaign and the Spare the Air Youth Program.

TR16 – Indirect Source Review [All Pollutants]: This control measure seeks to reduce emissions of ozone precursors (ROG and NOx), TACs, and GHG emissions by reducing construction and operational emissions associated with new or modified land uses. This measure is intended to address potential increases in air pollutant emissions from economic and population growth in the region. Indirect sources are developments that generate or attract motor vehicle trips, thus “indirectly” causing air pollution from vehicles and area sources (e.g. furnaces and water heaters). A new rule may be developed that sets air quality performance standards for new or modified developments.

TR17 – Planes [NOx]: This control measure aims to reduce emissions of NOx through the development and use of cleaner aircraft engines, improvements in engine efficiencies and increased use of jet fuel derived from renewable sources. This measure incorporates efforts from the Federal Aviation Administration's Continuous Lower Energy, Emissions, and Noise (CLEEN) Program. Goals include the development of new commercial aircraft engines by 2023-2025 that would emit 60 to 75 percent less NOx emissions than current ones and would demonstrate feasibility of jet fuel derived from crops and other renewable resources.

TR18 – Goods Movement [All Pollutants]: This control measure aims to reduce emissions of ozone precursors (ROG and NOx), TACs, and GHG emissions associated with goods movement. Emissions reductions will come about from funding of regional programs to update infrastructure and the Regional Goods Movement Plan, along with participation in the regional Goods Movement Collaborative. Investing in the various trade corridors in the Bay Area will allow for the development of better technologies with fewer emissions.

TR19 – Medium- and Heavy-Duty Trucks [All Pollutants]: This control measure aims to reduce emissions of ozone precursors (ROG and NOx), TACs, GHG emissions, and PM by replacing older, higher emissions trucks and engines. To encourage replacement of high emissions trucks, the Air District will directly provide incentives for the purchase of new trucks that meet or exceed ARB's 2010 emission standards for heavy-duty engines and for new trucks with hybrid drive trains. The Air District also will work with industries and the ARB to demonstrate battery electric and hydrogen fuel cell trucks.

TR20 – Ocean Going Vessels [All Pollutants]: This control measure aims to reduce emissions of ozone precursors (ROG and NOx), TACs, and GHG emissions through the development and use of cleaner engines in ocean going marine vessels. The Air District is trying to replicate the Green Ship Program in place at the Ports of Los Angeles and Long Beach. The program provides incentives for cleaner Tier 2 and Tier 3 vessels to call at the ports. The Air District also will work to provide financial support on a case-by-case basis for projects that reduce emissions from ships while at berth.

TR21 – Commercial Harbor Craft [All Pollutants]: This control measure aims to reduce emissions of ozone precursors (ROG and NOx), TACs, GHG, and PM emissions through the use of cleaner commercial harbor craft engines and control technologies. Control technologies that could be deployed on commercial harbor craft would reduce emissions beyond what is required by the statewide Harbor Craft Regulation. Technologies that may be utilized include wind assist, hybrid systems, the use of alternative fuels, retrofit of older marine engines with selective catalytic converters, and diesel particulate filters.

TR22 – Construction and Farming Equipment [All Pollutants]: This control measure seeks to reduce emissions of ozone precursors (ROG and NOx), TACs, GHG, and PM emissions through the installation of abatement devices on existing diesel equipment and replacement of older diesel equipment. The Air District will offer financial incentives between 2015 and 2025 to retrofit engines with diesel particulate filters or upgrade to equipment with electric of Tier IV off-road engines; work with ARB, the California Energy Commission and others to develop more fuel efficient off-road engines and drive-trains; and work with contractors, freight handlers, and farmers to encourage the use of renewable electricity and renewable fuels in applicable equipment.

TR23 – Lawn Care Equipment [All Pollutants]: Use of gasoline lawn mowers and leaf blowers contribute to air pollution, primarily through the release of ROGs and PM. This control measure aims to reduce ROG and PM emissions through continuation of the Commercial Lawn and Garden Equipment Replacement Program and through the establishment of a Residential Lawn and Garden Equipment Replacement Program. While more stringent emission standards have reduced pollution from lawnmowers and leaf blowers, a sufficient number of the older two-stroke and four-stroke engines remain in use. The Air District has pursued and will continue to pursue programs that target the removal of the older engines through exchange programs, specifically those targeted at commercial lawn mowers, backpack style leaf blowers, and residential lawn care equipment.

2.7.4 BUILDING CONTROL MEASURES

BL1 – Green Buildings [All Pollutants]: This proposed control measure would seek to increase energy efficiency by promoting the use of renewable energy and decarbonizing existing end uses in both existing and future buildings. In 2015, Senate Bill 350 was passed calling for a doubling of energy efficiency in existing buildings throughout the state. The control measure will help to meet the energy efficiency goal and the Air District's regional GHG reduction target by financing energy saving improvements with rebates, tax incentives, and the Property Assessed Clean Energy (PACE) programs. Energy efficiency upgrades will decrease electricity use and decarbonize buildings by moving away from natural gas appliances will help reduce GHG and TAC emissions.

BL2 – Decarbonize Buildings [All Pollutants]: This control measure seeks to limit the installation of space- and water-heating systems and appliances powered by fossil fuels which contribute to GHG and TAC emissions. Switching to electricity or renewable energy technologies to heat space and water can greatly reduce or eliminate direct emissions from buildings. By developing and promoting model policies and best practices that limit fossil fuel based appliances, GHG and TAC emissions will be reduced. Furthermore, providing incentives and resources to property owners for non-fossil fuel appliances will add to emission reductions.

BL3 – Market-Based Solutions [All Pollutants]: This control measures aims to facilitate market-based solutions from investors and private companies as they develop innovative solutions for building related energy. Incentivizing innovation of building-related energy efficiency technology through research grants, competitions, and project funding will foster market-based solutions. These market based solutions will help to solve energy related problems and contribute to GHG and TAC emission reductions from buildings.

BL4 – Urban Heat Islands [All Pollutants]: This control measures seeks to reduce GHG emissions by reducing the "urban heat island" (UHI) phenomenon. The application of "cool roofing" and "cool paving" technologies, along with an increase in the prevalence of urban forests and vegetation will help to reduce GHG. Cooling roofing technologies work by increasing a roof's solar reflectance value (albedo) with reflective paint, coatings, membranes, and tiles. This would reduce the amount of solar radiation absorbed, leading to less energy needed to cool down the house. Cool paving increases the albedo of paved surfaces, like a parking lot, with the use of coatings and paving mixes and reduces the surface temperature of the paved surface. Urban forests not only reduce the amount of solar energy absorbed and stored by pavements and roofs, but they also can contribute to better air quality. Development and promotion of these practices will help to mitigate the UHI phenomenon and reduce GHG emissions.

2.7.5 ENERGY CONTROL MEASURES

EN1 – Decarbonize Electricity Production [All Pollutants]: Electricity is generated through a variety of sources, including fossil fuels, renewable energy, or nuclear. Cogeneration, the simultaneous generation of useful heat and electricity from a single fuel source, is also used. This measure focuses on lowering carbon emissions by changing fuel sources used in electricity generation. By engaging with PG&E, municipal electric utilities, and CCEs, the amount of renewable energy contributing to the production of electricity can be maximized. As more renewable energy sources are utilized, the amount of fossil fuel use will decrease which, in turn, will lead to a decrease in emissions of all pollutants associated with electricity generation.

EN2 – Decrease Electricity Demand [All Pollutants]: This measure seeks to decrease energy consumption in the Bay Area through increased efficiency and conservation. Providing education and outreach about energy efficiency programs and financing available to residents and businesses in the bay area will increase consumer awareness and decrease energy consumption. Tracking energy use through energy providers and municipal utilities will help with energy conservation. With less energy generation required, there will be a decrease in emissions of all pollutants associated with electricity generation.

2.7.6 AGRICULTURE CONTROL MEASURES

AG1 – Agriculture Guidance and Leadership [GHG]: This control measure seeks to reduce GHGs from the agriculture sector by working to obtain funding for on-farm GHG reduction activities, promoting carbon farm plans, providing guidance to local governments on including carbon-based conservation measures in local climate action plans, reducing conversion of agricultural lands to urban/suburban uses, and conducting outreach to agricultural businesses on best practices. This measure is also intended to emphasize and promote the opportunities for GHG capture, including carbon sequestration and biogas recovery, and the associated economic and environmental co-benefits. Co-benefits from this measure include economic benefits from increased forage production, improved soil quality, and a decreased risk of water and wind erosion due to the promotion of carbon farm plans.

AG2 – Dairy Digesters [GHG]: This control measure would seek to capture methane through the implementation of dairy digester facilities (also known as biogas recovery). Dairy digester facilities will allow not only for a reduction in methane emissions but also generate renewable energy by methane capture. By working with the animal farming community to promote the use of digester systems and to identify and overcome potential barriers to implementation, methane emissions will be reduced.

AG3 – Enteric Fermentation [GHG]: This control measure seeks to develop and implement best practices to reduce methane emissions that are produced as a result of enteric fermentation. The amount of methane produced by enteric fertilization is influenced by animal and feed characteristics such as quantity of feed and efficiency by which an animal converts feed to product. Best practices include grazing management methods as well as diet manipulation, increasing animal intake of dietary oils (such as cottonseed, sunflower or coconut). Collaboration with state agencies and working groups will identify and circulate best practices to the agricultural community on management of methane emissions from enteric fermentation.

AG4 – Livestock Waste [PM, ROG, NH_3]: This control measure seeks to require best management practices for livestock waste emissions that are already in effect in the San Joaquin Valley Air Pollution Control District (SJVAPCD) and the SCAQMD. This control measure seeks to investigate the number and size of CAFs in operation in the Bay Area, and quantify the ammonia and methane emission reduction potential for this industry. Examples of best management practices that could be implemented include the application of acidifiers, like sodium bisulfate, to mitigate ammonia spikes, handling methods of animal waste products, and control measures that minimize emissions of ROC and PM.

2.7.6 NATURAL AND WORKING LANDS CONTROL MEASURES

NW1 – Carbon Sequestering in Rangelands [GHG]: This control measure seeks to provide technical and research assistance to local governments, regional agencies, and private owners of rangelands to increase carbon sequestration in rangelands across the Bay Area. Carbon sequestration is the storage of carbon in oceans, soils, vegetation, and geologic formations. The amount and length of time carbon is stored is determined mainly by how the soil is managed. One method that has shown to increase carbon sequestration is the application of a layer of compost on grazed rangelands. By working with the Marin Carbon Project to develop best practices for soil management, CO_2 emissions can be reduced through an increase in carbon sequestration. In addition, off-site mitigation of GHG emissions may occur through carbon sequestration projects using the Marin Carbon Project GHG reduction protocol in Air District CEQA guidance and comments, and the CAPCOA GHG Reduction Exchange or other third-party protocols approved for use by the Air District.

NW2 – Urban Tree Planting [Criteria Pollutants, GHG]: This control measure promotes the planting of trees in urbanized settings to capitalize on benefits provided by these trees. Such benefits include: shading to reduce both the "urban heat island" phenomenon and the need for cooling energy needs, and the absorption of ambient criteria air pollutants and carbon dioxide. Buildings and paved surfaces in urban areas absorb solar energy into roads and rooftops, causing an increase in surface temperature and structures to radiate heat. Increasing tree canopy in such areas decreases the amount of solar energy absorbed, leading to a smaller increase in temperature increase and less of a need for cooling methods. Developing ordinances for urban tree planning can lead to reductions in criteria pollutant emissions and GHG emissions.

NW3 – Carbon Sequestration in Wetlands [GHG]: By providing technical and research assistance, policy support, and incentive funding to local governments and agencies, this control measure aims to increase carbon sequestration in wetlands in the San Francisco Bay through preservation and restoration of wetlands. Carbon sequestration is the storage of carbon in oceans, soils, vegetation, and geologic formations. Ensuring the preservation and restoration of wetlands in the Bay Area will reduce emissions of CO_2 that result when wetlands are destroyed and/or degraded as well as increase the uptake and sequestration of atmospheric CO_2 within these habitats when they are re-established and protected. Increasing uptake and decreasing the amount of CO_2 released will cause an overall reduction in CO_2 emissions.

2.7.7 WASTE CONTROL MEASURES

WA1 - Landfills [GHG, ROG, TACs]: This control measure seeks reductions in emissions of methane and ROGs from landfills. Reductions will be accomplished by increasing standards for landfill gas collection control devices and fugitive leaks. Regulation 8, Rule 34 will also be revised to improve consistency with State and Federal rules governing solid waste disposal sites. Stricter standards and regulations will decrease the amount of methane and ROG emissions at landfills.

WA2 – Composting and Anaerobic Digestion [GHG, ROG, PM]: Due to recent changes in policies and state law surrounding waste management in California, more organic waste is being diverted from landfills to either composting, anaerobic digestion, or a combination of the two. This control measure aims to reduce emissions from anaerobic digesters and composting operations by requiring best management practices. These best management practices are derived from measures already adopted by the SCAQMD and the SJVAPCD. CalRecycle guidance publications may provide additional measures for anaerobic digester facilities. Implementation of best management practices will help to minimize emissions of GHG and ROG.

WA3 – Green Waste Diversion [All Pollutants]: This control measure seeks to reduce the total amount of green waste being disposed in landfills by supporting the diversion of green waste to other uses. Policies that would develop a zero waste goal for a community, and implement programs to achieve the goal, and require large commercial and industrial facilities to use compost in their landscaping operations could reduce green waste going to landfills. Policies could also incentivize programs for commercial food donation to composting facilities and foodbanks. By keeping green waste out of landfills and waste streams, methane gas and other GHG emissions are reduced due to a smaller amount of anaerobic decomposition taking place at landfills.

WA4 – Recycling and Waste Reduction [GHG]: This control measure seeks to reduce GHG emissions by reducing the amount of solid waste sent to landfills. Strengthening recycling programs and developing additional waste reduction strategies will contribute to a decrease in solid waste. Promoting the reuse of materials such as asphalt and concrete in construction and repaving projects will further reduce solid waste. Promotion of community-wide zero waste goals is also expected to contribute to an increase in recycling which will decrease solid waste being sent to landfills. A decrease in solid waste sent to landfills will cause a decrease in GHG emissions.

2.7.8 WATER CONTROL MEASURES

WR1 – Limit GHGs from POTWs [GHG, ROG, TACs]: This measure aims to reduce direct emissions of GHGs related to the water and wastewater treatment sector. The Air District will work with publicly owned treatment works (POTWs) to quantify GHG emissions at POTWs, streamline the permitting process of biogas recovery at POTWs, and explore rulemaking to reduce directly emitted GHGs within POTWs. Furthermore, the Air District will work to obtain funding for the development of green infrastructure in POTWs.

WR2 – Support Water Conservation [GHG]: The purpose of this control measure is to reduce indirect GHG emissions associated with the electricity use required in the water and wastewater treatment process and to promote reduced water consumption. The Air District will support local government efforts to achieve the water use reduction goal by disseminating best practices of water consumption reduction and on-site water recycling and incorporating water conservation outreach into existing outreach programs. Best practices for water use will be incorporated into local plan guidance, CEQA guidance, and other resources for cities and countries within the Air District.

2.7.9 SUPER-GHG MEASURES

SL1 – Super-GHGs [GHG, including black carbon]: Super-GHGs refer to a diverse group of compounds that can affect climate change by absorbing or reflecting solar radiation, but have a relatively short lifetime in the atmosphere and a high global warming potential (GWP). This control measure seeks to reduce emissions of super GHGs, specifically, methane, black carbon, and fluorinated gases, to restrain global warming in the near future. By reducing the amount of waste material entering landfills through methods such as local ordinances or the use of biogas recovery, the amount of methane emissions can be reduced. Intensifying efforts to reduce wood burning along with incentivizing reduced emissions from heavy duty vehicles will contribute to a reduction in black carbon emissions. Regulating the servicing of existing air conditioning units as well as adopting more stringent fluorinated gas regulations will reduce these gas emissions. The reduction of methane, black carbon, and fluorinated gas emissions, all super-GHGs, will help to curb global warming in the near future.

SL2 – Guidance for Local Planners [GHG]: This control measure seeks to encourage local agencies to include actions to reduce super-GHG emissions in their climate plans and programs. Information on the current and projected emissions of super-GHGs as well as their contribution to overall GHG inventory will be provided to local agencies. With this information, potential policies and measures can be suggested that will reduce super-GHG emissions. Furthermore, the progress in the adoption of super-GHG reduction measures in local plans will be tracked so that additional actions or measures can be implemented if needed.

SL3 – GHG Monitoring and Emissions Measurement Network [GHG]: This control measure facilitates the Air District's efforts to institute a fixed site GHG monitoring network across the San Francisco Bay Area. A network such as this will allow background levels of GHGs such as methane and CO_2 to be established and will allow increases in concentrations to be observed. Measuring GHGs facilitates an evaluation of the efficacy of policy measures, regulatory actions, and other GHG specific control measures adopted by the Air District. Having detailed emission levels will allow for better policies to be implemented which will lead to a reduction in GHG emissions across the Air District.

2.7.10 EMISSION REDUCTIONS

Implementation of the 85 control measures is expected to result in overall emission reductions in the Bay Area. A summary of emission reductions from the control measures in the 2017 Plan is provided in Table H-1 of Appendix H of the 2017 Plan. Emission reductions could not be estimated for all of the control measures at this time due to a variety of reasons, as explained in further detail in the Appendix H of the 2017 Plan and Chapter 3.1 of this Draft EIR. The Air District will not move forward with implementation of any of the 85 measures if at the time of implementation, the air quality benefits of the control measure cannot be ascertained.

For criteria pollutants, by the year 2030, the control strategy is expected to reduce emissions of ROG by approximately 23,000 lbs per day, emissions of NO_x by nearly 19,000 lbs per day, emissions of $PM_{2.5}$ by approximately 6,000 lbs per day, and emissions of SO_2 by over 16,500 lbs per day.

In terms of protecting the climate, the control strategy is estimated to reduce approximately 4.4 million metric tons (MMT) of CO_2e per year by 2030, based on 100-year GWP factors. The estimated emissions reductions increase to 5.6 MMT of CO_2e per year by 2030 when the emissions reductions are based on 20-year GWP factors. This estimate includes only those measures for which potential GHG emissions reductions can be quantified at this time.

Several of the 85 control measures in the 2017 Plan will be implemented primarily or exclusively by the Air District's partner agencies such as the Metropolitan Transportation Commission (MTC) and the Association of Bay Area Governments (ABAG). These control measures include MTC and ABAG actions and activities related to implementing Plan Bay Area, the Regional Transportation Plan and SB 375 the Sustainability Communities Strategy. The 2017 Plan includes these control measures because they further the same clean air and climate protection goals that the Air District is seeking to achieve under the 2017 Plan. However, these measures are not dependent on approval of the 2017 Plan, and the Air District's approval for the 2017 Plan will not authorize or commit those agencies to any action. As these actions and activities by independent agencies are not Air District actions and will occur independently of the Air District's approval of the 2017 Plan, they are not direct or indirect effects resulting from approval of the 2017 Plan that must be analyzed in the Draft EIR. Accordingly, Chapter 3 does not address implementation actions by other agencies independent of the Air District's implementation actions under the 2017 Plan.

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CHAPTER 3 ENVIRONMENTAL SETTING, IMPACTS AND MITIGATION MEASURES

3 ENVIRONMENTAL SETTING, IMPACTS AND MITIGATION MEASURES

3.1 INTRODUCTION

This chapter of the Draft EIR describes the existing environmental setting in the Bay Area, analyzes the potential environmental impacts of the 2017 Plan, and recommends mitigation measures (when significant environmental impacts have been identified). The chapter provides this analysis for each of the environmental areas identified in the Initial Study (see Appendix A), which are:

- Air quality;
- Climate change and greenhouse gas emissions;
- Hazards;
- Hydrology and water quality;
- Noise;
- Transportation and traffic; and
- Utilities and service systems.

Included for each impact category is a discussion of the environmental setting, significance criteria, whether the 2017 Plan will result in any significant impacts (either from the Plan individually or cumulatively in conjunction with other projects), feasible project-specific mitigation (if necessary and available), and impacts remaining after mitigation (if any).

CEQA Guidelines § 15360 (Public Resources Code Section 21060.5) defines "environment" as "the physical conditions that exist within the area which will be affected by a proposed project including land, air, water, minerals, flora, fauna, ambient noise, and objects of historical or aesthetic significance." CEQA Guidelines § 15125(a) requires that an EIR include a description of the physical environmental conditions in the vicinity of the project, as they exist at the time the notice of preparation is published from both a local and regional perspective. This environmental setting will normally constitute the baseline physical conditions by which a lead agency determines whether an impact is significant. The description of the environmental setting is intended to be no longer than is necessary to gain an understanding of the significant effects of the proposed project and its alternatives.

The CEQA Guidelines also require the EIR to identify significant environmental effects that may result from a proposed project (CEQA Guidelines §15126.2(a)). Direct and indirect significant effects of a project on the environment must be identified and described, with consideration given to both short- and long-term impacts. If significant adverse environmental impacts are identified, the CEQA Guidelines require a discussion of measures that could either avoid or substantially reduce any adverse environmental impacts to the greatest extent feasible (CEQA Guidelines §15126.4). The analyses in this chapter describe the potential for significant adverse impacts and identify mitigation measures where appropriate.

This EIR is a program EIR, as it examines the environmental effects of a proposed continuing ongoing regulatory program that the Air District will implement over the next several years. Program EIRs are governed by Section 15168 of the CEQA Guidelines, among other related provisions. Program EIRs typically involve a lesser degree of specificity than other types of EIRs (e.g., an EIR for a land-use development project), as the degree of specificity required in an EIR corresponds to the degree of specificity involved in the underlying activity described in the EIR (CEQA Guidelines §15146). Because the 2017 Plan describes the Air District's proposed regulatory program in relatively general terms, the EIR's analysis of the associated impacts is necessarily relatively general as well. The Air District has nevertheless endeavored to evaluate the impacts with as much specificity as the nature of the Plan will allow.

3.1.1. OVERVIEW OF ANALYTICAL APPROACH

The 2017 Plan is designed as a comprehensive roadmap for the Air District's efforts over the next few years to reduce air pollution and protect public health and the global climate. The 2017 Plan focuses in particular on reducing emissions of ozone-forming pollutants in order to fulfill state ozone air quality planning requirements; on protecting public health by reducing emissions of ozone-forming pollutants, fine particulate matter, and toxic air contaminants; and on developing a regional climate protection strategy by reducing greenhouse gas emissions from a wide variety of sources. In aggregate, by 2030 implementation of the control measures in the 2017 Plan is expected to reduce ozone forming pollutants by approximately 7,700 tons per day, particulate matter by 1,100 tons per day, and greenhouse gases by 5.6 MMT CO_2e based on 20-year global warming potential.

To implement the Plan, the Air District will draw on the full repertoire of tools and resources at its disposal. This repertoire includes the District's principal regulatory tool, which is its rulemaking authority granted to it under the California Health & Safety Code to adopt mandatory regulations requiring stationary-source facilities to take action to reduce their air emissions. It also includes the District's grants and incentives programs, which provide monetary incentives for implementing voluntary actions to reduce emissions. And it also includes the District's role in promoting sound policy development and healthy air quality choices throughout all sectors of our economy and society. This last tool encompasses efforts such as providing technical support to other agencies as they develop and implement their own policies and programs to help achieve clean air; promoting best practices by developing model ordinances, guidance documents, and the like; outreach and education efforts to engage with community groups and other organizations; and advocacy in support of legislative and regulatory action at the federal and state levels in order to promote the District's air quality, public health, and climate protection goals.

The specific actions and activities that the Air District is proposing to take to implement the 2017 Plan are set forth in the Plan's control strategy described in Chapter 5 of the Plan, and in the individual control measures that make up the control strategy outlined in detail in Volume II of the 2017 Plan. To facilitate the analysis of the potential impacts from these implementation actions, the District has organized them into three categories: 1) stationary-source regulatory actions; 2) grants and incentive actions; and 3) technical support, educational outreach, and advocacy actions. The following discussion outlines each of these categories in general. The subsequent sections of the chapter then evaluate the impacts in each specific environmental resource area.

3.1.2 STATIONARY-SOURCE REGULATORY ACTIONS

The principal type of activity that the Air District will engage in under the 2017 Plan is to explore, research and/or adopt mandatory regulations and rules requiring stationary-source facilities to take actions to reduce their air emissions, pursuant to the District's rulemaking authority under the California Health & Safety Code. Taken together, the enhanced rules and regulations that the Air District will develop under the 2017 Plan will substantially reduce air emissions in the Bay Area. These proposed regulatory measures need to be evaluated to determine whether they could also result in any significant ancillary adverse impacts, however. The Draft EIR provides this analysis.

3.1.2.1 Stationary Equipment That Will Be Affected by Proposed Regulatory Measures

The 2017 Plan proposes a number of control measures that would reduce emissions of PM, SO_2, ROGs, TACs, and GHGs from refineries and other stationary sources in the Bay Area. Table 3.1-1 lists the types of sources that are large emitters of SO_2, $PM_{2.5}$, TACs and would be targeted for further emissions controls under the 2017 Plan. These sources may emit one pollutant or any combination of pollutants. Table 3.1-1 also lists the most common emission control technologies used to abate SO_2, $PM_{2.5}$ and TAC emission from these sources. In some cases, control equipment identified below may reduce one or more pollutants. The subsequent discussions briefly summarize each type of emissions source and control technology.

TABLE 3.1-1
Control Technologies by Source Category and Pollutant

	Pollutant		
Equipment Type	SO_2	$PM_{2.5}$	TAC
Boiler	FGT	Baghouse; ESP	
Diesel Internal Combustion Engine		DPF, DOC, Electric Motor	DPF, DOC, Electric Motor
Fluid Catalytic Cracking Unit	WGS, SRA	Cyclone, ESP	
Petroleum Coke Calciner	WGS	Baghouse	Baghouse
Process Heater	FGT	Baghouse; ESP	
Sulfur Recovery Unit/ Tail Gas Treating Unit	WGS; SOC	WGS	
Fugitive Emission Sources			Afterburner, carbon adsorption, inspection/ maintenance

DPF = Diesel Particulate Filter; DOC = Diesel Oxidation Catalyst; ESP = Electrostatic Precipitator: FGT = Flue Gas Treatment; SOC = SOx Oxidation Catalyst; SRA = SOx Reducing Additives; SET = Steam Ejector Technology; WGS = Wet Gas Scrubber

3.1.2.1.1 Fluid Catalytic Cracking Units (FCCUs)

The purpose of an FCCU at a refinery is to convert or "crack" heavy oils (hydrocarbons), with the assistance of a catalyst, into gasoline and lighter petroleum products. Each FCCU consists of three main components: a reaction chamber, a catalyst regenerator and a fractionator. Crude enters the reaction chamber, where it is mixed with a catalyst, typically a fine powder, under high heat. A chemical reaction occurs that converts the heavy oil liquid into a cracked hydrocarbon vapor mixed with catalyst. The cracked hydrocarbon vapor is routed to a distillation column or fractionator for further separation into lighter hydrocarbon components. Eventually, the catalyst becomes inactive or spent and is regenerated, first by removing oil residue using steam stripping. The spent catalyst is then sent to the catalyst regenerator where hot air burns the coke layer off of the surface of each catalyst particle to produce reactivated or regenerated catalyst. Subsequently, the regenerated catalyst is cycled back to the reaction chamber and mixed with more fresh heavy liquid oil feed.

FCCUs emit substantial amounts of $PM_{2.5}$, and they are also major sources of precursor pollutants that form secondary particulate matter. Secondary particulate matter is formed in the atmosphere as a result of one or several chemical reactions that cause physical transformations of gaseous precursors. Sulfates and nitrates are the two most common secondary particulates in the atmosphere. Other typical emissions from FCCUs are SO_2, sulfur trioxide (SO_3), NO_2, nitric oxide (NO), and ammonia slip (NH_3).

The primary source of SO_2 and $PM_{2.5}$ emissions from the catalytic cracking process is the catalyst regenerator unit. (The waste heat from the regenerator unit also provides much of the heat required by the catalytic cracking process.) During the cracking process, coke is deposited on the surface of the catalyst, deactivating the material. The catalyst is regenerated by burning off the coke at high temperatures. The flue gas from the regenerator unit contains SO_2, $PM_{2.5}$, and catalyst fines (as well NOx). In addition, organic metals in heavy gas oils can be deposited on the coke formed in the FCCU. When the coke is burned in the regenerator unit, these metals then deposit on the catalyst. A portion of this catalyst is emitted from the FCC as particulates containing these metal compounds.

3.1.2.1.2 Boilers and Process Heaters

Boilers are used in a wide variety of industrial applications, including the food industry, the paper and pulp industry, the chemical industry, and petroleum refining. In general, boilers use a fuel to heat water and produce steam, which can then be used to produce heat or electricity, or to directly power a variety of processes. The combustion needed to operate the boiler usually produces various types of air pollutants and greenhouse gases, although there is some variation because of the different types of fuels that can be used. Most small boilers are powered by natural gas, while larger boilers often run on the byproducts of the manufacturing process in which they are used. The food industry uses many smaller natural gas boilers, while oil refineries use relatively few, very large boilers. Because refinery boilers are among the largest ones operating in the Bay Area, these are discussed further below.

Refinery boilers generate steam that is used primarily for heating and separating hydrocarbon streams and, to a lesser extent, for producing electricity. A similar technology used at refineries is process heaters, which are enclosed devices in which solid, liquid or gaseous fuels are combusted for the purpose of heating a process material (e.g., crude oil). Refinery process heaters and boilers are used extensively throughout various processes in refinery operations such as distillation, hydrotreating, fluid catalytic cracking, alkylation, reforming, and delayed coking.

Both refinery process heaters and boilers are primarily fueled by refinery gas, one of several products generated at a refinery. In addition, most refinery process heaters and boilers are designed to also operate on natural gas. When used for heating, the steam usually heats the petroleum indirectly in heat exchangers and returns to the boiler. In direct contact operations, the steam serves as a stripping medium or a process fluid. Refinery process heaters and boilers are a major source of SO_2, $PM_{2.5}$, and TAC emissions at most refineries.

3.1.2.1.3 Sulfur Recovery Units and Tail Gas Units (SRU/TGUs)

Because sulfur is a naturally occurring and undesirable component of crude oil, refineries employ a sulfur recovery system to maximize sulfur removal, which also generates SO_2 emissions. A typical sulfur removal or recovery system will include a sulfur recovery unit (e.g., Claus unit) followed by a tail gas treatment unit (e.g., amine treating) for maximum removal of hydrogen sulfide (H_2S). A Claus unit consists of a reactor, catalytic converters and condensers. Two chemical reactions occur in a Claus unit. The first reaction occurs in the reactor, where a portion of H_2S reacts with air to form SO_2, followed by a second reaction in the catalytic converters where SO_2 reacts with H_2S to form liquid elemental sulfur. The combination of two converters with two condensers in series will generally remove as much as 95 percent of the sulfur from the incoming acid gas.

To recover the remaining sulfur compounds after the final pass through the last condenser, the gas is sent to a tail gas treatment process such as a SCOT or Wellman-Lord where the sulfur compounds in the tail gas are converted to H_2S. The H_2S is absorbed by a solution of amine in the H_2S absorber, steam-stripped from the absorbent solution in the H_2S stripper, concentrated, and recycled to the front end of the sulfur recovery unit. The residual H_2S in the treated gas from the absorber is typically vented to a thermal oxidizer where it is oxidized to SO_2 before venting to the atmosphere.

The Wellman-Lord tail gas treatment process is a process where the sulfur compounds in the tail gas are first incinerated to oxidize to SO_2. After the incinerator, the tail gas enters a SO_2 absorber, where the SO_2 is absorbed in a sodium sulfite (Na_2SO_3) solution to form sodium bisulfite ($NaHSO_3$) and sodium pyrosulfate ($Na_2S_2O_5$). The absorbent, rich in SO_2, is then stripped and the SO_2 is recycled back to the beginning of the Claus unit. The residual sulfur compounds in the treated tail gas from the SO_2 absorber are then vented to a thermal oxidizer where they are oxidized to SO_2 before venting to the atmosphere.

3.1.2.1.4 Petroleum Coke Calciner

Petroleum coke is processed in a delayed coker unit (described below) to generate a carbonaceous solid referred to as "green coke," a commodity. To improve the quality of the product, if the green coke has a low metals content, it will be sent to a calciner to make calcined petroleum coke. Calcined petroleum coke can be used to make anodes for the aluminum, steel, and titanium smelting industry. If the green coke has a high metals content, it is used as a fuel grade coke by the fuel, cement, steel, calciner and specialty chemicals industries.

The process of making calcined petroleum coke begins when the green coke feed from the delayed coker unit is screened and transported to the calciner unit where it is stored in a covered coke storage barn. The screened and dried green coke is introduced into the top end of a rotary kiln and is tumbled by rotation under high temperatures that range between 2,000 and 2,500 degrees Fahrenheit (^oF). The rotary kiln relies on gravity to move coke through the kiln countercurrent to a hot stream of combustion air produced by the combustion of natural gas or fuel oil. As the green coke flows to the bottom of the kiln, it rests in the kiln for approximately one additional hour to eliminate any remaining moisture, impurities, and hydrocarbons. Once discharged from the kiln, the calcined coke is dropped into a cooling chamber, where it is quenched with water, treated with de-dusting agents to minimize dust, and carried by conveyors to storage tanks. SO_2, $PM_{2.5}$, and TAC emissions are generated when the green coke is processed under high heat conditions in the rotary kiln.

3.1.2.1.5 Diesel Internal Combustion Engines (ICEs)

Diesel ICEs are often used to provide electricity in areas of a large industrial facility that may not have access to electricity power lines from the local electric utility or other onsite sources of electricity, used as a backup source of electricity in the event of a power outage, or as a means of pumping liquids between different refinery equipment. Four-stroke cycle ICEs are more commonly used than two-stroke ICEs. Diesel ICEs operate by drawing air into a cylinder and then injecting fuel after the air has been compressed. Diesel ICEs rely on high temperature alone for ignition. Diesel ICEs are often referred to as compression ignition engines because the high temperature is the result of compressing air above the piston as it travels upward. The power output of a diesel ICE is controlled by varying the amount of fuel injected into the air, thereby, varying the fuel-air ratio. The main advantage of using a diesel engine is its high thermal efficiency[1], which can exceed 50 percent. However, diesel ICE exhaust tends to be high in NO_x and particulate emissions, both visible (smoke) and invisible. Diesel particulates were also classified as a TAC by ARB in in 1998. Other diesel exhaust pollutants may include unburned or partially burned hydrocarbons and carbon monoxide.

[1] Thermal efficiency is defined as the amount of work produced by the engine divided by the amount of chemical energy in the fuel that can be released through combustion. This chemical energy is often referred to as net heating value or heat of combustion of the fuel.

3.1.2.1.6 Fugitive Emissions Sources

Fugitive emissions occur when gases or vapors are unintentionally released, often through leaks. For example, fugitive emissions can result from equipment leaks at industrial facilities, from pipelines transporting materials, from closed or capped sources such as oil wells, or from storage tanks. Volatile organic compounds (VOCs) are especially likely to be released through fugitive emissions.

The Air District currently implements three levels of regulatory control requirements that apply to fugitive VOC emissions: 1) local, e.g., Air District Regulation 8-18 – Equipment Leaks; 2) state, e.g., ARB's AB2588 program; and 3) federal requirements, e.g., USEPA's National Emission Standards for Hazardous Air Pollutants [NESHAPS], see 40 CFR Part 61 Subpart J - National Emission Standards for Equipment Leaks (Fugitive Emission Sources) of Benzene and 40 CFR Part 61 Subpart V -National Emission Standards for Equipment Leaks (Fugitive Emission Sources)). In particular, Regulation 8-18 prohibits a person from using any equipment that leaks total organic compounds in excess of levels prescribed per type of emissions source unless the leak has been discovered by the operator, minimized and repaired within the applicable time frames established in the regulation.

Fugitive emissions are not typically controlled by installing air pollution control devices. Instead, fugitive emissions are reduced through leak detection and repair requirements such as those in Regulation 8-18. It may be possible, if necessary, to provide additional fugitive emissions reductions by preparing an alternate emission reduction plan consistent with Regulation 8-18, Section 405 and that includes the following, if feasible: repair pumps, compressors and connectors when leaks are less than 100 ppm; repair PRDs when leaks are less than 500 ppm; enhanced or more frequent monitoring of fugitive emissions sources, etc. Preparing and submitting an alternate emission reduction plan to the Air District would provide an enforceable mechanism to ensure that further control of fugitive emissions is being conducted at affected facilities.

Petroleum refineries can have a large number and wide variety of fugitive emissions sources. Fugitive emissions are emissions of gases or vapors from pressurized equipment due to leaks and other unintended or irregular releases of gases during the crude refining process. Generally, any processes or transfer areas where leaks can occur are sources of fugitive VOC emissions. Fugitive emissions sources include, but are not limited to, valves, connectors (i.e., flanged, screwed, welded or other joined fittings), pumps, compressors, PRDs, storage tanks, etc. Because crude oil and other refinery streams contain a number of toxic contaminants including benzene, toluene, ethylbenzene, and xylene (BTEX), fugitive VOC emissions at refineries may contain these toxic compounds and, as such, pose a long term health risk to workers and local communities.

3.1.2.2 Applicable Emission Control Technologies

Table 3.1-1 above shows the most likely control technologies expected to be used. Each type of control technology is briefly described in the following paragraphs.

3.1.2.2.1 Wet Gas Scrubber (WGS)

Wet gas scrubbers are used to control both SO_2 and $PM_{2.5}$ emissions. There are two types of wet gas scrubbers: 1) caustic-based non-regenerative WGS; and, 2) regenerative WGS.

In a non-regenerative WGS, caustic soda (sodium hydroxide - NaOH) or other alkaline reagents, such as soda ash, are used as an alkaline absorbing reagent (absorbent) to capture SO_2 emissions. The absorbent captures SO_2 and sulfuric acid mist (H_2SO_4) and converts them to various types of sulfites and sulfates (e.g., $NaHSO_3$, Na_2SO_3, and Na_2SO_4). The absorbed sulfites and sulfates are later separated by a purge treatment system and the treated water, free of suspended solids, is either discharged or recycled.

A regenerative WGS removes SO_2 from the flue gas by using a buffer solution that can be regenerated. The buffer is then sent to a regenerative plant where the SO_2 is extracted as concentrated SO_2. The concentrated SO_2 is then sent to a sulfur recovery unit to recover the liquid SO_2, sulfuric acid, and elemental sulfur as a by-product. When the inlet SO_2 concentrations are high, a substantial amount of sulfur-based by-products can be recovered and later sold as a commodity for use in the fertilizer, chemical, pulp and paper industries. For this reason, the use of a regenerative WGS is favored over a non-regenerative WGS.

3.1.2.2.2 SOx Reducing Additives

To help reduce condensable particulate matter from sulfur, SOx reducing additives (catalysts) are used for reducing the production of SOx by-products in FCCUs. A SOx reducing catalyst is a metal oxide compound such as aluminum oxide (Al_2O_3), magnesium oxide (MgO), vanadium pentoxide (V_2O_5) or a combination of the three that is added to the FCCU catalyst as it circulates throughout the reactor. In the regenerator of the FCCU, sulfur bearing coke is burned and SO_2, CO, and CO_2 by-products are formed. A portion of SO_2 will react with excess oxygen and form SO_3, which will either stay in the flue gas or react with the metal oxide in the SOx reducing catalyst to form metal sulfate. In the FCCU reactor, the metal sulfate will react with hydrogen to form either metal sulfide and water, or more metal oxide. In the steam stripper section of the FCCU reactor, metal sulfide reacts with steam to form metal oxide and hydrogen sulfide. The net effect of these reactions is that the quantity of SO_2 in the regenerator is typically reduced between 40 to 65 percent while the quantity of H_2S in the reactor is increased. Generally, the increase in H_2S is handled by sulfur recovery processes located elsewhere within a refinery.

3.1.2.2.3 Flue Gas Treatment

According to a study prepared by ETS, Inc., and Nexidea (SCAQMD, 2010), using a flue gas scrubber is not cost-effective for refinery process heaters and boilers. The consultants concluded that for heaters and boilers, post-combustion emission control is often expensive due to the combination of the relatively low concentrations of SO_2 in flue gases and the division of the fuel gas stream among a number of heaters and boilers. Pre-combustion control, e.g., fuel gas treatment, has been found to be more suitable for the majority of situations to obtain SO_2

emission reductions from refinery process heaters and boilers. Therefore, the analysis of potential environmental impacts from the proposed project in Chapter 3 assumes that an affected refinery operator would likely rely on the fuel gas treatment control option in order to reduce SO_2 emissions from refinery process heaters and boilers instead of using a flue gas scrubber.

Refinery fuel gas, commonly used for operating refinery process heaters and boilers, is treated in various acid gas processing units such as an amine (Merox[2], for example) treating unit for removal of sour components such as H_2S, carbonyl sulfide (COS), mercaptan, and ammonia. Lean amine is generally used as an absorbent. At the end of the process, the lean amine is regenerated to form rich amine and H_2S is recovered in acid gas, which is then fed to the SRU/TGU for more processing. By improving the efficiency of the amine treating unit to recover more sulfur from the inlet acid gas stream, the sulfur content in the refinery fuel gas at the outlet and subsequently the SO_2 emissions from boilers and heaters that use these refinery fuel gases can be reduced. Selective Oxidation Catalyst EmeraChem Power LLC markets a proprietary catalytic gas treatment called selective oxidation catalyst "ESx" that is typically used as a sulfur reducing agent in conjunction with its "EMx NOx trap" catalyst to treat combustion exhaust gases from incinerators, process heaters, turbines and boilers. The ESx catalyst can also be used as part of SO_2 reduction for sulfur recovery units/tail gas treatment units. The ESx catalyst can reduce multiple sulfur species, including SO_2, SO_3, and H_2S from the tail gas stream while also removing CO, VOC, and PM2.5 emissions. ESx catalyst is a platinum group metal catalyst that stores sulfur species and simultaneously assists in the catalytic oxidation of CO and VOCs. The ESx units are typically outfitted with multiple chambers such that at least one chamber is always in regeneration while the other units are working to store SO_2. In the storage process, SO_2 is oxidized to SO_3 and is stored by EmeraChem's sorber. The catalyst regeneration process releases sulfur as SO_2.

3.1.2.2.4 Baghouses

A baghouse is an air filtration control device designed to remove particulate matter emissions from an exhaust gas stream using filter bags, cartridge-type filters, or envelope-type filters. A baghouse consists of the following components: filter medium and support, filter cleaning device, collection hopper, shell, and fan. In lieu of conventional natural or synthetic bag fabrics such as cotton or Nomex, polytetrafluoroethylene (PTFE, trade name Gore-Tex) fabric consists of a very thin laminate of microporous Teflon on a suitable substrate. PTFE bags are capable of a particulate collection efficiency of 99 to 99.9 percent for particle sizes down to 1.0 micron (μm) when properly operated and maintained. Because of the microporous nature of PTFE, air-to-cloth ratios for these applications are lower than with conventional fabrics, requiring more collector area for a given volume flow rate of gas at a higher relative pressure drop. PTFE can tolerate moderately high temperatures (400ºF) at the expense of shortened bag life. The current trend in bag cleaning is the pulsejet technology, where tubular bags are supported from the inside by metal wire frames. Gas flows across the fabric from the outside inward, exiting at the top of

[2] Merox is an acronym for mercapatan oxidation and the treatment process is a proprietary catalytic chemical process used for removing mercaptans from refinery fuel gas by converting them to liquid hydrocarbon disulfides. Merox treatment is an alkaline process that typically uses an aqueous solution of sodium hydroxide (NaOH) or caustic.

the bags. Periodically, a blast of compressed air from a fixed nozzle located inside the wire frame causes the bag to inflate outward, thus knocking the accumulated toxics-bearing dust off the bag exterior and into the baghouse hopper, ready for collection and disposal as dry potentially hazardous solid waste.

3.1.2.2.5 Cyclones

A cyclone, typically used as a pre-cleaner, does not have a blower mounted or connected to induce the particle-laden exhaust gas stream. Particles in the gas stream (both PM10 and PM2.5) enter the cyclone tangentially and centrifugal force, which moves the particulate against the cyclone's cone wall. Air flows in a helical pattern, beginning at the top (wide end) of the cyclone and ending at the bottom (narrow) end before exiting the cyclone in a straight stream through the center of the cyclone and out the top. Larger (denser) particles in the rotating stream have too much inertia to follow the tight curve of the stream, and strike the outside wall, then fall to the bottom of the cyclone where they can be removed and sent to a storage unit. In a conical system, as the rotating flow moves towards the narrow end of the cyclone, the rotational radius of the stream is reduced, thus separating smaller and smaller particles. The cyclone geometry, together with flow rate, defines the cut point of the cyclone. Cut point is the size of particle that will be removed from the stream with a 50 percent efficiency. Particles larger than the cut point will be removed out of the airstream with a greater efficiency and smaller particles with a lower efficiency. Greater centrifugal airflow improves particle separation and increases collection efficiency. Installing a cyclone is an attractive $PM_{2.5}$ control option because this technology is designed specifically for harsh, industrial environments and can operate in applications generating (both PM_{10} and $PM_{2.5}$) heavy particulate and high temperatures.

3.1.2.2.6 Electrostatic Precipitator (ESP)

An ESP is a control device designed to remove particulate matter (both PM_{10} and $PM_{2.5}$) from an exhaust gas stream. ESPs take advantage of the electrical principle that opposites attract. By imparting a high voltage charge to the particles, a high voltage direct current electrode negatively charges airborne particles in the exhaust stream, while simultaneously ionizing the carrier gas, producing an electrified field. The electric field in an ESP is the result of three contributing factors: the electrostatic component resulting from the application of a voltage in a dual electrode system, the component resulting from the space charge from the ions and free electrons, and the component resulting from the charged particulate. As the exhaust gas passes through this electrified field, the particles are charged. The strength or magnitude of the electric field is an indication of the effectiveness of an ESP. Typically 20,000 to 70,000 volts are used. The particles, either negatively or positively charged, are attracted to the ESP collecting electrode of the opposite charge.

There are two main types, dry ESPs and wet ESPs, and the decision of which type to use depends on the temperature of the exhaust gas stream when it enters the ESP, and the method used to remove particles from the collection electrodes. There are two significant advantages that most ESPs have over other control devices: 1) they have the capacity to handle large volumes of gas while minimizing the pressure drop across the unit; and 2) they generally have lower operating costs. The possible disadvantages of utilizing ESPs are potentially high capital costs and because of their size, large installation space (i.e., land) requirements. Dry ESPs can be designed to operate in for many different inlet stream conditions, temperatures and pressures. However, once a dry ESP is designed and installed, changes in operating conditions are likely to degrade overall performance. Wet ESPs have several advantages over dry ESPs in that they can absorb gases, cause some pollutants to condense (so that they are easier to collect), are easily integrated with other control equipment (i.e., scrubbers), eliminate the re-entrainment of captured particles, and are not limited by the resistivity of the particles.

3.1.2.2.7 Diesel Particulate Filters (DPFs)

To further reduce diesel particulate matter emissions from diesel internal combustion engines, which could be retrofitted with DPFs. Diesel particulate filters allow exhaust gases to pass through the filter medium, but trap diesel particulate matter before it is released to the atmosphere. Depending on an engine's baseline emissions and emission test method or duty cycle, DPFs can achieve diesel particulate matter emission reduction efficiencies from the exhaust of 70 to 90 percent. In addition, DPFs can reduce hydro carbon emissions by 95 percent and carbon monoxide emissions by 90 percent. Limited test data indicate that diesel particulate filters can also reduce NO_x emissions by six to ten percent.

Particulates build up in the traps over time and must be removed by burning because they are mainly carbon. Some designs use electrical resistance heaters to raise the temperature in the trap high enough to burn off the particulates. Others have a burner built into the trap. Currently, the most common regeneration scheme employs "post injection," in which a small amount of fuel is injected into the cylinder late in the expansion stroke. This fuel then burns in the exhaust system, raising the trap temperature to the point where the accumulated particulate matter is readily burned away.

There are both active DPFs and passive DPFs. Active DPFs use heat generated by means other than exhaust gases (e.g., electricity, fuel burners, and additional fuel injection to increase exhaust gas temperatures) to assist in the regeneration process. Passive DPFs, which do not require an external heat source to regenerate, incorporate a catalytic material, typically a platinum group metal, to assist in oxidizing trapped diesel PM.

3.1.2.2.8 Diesel Oxidation Catalysts (DOCs)

A DOC is a device that utilizes a chemical process in order to break down pollutants from a diesel engine in the exhaust stream, turning them into less harmful components, similar to an automobile's catalytic converter. DOCs typically consist of a monolith honeycomb substrate coated with platinum group metal catalyst, such as platinum, iridium, osmium, palladium, rhodium, and ruthenium, packaged in a stainless steel container. The honeycomb structure with many small parallel channels presents a high catalytic contact area to exhaust gasses. As the hot gases contact the catalyst, several exhaust pollutants are converted into carbon dioxide and water. DOCs have a control efficiency of approximately 30 percent. DOCs also reduce emissions of HC by 76 percent and CO by 46 percent. DOCs are also effective at reducing toxic air contaminant emissions, including polycyclic aromatic hydrocarbons (PAHs), which can be reportedly reduced by more than 80 percent. DOCs, however, increase sulfate PM emissions by oxidizing the sulfur in diesel fuel and lubricating oil, thus reducing overall catalyst effectiveness.

3.1.2.2.9 New Diesel Internal Combustion Equipment (ICEs)

Diesel ICEs are often used to provide electricity in certain areas of industrial facilities, used as a backup source of electricity in the event of a power outage, or as a means of pumping liquids between different equipment. Diesel ICEs are often referred to as compression ignition engines because the high temperature is the result of compressing air above the piston as it travels upward. The main advantage of using a diesel engine is its high thermal efficiency, however, diesel ICE exhaust tends to be high in NO_x and particulate emissions, both visible (smoke) and invisible. Diesel particulates were also classified as a TAC by ARB in in 1998. Other diesel exhaust pollutants may include unburned or partially burned hydrocarbons and carbon monoxide. Newer diesel ICEs are more efficient than older ICEs, thus, generate fewer emissions. By replacing older ICEs with newer ICEs refinery owner/operators may find additional sources in the event further emission reductions are needed to meet standards associated with the proposed project.

3.1.2.2.10 Thermal Oxidizers

Thermal oxidizers can be used to reduce emissions from all types of VOC sources including storing and loading/unloading materials that contain volatile organic liquids; vessel or tank cleaning; process vents; paint manufacturing; rubber products; surface coating operations, among others. Thermal oxidation or incineration is the process of oxidizing combustible materials by raising the temperature of the material above its auto-ignition point in the presence of oxygen, and maintaining it at high temperature for sufficient time to complete combustion to carbon dioxide and water. Time, temperature, turbulence (for mixing), and the availability of oxygen all affect the rate and efficiency of the combustion process. A thermal oxidizer uses a nozzle-stabilized flame maintained by a combination of auxiliary fuel, waste gas compounds, and supplemental air added when necessary. Upon passing through the flame, the waste gas is heated from its preheated inlet temperature to its ignition temperature. The ignition temperature varies for difference compounds and is the temperature at which the combustion reaction rate exceeds the rate of heat losses, thereby raising the temperature of the gases to some higher value. Any organic/air mixture will ignite it is temperature is raised to a sufficiently high level. The level of VOC control is based on the reactor temperature and the residence time that the waste gas spends in the reactor. Thermal oxidizers are one of the most positive proven methods for destroying VOC, with efficiencies up to 99.9999 percent (USEPA, 2016)

3.1.2.2.11 Carbon Adsorption

In carbon adsorption systems, gaseous pollutants are removed from an air stream by transferring the pollutants to the solid surface of an adsorbent. Activated carbon is the most commonly used adsorbent, although zeolites, polymers, and other adsorbents may be used. There is a limit to the mass of pollutants that can be collected by an adsorbent. When this limit is reached, the adsorbent is no longer effective in removing pollutant. To recover the ability to capture gaseous pollutants, adsorbents typically are "regenerated;" i.e., the pollutant is desorbed (removed) from the adsorbent. This regeneration may occur off-site or on-site.

The most common types of absorber systems use fixed beds (as opposed to fluidized beds, or the moving beds that are common in concentrator systems). One type regenerates on site; the second type, called a carbon drum, uses off-site regeneration. Carbon drum systems are low-capital-cost systems, used only when air flow rates and mass flow rates of pollutants are low. Regeneration, either on-site or off-site, typically uses either elevated temperatures (i.e., thermal desorption, sometimes using steam) or below-atmospheric pressures (vacuum regeneration

3.1.2.3 Proposed Stationary Source Regulatory Actions

The Air District is proposing a number of regulatory initiatives in the 2017 Plan that could require affected facilities to implement the types of control equipment outlined above. Additional wet gas scrubbers (6-8 sources), catalysts (1 source), flue gas treatment (unknown), baghouses (4), ESPs (4 sources), DPFs (7 sources) and DOCs (unknown) could be required at affected facilities to control both SO_2 and $PM_{2.5}$ emissions in response to control measures SS1 (Fluid Catalytic Cracking in Refineries); SS5 (Sulfur Recovery Units), SS6 (Refinery Fuel Gas), SS7 (Sulfuric Acid Plants), SS11 (Petroleum Refining Emissions Limits and Thresholds), SS19 (Portland Cement), SS20 (Air Toxics Risk Reduction from Existing Facilities), SS31 (General PM Emission Limits); and additional SCRs (10 sources) to control NOx in response control measures SS11 (Petroleum Refining Emissions Limits and Thresholds), SS22 (Stationary Gas Turbines); and additional thermal oxidizers and carbon absorption (4 sources) control technologies could be required to control ROG in response to control measures SS20 (Air Toxics Risk Reduction from Existing Facilities), and SS23 (Biogas Flares). There are other stationary source measures that do not include the control equipment listed above but may have potential adverse impacts, such as; SS26 (Surface Prep and Cleaning Solvent) due to possible reformulation of existing products; SS35 (PM from Coke Coal Storage & Handling) due to potential water use; SS36 (PM Trackout) due to potential water use; and WA1 (Landfills) due to potential use of internal combustion engines. The analyses in the subsequent sections of this chapter evaluate the potential for adverse impacts from installing and operating this equipment and the other non-equipment control strategies for each relevant environmental resource area.

In addition to requiring this control equipment, some of the Air District's proposed stationary source regulatory actions will enhance the monitoring, reporting, and data collection requirements in the Air District's rules; require increased frequency of repair; require the use of existing lower emission products; and enhance the enforceability of existing regulatory requirements. These regulatory actions do not require any new or modified equipment at any facility, and as such they are not expected to result in adverse physical environmental impacts. These type of stationary source regulatory actions include implementation of control measures SS2 (Equipment Leaks), SS3 (Cooling Towers), SS9 (Enhanced NSR Enforcement), SS10 (Petroleum Refining Emissions Tracking), SS14 (Methane from Capped Wells), SS15 (Natural Gas Processing and Distribution), SS24 (Sulfur Limits on Liquid Fuels); SS28 (LPG, Propane, Butane); SS29 (Asphaltic Concrete); SS30 (Residential Fan Type Furnaces); SS32 (Emergency

Back Up Generators); SS37 (PM from Asphaltic Operations); and SS39 (Enhanced Air Quality Monitoring). It should also be noted that two of these measures have already been adopted (SS2 and SS3), and the 2017 Plan calls for continued implementation of these efforts. As none of the measures discussed here would have any physical environment impacts, these measures are not addressed in the subsequent analyses in this chapter.

For a number of other proposed stationary source control measures, it is not clear at this point what type of regulatory action (if any) the Air District may take to implement them. For example, a number of control measures involve potential rules where further study is needed to determine whether it is in fact possible to obtain additional emission reductions, and if so, how. Such measures include SS4 (Refinery Flares), under which the Air District will evaluate areas of opportunity to further reduce emissions from flares at petroleum refineries; SS25 (Coatings, Solvents, Lubricants, Sealants, and Adhesives), under which the Air District will evaluate existing District limits on the amount of VOC in coatings, solvents, and adhesives to determine whether there are opportunities for additional emission reductions; and SS27 (Digital Printing Operations), under which the Air District will investigate how extensive digital printing operations are in the Bay Area and evaluate potential control technologies to limit emissions from such operations. Similarly, several measures involve potential rules that are still in the early planning stages, where the Air District is considering developing regulations but has not yet evaluated what regulatory limits may be appropriate and what affected facilities would be required to do to comply. Such measures include SS16 (Basin-Wide Methane Strategy), under which the Air District is considering adopting limit on methane emissions, but has not yet evaluated what the appropriate limit would be; SS18 (Basin-Wide Combustion Strategy), under which the Air District is considering adopting sector-specific GHG emissions limits for combustion sources, but has not yet evaluated what the appropriate limit may be for each sector to achieve technologically feasible and cost-effective reductions; SS38 (Fugitive Dust), under which the Air District is considering adopting limitations on particulate matter from construction sites and bulk material facilities, but has suspended work due to the prolonged drought affecting California and the need for water as the primary method of control; and SS40 (Odors), under which the District will review the effectiveness of existing odor thresholds and emissions limits in order to develop more stringent requirements, but has not yet identified what revised thresholds or limits may be appropriate. For all of these measures, it is not possible to project with any specificity exactly what types of regulatory revisions may result from the 2017 Plan, and what kinds of physical changes any such regulatory revisions may require at affected facilities.

In addition, for certain other control measures, it is not clear at this point exactly what facilities may be affected by any revised regulations or what the regulations will require them to do. For example, under control measures SS17 (GHG BACT Threshold), the Air District will consider lowering the emissions threshold at which it requires facilities to use the Best Available Control Technology to control GHG emissions when they install new equipment or make modifications to existing equipment. As this requirement only applies to facilities when they make such changes, it is not possible to predict which facilities will become subject to a lowered threshold and when, because it is not possible to forecast with any certainty when facilities will implement equipment upgrades that would trigger the requirement. In addition, the type of equipment that constitutes the Best Available Control Technology for a given emissions source depends on the type of source involved. Without knowing what types of equipment a facility may install or upgrade in the future, it is not possible to project what kinds of control technology might be required.

For these types of control measures, it is not possible to evaluate with any specificity whether there may be any significant environmental impacts arising from the Air District's implementation actions, as the implementation actions themselves and/or any resulting physical changes to the environment are not yet know with any specificity. In such situations, CEQA does not require an EIR to engage in speculation about what might or might not occur from such control measures. As CEQA Guidelines Section 15145 provides, "[i]f, after thorough investigation, a Lead Agency finds that a particular impact is too speculative for evaluation, the agency should note its conclusion and terminate discussion of the impact." Accordingly, speculative implementation actions of this type are not addressed in detail in the environmental analyses in this chapter. The Air District has projected what implementation of the 2017 Plan will involve as precisely as is reasonably possible at the current stage of regulatory development, and wherever there are specific implementation actions and specific physical changes to the environment that are likely or reasonably possible to occur, they and their environmental impacts are evaluated in detail. But where it is not possible at this stage to project the nature or extent of an implementation action or any resulting environmental impacts beyond mere speculation, they are not evaluated (and indeed cannot be evaluated) in the EIR in accordance with Guidelines Section 15145. In addition to the examples cited above, the following measures are also considered too speculative to determine if any environmental impacts might occur at this stage, these include: SS4 (Refinery Flares); SS12 (Petroleum Refining Climate Impacts Limits); SS16 (Basin-Wide Methane Strategy); SS17 (GHG BACT Threshold); SS18 (Basin-Wide Combustion Strategy); SS33 (Commercial Cooking Equipment); SS40 (Odors); and TR16 (Indirect Source Review).

This does not, of course, mean that there will be no further consideration of potential environmental impacts related to these control measures at additional points in the future. To the contrary, potential environmental impacts will continue to be addressed as the Air District moves forward with implementation the 2017 Plan. As that happens, it will become clear what specific regulatory revisions the District may propose and what they will require at affected facilities. When the specific regulatory revisions are proposed, they will need to be subjected to a CEQA environmental analysis before they can be adopted. At that point, the full details about the revised regulations – including what types of facilities will be covered, what they will be required to do in order to comply, and the potential environmental impacts will be – will be known and can be evaluated. Moreover, as it will be clear exactly what environmental impacts could occur, it will be possible to incorporate specific mitigation measures at that point as necessary to avoid or lessen any significant impacts. This additional CEQA process will ensure that potential impacts are fully addressed before any regulatory revisions are adopted. CEQA does not contemplate or require that such potential impacts be addressed at this Plan stage in situations where it is not possible to project (beyond speculation) how exactly the Plan may be implemented and what the nature or extent of any environmental impacts may be.

Finally, several of the control measures incorporate regulatory revisions that the Air District has already adopted. These control measures include SS1 (Fluid Catalytic Cracking), SS2 (Equipment Leaks), and SS3 (Cooling Towers), SS8 (Coke Calcining), SS10 (Petroleum Refining Emissions Tracking), and SS21 (New Source Review for Toxics). These measures are described in the 2017 Plan only for purposes of providing a comprehensive picture of how the Air District regulates stationary sources in the Bay Area. The Air District is not proposing to expand, add to, detract from, or otherwise revise these regulations in any way. As such, there are no Air District implementation actions that will result from the Air District's decision of whether or not to approve the 2017 Plan, and there are therefore no actions that could have any impact on the environment to be evaluated in the EIR. The potential for these prior regulatory actions to have significant environmental impacts was addressed (as appropriate) at the time they were adopted.

3.1.3 GRANTS AND INCENTIVES

In addition to the stationary source regulatory measures proposed in the 2017 Plan, the Air District is also proposing to use its grants and incentives programs to fund projects in furtherance of the Plan's goals of reducing air pollution and protecting public health and the global climate. The Plan's main vehicle for doing so is the Air District's Transportation Fund for Clean Air (TFCA), which funds cost-effective projects aimed at reducing on-road motor vehicle emissions in the Bay Area. The TFCA funds projects such as the following:

- shuttle bus and feeder bus services between transit hubs and commercial and employment centers;
- ridesharing and other trip reduction programs;
- bicycle projects such as bikeways and electronic bike lockers; and
- vehicle replacement projects that fund the replacement of older, higher-emitting vehicles with cleaner zero emission vehicles or partial zero emission vehicles.

In addition, the District's grant programs also include several additional programs, including:

- The Carl Moyer Program, which provides grants to upgrade or replace heavy-duty diesel vehicles and equipment such as school buses, agricultural equipment, marine vessels, and locomotives;
- The Mobile Source Incentive Fund (MSIF), which provides grants to public and private sector for projects eligible for the Carl Moyer Program, vehicle scrappage and agricultural assistance programs, and for projects to reduce pollution from school buses; and
- The Goods Movement Program, which provides grants to upgrade or replace diesel freight movement equipment such as trucks, locomotives, harbor craft, and cargo handling equipment.

The Air District is proposing to use the grants and incentive program to further the Plan's clean air goals under a number of control measures, primarily relating to transportation. These control measures call for using grant funding to target emissions reductions to be obtained from the transportation sector, either by promoting emissions-free alternatives to motor vehicle travel such as walking and bicycling, or by promoting less-polluting vehicular transportation such as public transit service or upgrading existing vehicles to cleaner vehicles. In control measure TR9 (Bicycle and Pedestrian Access and Facilities), for example, the Air District is proposing to continue its funding of bike lanes, routes, paths, and bicycle parking facilities. In control measure TR10 (Land Use Strategies), the District is proposing to continue to provide (and potentially increase) emission reduction incentive funding opportunities and vehicle trip reduction programs. And in control measure TR14 (Cars & Light Trucks), the District is proposing to commit regional clean air funds towards lower-emitting vehicle purchases and infrastructure development subsidies.

For these types of implementation actions, it is only possible to evaluate the Plan's potential environmental impacts in highly general terms. For example, TR9 – Bicycle Access and Pedestrian Facilities could lead toconstruction activity ranging from the striping of bicycle lanes on existing roads, to physical construction of new asphalt pavement for bicycles to travel on. However, as there are no specific projects at this point that have been proposed for grant funding based on the control measures in the 2017 Plan, it is not possible to evaluate whether there could be any environmental impacts from individual projects the Air District might fund, or the nature and extent of any such impacts. Given the unspecified nature of the particular activities that the Air District would fund through these measures, there is no way to evaluate at this point whether there could potentially be any significant environmental impacts associated with them.[3]

As noted above, CEQA Guidelines Section 15145 provides that "[i]f, after thorough investigation, a Lead Agency finds that a particular impact is too speculative for evaluation, the agency should note its conclusion and terminate discussion of the impact." That is the case here with respect to evaluating impacts from projects that the Air District may fund under the 2017 Plan. It is not possible at this stage to determine – beyond mere speculation – the nature, extent, location, or timing of any activities that may result from projects funded under the 2017 Plan, and therefore it is not possible to evaluate whether any such activities may generate a significant impact. In such situations, CEQA does not contemplate an attempt to assess the significance of purely speculative impacts in the EIR. Potential environmental impacts will be addressed as the Air District implements the 2017 Plan and it becomes clear what specific projects the District may support. When specific projects are proposed, they will need to be subjected to a CEQA

[3] There is one project referenced in the 2017 Plan that is specifically known and identified at this point, which is the Air District's support of the Caltrain peninsula corridor electrification project. The Air District committed to providing $20 million in grant funding to support this project in 2015. This committment has already been made, however, and the project is fully funded and under construction. This is not a grant that is contingent on adoption of the 2017 Plan, and the Air District is not proposing to expand or alter the funding commitment it made in 2015. The Caltrain peninsula corridor electrification project will therefore not be a direct or indirect effect of the District's adoption of the 2017 Plan, as the decision on whether or not to adopt the Plan will not affect the project in any way. As such, that project is not addressed in this EIR. (The potential environmental impacts of that project were fully evaluated under CEQA at the time it was approved, however.)

environmental analysis before they can be carried out on the ground. At that point, the specific details about the project, including what types of activity will be required and the potential environmental impacts, will be evaluated. The future CEQA analysis will be able to conduct a full analysis of any potential environmental impacts at that time, as the nature, extent, location, timing, and duration of the activity will be known.

For these reasons, the analysis in Chapter 3 does not evaluate potential impacts from any projects that the Air District may fund through its grants and incentives programs. Impacts from grants and incentive programs are addressed only to the extent that it is possible to address general, programmatic effects associated with the 2017 Plan as a whole. The control measures that fall into this category include: TR2 (Trip Reduction Programs); TR4 (Local and Regional Rail Service); TR7 (Safe Routes to Schools and Safe Routes to Transit); TR8 (Ridesharing, Last-Mile Connection); TR9 (Bicycle Access and Pedestrian Facilities); TR14 (Cars and Light Trucks); TR20 (Ocean Going Vessels); TR21 (Commercial Harbor Craft); and TR23 (Lawn and Garden Equipment); EN1 (Decarbonize Electricity Production); and BL3 (Market-Based Solutions).

3.1.4 TECHNICAL SUPPORT, EDUCATIONAL OUTREACH, AND ADVOCACY

The third category of actions the Air District is proposing in the 2017 Plan involves measures to promote sound policy development and healthy air quality choices throughout all sectors of our economy and society. These activities include promoting best practices by public agencies and other entities through informational resources, model ordinances, guidance documents, and the like; outreach and education to engage with community groups and other organizations; and advocacy in support of legislative and regulatory action at the federal and state levels in order to promote the District's air quality, public health, and climate protection goals.

The Air District's technical support, educational and advocacy efforts are aimed at supporting and encouraging other agencies, organizations, businesses and individuals as they take action to address air pollution and climate change concerns in areas outside of the Air District's direct regulatory authority, which focuses on emissions from stationary-source facilities. The District regularly participates with such entities to support them in developing plans, policies and programs that are aligned with the Air District's clean air and climate protection goals. For example, the Air District has partnered and participated in multiple collaborative policy and planning efforts, such as:

- *Plan Bay Area*, the regional transportation and land use plan recently adopted by the Metropolitan Transportation Commission (MTC) and the Association of Bay Area Governments (ABAG) pursuant to SB 375. *Plan Bay Area* is the Bay Area's Regional Transportation Plan and SB 375 Sustainable Communities Strategy, and it aims to reduce greenhouse gas emissions associated with the transportation sector by focusing new housing development in "Priority Development Areas" that are well-served by transit and are close to employment, shopping and other amenities;
- The California Air Resources Board's *2016 Mobile Source Strategy*, a comprehensive strategy to reduce emissions from mobile sources designed to inform multiple state planning efforts including California's Clean Air Act State Implementation plan, the Air

Resources Board's AB 32 Scoping Plan Update, the California Sustainable Freight Action Plan, and the Short-Lived Climate Pollutant Plan;

- MTC's regional *Goods Movement Plan*, MTC's long-range strategic plan for moving goods effectively within, to, from and through the Bay Area by roads, rail, air and water, including specific projects, programs and policies, designed to inform the upcoming long-range *Plan Bay Area 2040* (the next iteration of the current *Plan Bay Area* regional transportation plan and sustainable communities strategy referred to above); and
- The *Bay Area Goods Movement Collaborative*, an initiative convened by MTC and the Alameda County Transportation Commission to bring together partners, community members, and other stakeholders from across the region to understand goods movement needs and identify, prioritize, and advocate for short- and long-term strategies to address these needs.

The Air District's participation in collaborative multi-agency and multi-stakeholder efforts such as these provides technical expertise and a policy voice from the District's perspective as a stationary-source air pollution regulator, which can be a valuable resource in promoting clean air throughout the region. In addition, the Air District also provides educational resources to help ensure that the public at large is informed about air quality challenges and potential solutions, which helps build political support for clean air initiatives and empowers individual members of the public to contribute to clean air through their own lifestyle choices. The District also advocates before local, state and federal legislative and regulatory bodies to support further regulatory development in this area.

The Air District engages in a wide range of specific activities along these lines, and the proposed 2017 Plan calls for the District to continue and expand these efforts. For example, with respect to *Plan Bay Area* referred to above, Control Measure TR10 (Land Use Strategies) calls on the District to support MTC and ABAG, and local city and county governments, as they implement *Plan Bay Area*. The Air District's role in supporting these agencies takes a number of forms. The Air District provides informational resources such as web-based interactive mapping tools showing areas within the Bay Area with elevated levels of fine particulates and/or toxic air contaminants, which can be important in evaluating potential infill development areas. The District also identifies best practices to help local governments and developers reduce air pollutant emissions and exposures when they do propose infill development projects. It also provides technical support to assist local agencies in conducting their CEQA reviews to evaluate and mitigate any significant air quality or climate impacts that may be associated with such projects. The Air District provides this support through resources it has developed through its Community Air Risk Evaluation (CARE) program, its CEQA Guidelines document, and its *Planning Healthy Places* guidance document, among others. The 2017 Plan calls on the Air District to continue and enhance these efforts going forward.

Similarly, the Air District develops model ordinances and policies to facilitate the implementation of emission-reducing initiatives by local cities and counties. The proposed 2017 Plan includes commitments to further such efforts, such as in TR14 (Cars & Light Trucks), which calls for the District to develop model ordinances on electric vehicle charging in new home construction.

The Air District also focuses advocacy efforts on supporting legislative and regulatory initiatives to promote clean air and climate protection. The proposed 2017 Plan includes such efforts in measures like TR17 (Planes – Cleaner Aircraft Engines and Renewable Jet Fuel), which calls on the District to submit letters of support for legislative action to increase the use of cleaner-burning jet fuel and low-NOx engines in commercial jet aircraft; and TR14 (Cars & Light Trucks), discussed in the previous paragraph, which also calls on the District to support legislative approval for a regional “fee-bate” incentive program to encourage drivers to switch to cleaner vehicles.

Finally, the Air District also engages in education and outreach efforts aimed at encouraging members of the public to generally make positive lifestyle choices to help improve air quality. For example, the Air District’s “Spare the Air Every Day” Program encourages members of the public to reduce motor vehicle travel and other pollutant-emitting activities, especially on “Spare the Air” days when high ozone levels are predicted. The program includes an extensive advertising campaign through print media, billboards, and TV and website advertising; media outreach through news programs and community-based outreach channels such as newsletters; public outreach at community events such as county fairs; and Spare the Air alert notifications via media channels, alert notification sign-up lists, and an employer program through which employers encourage their workers to take advantage of alternative commuting options. In addition, the Air District operates a number of youth education programs designed to ensure that students at all levels are exposed to information about air quality challenges and how they can help address them, including:

- The Protect Your Climate Curriculum, which provides lessons for 4^{th} and 5^{th} grade students focusing on air pollution, energy, waste reduction and transportation;
- The Clean Air Challenge Curriculum, a science-based curriculum that includes experiments that help students understand air pollution and climate change;
- Cool the Earth, a greenhouse gas reduction program for kindergarten through 8^{th} grade students and their parents;
- As the World Warms, a classroom supplement with news stories and puzzles on climate change for elementary school students; and
- The eCO_2 Commute Challenge Project Manual, a tool to help high school students take action in their schools to reduce greenhouse gas emissions from student commutes by promoting walking, biking, public transportation and carpooling.

The proposed 2017 Plan incorporates education and outreach efforts such as these through control measures such as TR15 (Public Outreach), under which the Air District will continue to implement the Spare the Air Every Day Campaign and to implement its outreach and education efforts, including its Spare the Air Youth Program. The Plan also includes additional public outreach and education activities related to the benefits of telecommuting, ridesharing, smart driving techniques, safe school routes, bicycling, energy efficiency, and water conservation (control measures TR1 (Clean Air Teleworking Initiative), TR2 (Trip Reduction Programs), TR12 (Smart Driving), TR15 (Public Outreach & Education), EN2 (Decrease Electricity Demand), and WR2 (Support Water Conservation)).

These technical support, educational and advocacy efforts called for under the proposed 2017 Plan are not expected to result in any significant environmental impacts. Providing policy input by participating in the development of other agencies' plans and initiatives in those agencies' own regulatory areas, as the District has done with ARB's *Mobile Source Strategy* and MTC's regional *Goods Movement Plan*, does not involve any activities that could generate environmental impacts. Nor does providing technical support for implementing such plans and initiatives once they are adopted, for example by providing interactive mapping tools or identifying best practices to mitigate air quality impacts from infill development to assist in implementing *Plan Bay Area*. And the same is true for other educational outreach and advocacy efforts the Air District will engage in under the proposed 2017 Plan, such as developing model ordinances for use by city and county governments, advocating for legislative or regulatory action, and providing educational programs to promote informed lifestyle choices related to clean air.

Furthermore, to the extent that the Air District's technical support, educational and advocacy efforts are aimed at promoting sound policy choices by other governmental agencies and private actors, it is not possible to assess with any level of specificity how the District's efforts would result in specific actions by such third-party actors that would result in physical changes to the environment. The Air District obviously hopes that its efforts will help influence positive outcomes. But it is not possible to predict beyond speculation what actions any other agency or private actor may take or not take as a result of the District's efforts, compared to what would occur absent any District action. As a result, it is not possible to assess whether there would be any physical changes to the environment that might occur as a result of the District's efforts under the 2017 Plan, let alone the extent of any potential adverse impacts associated with any such changes. Accordingly, under CEQA Guidelines Section 15145, such attenuated and speculative impacts from the District's technical support, educational and advocacy efforts are not evaluated in the analyses in Chapter 3. These include: SS13 (Oil and Gas Production); TR1 (Clean Air Teleworking Initiative); TR10 (Land Use Strategies); TR11 (Value Pricing); TR12 (Smart Driving); TR13 (Parking Policies); TR14 (Cars and Light Trucks); TR15 (Public Outreach and Education); TR17 (Planes); TR20 (Ocean Going Vessels); EN2 (Decrease Electricity Demand); AG3 (Enteric Fermentation); NW1 (Carbon Sequestering in Rangelands); NW2 (Urban Tree Planting); and WA3 (Green Waste Diversion). BL1 (Green Buildings); BL2 (Decarbonize Buildings); BL4 (Urban Heat Islands); AG1 (Agriculture Guidance and Leadership); AG2 (Diary Digesters); NW3 (Carbon Sequestration in Wetlands); WA4 (Recycling and Waste Reduction); WR1 (Limit GHGs from POTWs); WR2 (Support Water Conservation); SL1 (Short-Lived Climate Pollutants); and SL2 (Guidance for Local Planners).

3.1.5 ACTIONS BY OTHER AGENCIES

Finally, to be comprehensive, the 2017 Plan also includes several control measures that will be implemented primarily or exclusively by the Air District's partner agencies such as the Metropolitan Transportation Commission (MTC) and the Association of Bay Area Governments (ABAG). These measures include MTC and ABAG actions and activities related to implementing *Plan Bay Area*, the Regional Transportation Plan and SB 375 Sustainable

Communities Strategy adopted by MTC and ABAG referred to above, along with other types of activities. Control measures that will primarily or exclusively be implemented by other agencies include: TR1 (Clean Air Teleworking Initiative); TR2 (Trip Reduction Programs); TR3 (Local and Regional Bus Service); TR4 (Local and Regional Rail Service); TR5 (Transit Efficiency and Use); TR6 (Freeway and Arterial Operations); TR7 (Safe Routes to Schools and Safe Routes to Transit); TR8 (Ridesharing, Last-Mile Connection); TR9 (Bicycle Access and Pedestrian Facilities); TR10 (Land Use Strategies); TR11 (Value Pricing); TR12 (Smart Driving); TR13 (Parking Policies); TR15 (Public Outreach and Education); and TR18 (Goods Movement).

The 2017 Plan includes these control measures because they involve activities by other regional agencies that further the same clean air and climate protection goals that the Air District is seeking to achieve under the 2017 Plan. Including them in the Plan serves to provide a comprehensive picture of activities throughout the region. These activities by other agencies are included for informational purposes only, however. They are not dependent on approval of the 2017 Plan, and the Air District's approval of the 2017 Plan will not authorize or commit those agencies to any action. As these actions and activities by independent agencies are not Air District actions and will occur independently of the District's approval of the 2017 Plan, they are not direct or indirect effects resulting from approval of the Plan that must be analyzed in the EIR. Accordingly, Chapter 3 does not address implementation actions by other agencies independent of the Air District's implementation actions under the 2017 Plan.[4]

[4] Actions that the Air District will take in conjunction with other agencies to support their implementation actions, such as providing technical advice and policy input, are addressed above in Section 3.1.4.

CHAPTER 3.2 AIR QUALITY

3.2 AIR QUALITY

3.2.1 INTRODUCTION

This subchapter of the EIR evaluates the 2017 Plan, including the 85 associated control measures, to determine whether the Plan would result in any significant air quality impacts. The 2017 Plan is designed to reduce emissions from existing emission sources and promote the lowest achievable emission rates from new emission sources. The proposed control measures would affect existing commercial/industrial facilities; increase energy efficiency; establish specifications for coatings, fuels and mobile source exhaust emissions; minimize vehicle trips; accelerate the replacement of high emitting mobile sources with zero or near-zero emissions sources; establish greater control of industrial stationary sources; establish greater control of fugitive emissions; improve monitoring; and establish education and outreach programs. All of these measures are designed to reduce emissions throughout the San Francisco Bay Area in order to improve air quality and public health and or/to protect the climate.

As discussed in the Initial Study, some of these control measures could have ancillary adverse impacts that could result in increased emissions of air pollutants, which would offset the emission reductions resulting from the Plan. For example, implementation of some of the control measures could involve retrofitting, replacing, or installing new air pollution control equipment, changes in product formulations, or construction of transportation infrastructure that have the potential to create air quality impacts. Emissions from one pollutant may increase slightly in order to effectively reduce overall emissions. This subchapter identifies and quantifies direct air quality effects anticipated to occur as a result of implementing the various control measures and the indirect or secondary air quality impacts that could occur as a consequence of efforts to improve air quality (e.g., emissions from control equipment such as afterburners).

The air quality impact analysis in the Program EIR identifies the net effect on air quality from implementing the 2017 Plan. The Initial Study (see Appendix A) determined that the air quality impacts of the proposed project are potentially significant. Therefore, this Program EIR evaluates whether any potential ancillary increase in emissions would offset the emission reductions anticipated from implementation of the 2017 Plan, such that there could be a significant adverse air quality impact. This analysis includes the potential for significant cumulative regional and local air quality impacts, either through net increases in emissions region-wide or through local increases in emissions that would result in significant localized impacts. The EIR also evaluates the potential for the Plan to cause or contribute to violations of any applicable air quality standards or to expose sensitive receptors to substantial concentration of TACs or other pollutants that could cause a significant health risk.

3.2.2 ENVIRONMENTAL SETTING

3.2.2.1 Criteria Air Pollutants

3.2.2.1.1 Ambient Air Quality Standards and Health Effects

It is the responsibility of the Air District to ensure that State and federal ambient air quality standards are achieved and maintained in its geographical jurisdiction. Health-based air quality standards have been established by California and the federal government for the following criteria air pollutants: ozone, CO, nitrogen dioxide (NO_2), particulate matter (PM10 and PM2.5), sulfur dioxide (SO_2), and lead. These standards were established to protect sensitive receptors with a margin of safety from adverse health impacts due to exposure to air pollution. The State AAQS are more stringent than the federal standards, and in the case of PM10 and SO_2 far more stringent. California has also established standards for sulfate, visibility, hydrogen sulfide, and vinyl chloride. The State and National AAQS for each of these pollutants and their effects on health are summarized in Table 3.2-1.

U.S. EPA requires CARB and the Air District to measure the ambient levels of air pollution to determine compliance with the national AAQS. To comply with this mandate, the Air District monitors levels of various air pollutants at 34 monitoring stations within the San Francisco Bay Area. A summary of the 2015 maximum concentration and number of days exceeding State and federal ambient air standards at the Air District criteria pollutant monitoring stations are presented in Table 3.2-2.

Air quality conditions in the San Francisco Bay Area have improved since the Air District was created in 1955. Ambient concentrations of air pollutants and the number of days on which the region exceeds air quality standards have been reduced, although increases in the number of days that the standards has been exceeded increase in 2014-and 2015 (see Table 3.2-3). The Air District is in attainment of the State and federal ambient air quality standards for CO, nitrogen oxides (NOx), and sulfur oxides (SOx). The Air District is unclassified for the federal 24-hour PM10 standard. Unclassified means that the monitoring data were incomplete and at the time of designations did not support a designation of attainment or non-attainment. However, the Air District does not comply with the State 24-hour PM10 standard.

The 2015 air quality data from the Air District monitoring stations are presented in Table 3.2-2. All monitoring stations recorded concentrations that were below the State standard and federal ambient air quality standards for CO and SO_2. The Bay Area is designated as a non-attainment area for the federal and state 8-hour ozone standard. The State 8-hour standard was exceeded on 12 days in 2015 in the Air District; most frequently in the Eastern District (Livermore, Patterson Pass, and San Ramon) (see Table 3.2-2). The federal 8-hour standard was exceeded on 12 days in 2015.

TABLE 3.2-1
Federal and State Ambient Air Quality Standards

	STATE STANDARD	FEDERAL PRIMARY STANDARD	MOST RELEVANT EFFECTS
AIR POLLUTANT	CONCENTRATION/ AVERAGING TIME	CONCENTRATION/ AVERAGING TIME	
Ozone	0.09 ppm, 1-hr. avg. > 0.070 ppm, 8-hr	No Federal 1-hr standard 0.070 ppm, 8-hr avg. >	(a) Short-term exposures: (1) Pulmonary function decrements and localized lung edema in humans and animals (2) Risk to public health implied by alterations in pulmonary morphology and host defense in animals; (b) Long-term exposures: Risk to public health implied by altered connective tissue metabolism and altered pulmonary morphology in animals after long-term exposures and pulmonary function decrements in chronically exposed humans; (c) Vegetation damage; (d) Property damage
Carbon Monoxide	9.0 ppm, 8-hr avg. > 20 ppm, 1-hr avg. >	9 ppm, 8-hr avg.> 35 ppm, 1-hr avg.>	(a) Aggravation of angina pectoris and other aspects of coronary heart disease; (b) Decreased exercise tolerance in persons with peripheral vascular disease and lung disease; (c) Impairment of central nervous system functions; (d) Possible increased risk to fetuses
Nitrogen Dioxide	0.03 ppm, annual avg. 0.18 ppm, 1-hr avg. >	0.053 ppm, ann. avg.> 0.100 ppm, 1-hr avg.	(a) Potential to aggravate chronic respiratory disease and respiratory symptoms in sensitive groups; (b) Risk to public health implied by pulmonary and extra-pulmonary biochemical and cellular changes and pulmonary structural changes; (c) Contribution to atmospheric discoloration
Sulfur Dioxide	0.04 ppm, 24-hr avg.> 0.25 ppm, 1-hr. avg. >	No Federal 24-hr Standard> 0.075 ppm, 1-hr avg.>	(a) Bronchoconstriction accompanied by symptoms which may include wheezing, shortness of breath and chest tightness, during exercise or physical activity in persons with asthma
Suspended Particulate Matter (PM10)	20 $\mu g/m^3$, ann. arithmetic mean > 50 $\mu g/m^3$, 24-hr average>	No Federal annual Standard 150 $\mu g/m^3$, 24-hr avg.>	(a) Excess deaths from short-term exposures and exacerbation of symptoms in sensitive patients with respiratory disease; (b) Excess seasonal declines in pulmonary function, especially in children
Suspended Particulate Matter (PM2.5)	12 $\mu g/m^3$, annual arithmetic mean> No State 24-hr Standard	12 $\mu g/m^3$, annual arithmetic mean> 35 $\mu g/m^3$, 24-hour average>	Decreased lung function from exposures and exacerbation of symptoms in sensitive patients with respiratory disease; elderly; children.
Sulfates	25 $\mu g/m^3$, 24-hr avg. >=	No Federal Standard	(a) Decrease in ventilatory function; (b) Aggravation of asthmatic symptoms; (c) Aggravation of cardio-pulmonary disease; (d) Vegetation damage; (e) Degradation of visibility; (f) Property damage
Lead	1.5 $\mu g/m^3$, 30-day avg. >= No State Calendar Quarter Standard No State 3-Month Rolling Avg. Standard	No Federal 30-day avg. Standard 1.5 $\mu g/m^3$, calendar quarter> 0.15 $\mu g/m^3$ 3-Month Rolling average	(a) Increased body burden; (b) Impairment of blood formation and nerve conduction
Visibility-Reducing Particles	In sufficient amount to give an extinction coefficient >0.23 inverse kilometers (visual range to less than 10 miles) with relative humidity less than 70%, 8-hour average (10am – 6pm PST)	No Federal Standard	Visibility based standard, not a health based standard. Nephelometry and AISI Tape Sampler; instrumental measurement on days when relative humidity is less than 70 percent

TABLE 3.2-2
Bay Area Air Pollution Summary 2015

MONITORING STATIONS	Ozone						CARBON MONOXIDE			NITROGEN DIOXIDE			SULFUR DIOXIDE			PM10				PM2.5				
	Max 1-Hr	Cal 1-Hr Days	Max 8-Hr	Nat. 8-Hr Days	Cal Days	3-Yr Avg	Max 1-Hr	Max 8-Hr	Nat/Cal Days	Max 1-Hr	Ann Avg	Nat/Cal Days	Nat/ Cal Days	Max 1-Hr	Max 24-Hr	Nat 24-Hr	Cal 24-Hr	Ann Avg	Max 24-hr	Max 24-Hr	Nat 24-Hr Days	3-Yr Avg	Ann Avg	3-Yr Avg
NORTH COUNTIES	(ppb)		(ppb)				(ppm)			(ppb)			(ppb)			(µg/m³)				(µg/m³)			(µg/m³)	
Napa	79	0	69	0	0	61	3.3	1.6	0	43	8	0	-	-	-	0	0	18.6	50	38.2	1	27	10.6	11.4
San Rafael	81	0	70	0	0	61	1.4	0.9	0	44	11	0	-	-	-	0	0	16.1	42	36.3	2	26	8.6	10.0
Sebastopol*	68	0	62	0	0	*	1.3	0.9	0	37	5	0	-	-	-	-	-	-	-	29.9	0	*	6.8	*
Vallejo	85	0	70	0	1	61	2.4	1.9	0	44	8	0	0	5	1.7	-	-	-	-	41.4	3	29	9.6	9.8
COAST & CENTRAL BAY																								
Laney College Freeway*	-	-	-	-	-	-	2.7	1.6	0	106	18	1	-	-	-	-	-	-	-	37.2	1	*	10.0	*
Oakland	94	0	74	2	2	52	2.4	1.4	0	48	11	0	-	-	-	-	-	-	-	44.7	1	25	8.3	9.1
Oakland-West	91	0	64	0	0	49	4.7	2.6	0	57	14	0	0	21.6	3.9	-	-	-	-	38.7	3	29	10.2	10.8
Richmond	-	-	-	-	-	-	-	-	-	-	-	-	0	12	2.8	-	-	-	-	-	-	-	-	-
San Francisco	85	0	67	0	0	48	1.8	1.3	0	71	12	0	-	-	-	0	0	19.2	47	35.4	0	25	7.6	8.4
San Pablo	84	0	62	0	0	55	2	1.1	0	46	9	0	0	10.7	2.4	0	0	18.6	43	33.2	0	27	8.9	10.5
EASTERN DISTRICT																								
Bethel Island	80	0	72	1	2	66	1.1	0.9	0	29	5	0	0	8.8	1.9	0	0	13.6	33	-	-	-	-	-
Concord	88	0	73	2	4	64	1.4	1.3	0	33	7	0	0	6.7	2	0	0	13.1	24	31	0	23	8.8	7.7
Crockett	-	-	-	-	-	-	-	-	-	-	-	-	0	20.5	3.7	-	-	-	-	-	-	-	-	-
Fairfield	84	0	72	1	1	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Livermore	105	1	81	7	7	73	-	-	-	50	10	0	-	-	-	-	-	-	-	31.1	0	28	8.8	8.2
Martinez	-	-	-	-	-	-	-	-	-	-	-	-	0	14.7	4.8	-	-	-	-	-	-	-	-	-
Patterson Pass*	99	4	82	5	6	*	-	-	-	19	3	0	-	-	-	-	-	-	-	-	-	-	-	-
San Ramon	106	1	84	6	6	70	-	-	-	37	6	0	-	-	-	-	-	-	-	-	-	-	-	-
SOUTH CENTRAL BAY																								
Hayward	103	2	84	2	2	65	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Redwood City	86	0	71	1	1	59	3.4	1.6	0	48	11	0	-	-	-	-	-	-	-	34.6	0	24	5.7	7.8
SANTA CLARA VALLEY																								
Gilroy	95	1	78	3	3	67	-	-	-	-	-	-	-	-	-	-	-	-	-	42.2	2	18	7.2	7.5
Los Gatos	100	1	84	4	5	67	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
San Jose	94	0	81	2	2	63	2.4	1.8	0	49	13	0	0	3.1	1.1	0	1	22	58	49.4	2	30	10.0	10.2
San Jose Freeway*	-	-	-	-	-	-	2.7	2	0	61	18	0	-	-	-	-	-	-	-	46.9	1	*	8.4	*
San Martin	98	1	83	4	4	70	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-
Total Bay Area Days over Standard		**7**		**12**	**12**				**0**		**1**	**0**	**0**			**0**	**1**				**9**			

*Air monitoring at Sebastopol began in January 2014. Therefore, 3-year average statistics for ozone and PM2.5 are not available. The Sebastopol site replaced the Santa Rosa site which closed on December 13, 2013.
Ozone monitoring using the federally accepted method began at Patterson Pass on April 1, 2015. Therefore, 3-year average ozone statistics are not available.
Near-road air monitoring at Laney College Freeway began in February 2014. Therefore, 3-year average PM2.5 statistics are not available.
Near-road air monitoring at San Jose Freeway began in September 2014. Therefore, 3-year average PM2.5 statistics are not available.
(ppb) = parts per billion (ppm) = parts per million, ($\mu g/m^3$) = micrograms per cubic meter
*

TABLE 3.2-3
Ten-Year Bay Area Air Quality Summary
(days over current standard)

Year	Ozone			Carbon Monoxide				Nitrogen Dioxide		Sulfur Dioxide		PM10		PM2.5
	8-Hr	1-Hr	8-Hr	1-Hr		8-Hr		1-Hr				24-Hr		24-Hr
	Nat.	Cal.	Cal.	Nat.	Cal.	Nat.	Cal.	Nat.	Cal.	1-Hr Nat.	24-Hr Cal.	Nat.	Cal.	Nat.
2006	20	18	22	0	0	0	0	1	0	0	0	0	15	10
2007	8	4	9	0	0	0	0	0	0	0	0	0	4	14
2008	19	9	20	0	0	0	0	0	0	2	0	0	5	12
2009	11	11	13	0	0	0	0	0	0	0	0	0	1	11
2010	11	8	11	0	0	0	0	0	0	0	0	0	2	6
2011	9	5	10	0	0	0	0	0	0	0	0	0	3	8
2012	8	3	8	0	0	0	0	1	0	0	0	0	2	3
2013	3	3	3	0	0	0	0	0	0	0	0	0	6	13
2014	9	3	10	0	0	0	0	0	0	0	0	0	2	3
2015	12	7	12	0	0	0	0	1	0	0	0	0	1	9

All monitoring stations were in compliance with the federal PM10 standards. The California PM10 standard was exceeded on one day in 2015. The Air District exceeded the federal PM2.5 standard on nine days in 2015 (see Table 3.2-3).

Criteria Pollutants Health Effects

The 2017 Plan is aimed at reducing emissions of ozone, particulate matter (PM10 and PM2.5), toxic air contaminants and GHG emissions. The health effects associated with criteria pollutants, including ozone, ozone precursors, and particulate matter are addressed in this section.

Ozone: Ozone is not emitted directly from pollution sources. Instead ozone is formed in the atmosphere through complex chemical reactions between hydrocarbons, or reactive organic gases (ROG, also commonly referred to as volatile organic compounds or VOC), and nitrogen oxides (NOx), in the presence of sunlight. ROG and NOx are referred to as ozone precursors.

Ozone, a colorless gas with a sharp odor, is a highly reactive form of oxygen. High ozone concentrations exist naturally in the stratosphere. Some mixing of stratospheric ozone downward through the troposphere to the earth's surface does occur; however, the extent of ozone mixing is limited. At the earth's surface in sites remote from urban areas ozone concentrations are normally very low (0.03-0.05 ppm). While ozone is beneficial in the stratosphere because it filters out skin-cancer-causing ultraviolet radiation, ground level ozone is harmful, is a highly reactive oxidant, which accounts for its damaging effects on human health, plants and materials at the earth's surface.

Ozone is harmful to public health at high concentrations near ground level. Ozone can damage the tissues of the lungs and respiratory tract. High concentrations of ozone irritate the nose, throat, and respiratory system and constrict the airways. Ozone also can aggravate other respiratory conditions such as asthma, bronchitis, and emphysema, causing increased hospital admissions. Repeated exposure to high ozone levels can make people more susceptible to respiratory infection and lung inflammation and permanently damage lung tissue. Ozone can also have negative cardiovascular impacts, including chronic hardening of the arteries and acute triggering of heart attacks. Children are most at risk as they tend to be active and outdoors in the summer when ozone levels are highest. Seniors and people with respiratory illnesses are also especially sensitive to ozone’s effects. Even healthy adults can be affected by working or exercising outdoors during high ozone levels.

The propensity of ozone for reacting with organic materials causes it to be damaging to living cells, and ambient ozone concentrations in the Bay Area are occasionally sufficient to cause health effects. Ozone enters the human body primarily through the respiratory tract and causes respiratory irritation and discomfort, makes breathing more difficult during exercise, reducing the respiratory system's ability to remove inhaled particles and fight infection while long-term exposure damages lung tissue. People with respiratory diseases, children, the elderly, and people who exercise heavily are more susceptible to the effects of ozone.

Plants are sensitive to ozone at concentrations well below the health-based standards and ozone is responsible for significant crop damage. Ozone is also responsible for damage to forests and other ecosystems.

Particulate Matter (PM10 and PM2.5): Particulate matter, or PM consists of microscopically small solid particles or liquid droplets suspended in the air. PM can be emitted directly into the air or it can be formed from secondary reactions involving gaseous pollutants that combine in the atmosphere. Particulate pollution is primarily a problem in winter, accumulating when cold, stagnant weather comes into the Bay Area. PM is usually broken down further into two size distributions, PM10 and PM2.5. Of great concern to public health are the particles small enough to be inhaled into the deepest parts of the lung. Respirable particles (particulate matter less than about 10 micrometers in diameter) can accumulate in the respiratory system and aggravate health problems such as asthma, bronchitis and other lung diseases. Children, the elderly, exercising adults, and those suffering from asthma are especially vulnerable to adverse health effects of PM10 and PM2.5.

A consistent correlation between elevated ambient fine particulate matter (PM10 and PM2.5) levels and an increase in mortality rates, respiratory infections, number and severity of asthma attacks and the number of hospital admissions has been observed in different parts of the United States and various areas around the world. Studies have reported an association between long-term exposure to air pollution dominated by fine particles (PM2.5) and increased mortality, reduction in life-span, and an increased mortality from lung cancer.

Daily fluctuations in fine particulate matter concentration levels have also been related to hospital admissions for acute respiratory conditions, to school and kindergarten absences, to a decrease in respiratory function in normal children and to increased medication use in children and adults with asthma. Studies have also shown lung function growth in children is reduced with long-term exposure to particulate matter. The elderly, people with pre-existing respiratory and/or cardiovascular disease and children appear to be more susceptible to the effects of PM10 and PM2.5.

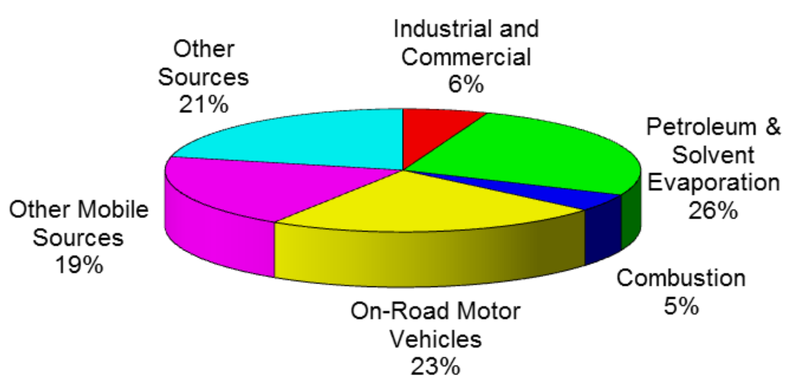
3.2.2.1.2 Current Emissions Inventory

An emission inventory is a detailed estimate of air pollutant emissions from a range of sources in a given area, for a specified time period. Future projected emissions incorporate current levels of control on sources, growth in activity in the Air District and implementation of future programs that affect emissions of air pollutants.

Ozone

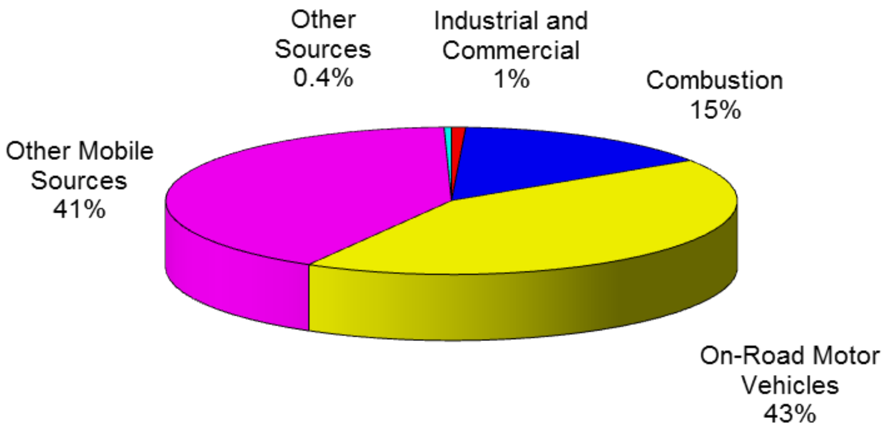
NOx and VOC emissions are decreasing state-wide and in the San Francisco Bay Area since 1975 and are projected to continue to decline. VOC emissions result primarily from incomplete fuel combustion and the evaporation of paints, solvents and fuels. Mobile sources are the largest contributors to VOC emissions. Stationary sources include processes that use solvents (such as manufacturing, degreasing, and coating operations) and petroleum refining, and marketing. Area-wide VOC sources include consumer products, pesticides, aerosol and architectural coatings, asphalt paving and roofing, and other evaporative emissions. The inventory of anthropogenic ROG emissions in the Bay Area is provided in Figure 3.2-1.

FIGURE 3.2-1. Anthropogenic ROG Emissions by Source, 2015 (259 tons/day)



Most NOx emissions are produced by the combustion of fuels. Mobile sources of NOx include motor vehicles, aircraft, trains, ships, recreation boats, industrial and construction equipment, farm equipment, off-road recreational vehicles, and other equipment. Stationary sources of NOx include both internal and external combustion processes in industries such as manufacturing, food processing, electric utilities, and petroleum refining. Area-wide sources, which include residential fuel combustion, waste burning, and fires, contribute only a small portion to the total NOx emissions. NO_2 is a component of NOx, and its presence in the atmosphere can be correlated with combustion emissions. The inventory of anthropogenic NOx emissions in the Bay Area is provided in Figure 3.2-2

FIGURE 3.2-2. Anthropogenic NOx Emissions by Source, 2015 (298 tons/day)



NOx and VOC emissions have been reduced for both stationary and mobile sources. Stationary source emissions of VOC and NOx have been substantially reduced due to stringent District regulations. Mobile source emissions of VOC and NOx have been substantially reduced because of stricter State and federal standards, despite an increase in vehicle miles traveled in the Bay Area.

There are literally millions of sources of ozone precursors in the Bay Area, including industrial and commercial facilities, motor vehicles, and consumer products such as household cleaners and paints. Even trees and plants produce ozone precursors. Sources of ozone precursors produced by human activity are called anthropogenic sources while natural sources, produced by plants and animals, are called biogenic sources. In the Bay Area, emissions from anthropogenic sources are much higher than from biogenic sources.

Particulate Matter

Particulate matter (both PM10 and PM2.5) is a diverse mixture of suspended particles and liquid droplets (aerosols). PM includes elements such as carbon and metals; compounds such as nitrates, organics, and sulfates; and complex mixtures such as diesel exhaust, wood smoke, and soil. Unlike the other criteria pollutants which are individual chemical compounds, PM includes all particles that are suspended in the air. PM is both directly emitted (referred to as direct PM or primary PM) and also formed in the atmosphere through reactions among different pollutants (this is referred to as indirect or secondary PM).

PM is generally characterized on the basis of particle size. Ultra-fine PM includes particles less than one micron in diameter. Fine PM ($PM_{2.5}$) consists of particles 2.5 microns or less in diameter. PM_{10} consists of particles 10 microns or less in diameter. Total suspended particulates (TSP) includes suspended particles of any size.

Combustion of fossil fuels and biomass, primarily wood, from various sources are the primary contributors of directly-emitted Bay Area $PM_{2.5}$ in all seasons, as shown in Figure 3.2-3. Biomass combustion concentrations are about 3-4 times higher in winter than during the other seasons, and its contribution to peak $PM_{2.5}$ is greater, as confirmed by isotopic carbon (C^{14}) analysis. The increased winter biomass combustion sources reflect increased residential wood-burning during the winter season. Therefore, the Air District adopted, and continues to strengthen, its winter "Spare the Air" wood smoke control program, as briefly described in Chapter 4, to protect public health and avoid exceedances of PM standards.

FIGURE 3.2-3: Direct $PM_{2.5}$ Emissions by Source, Annual Average, 2015 (47 tons/day)

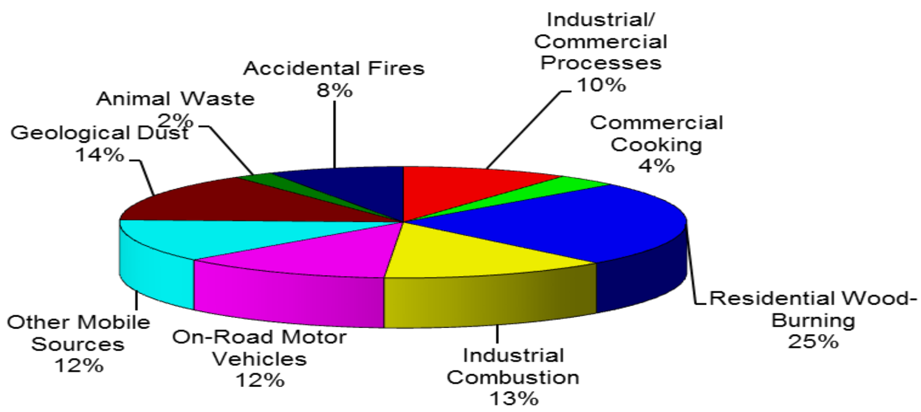


FIGURE 3.2-4: Directly Emitted PM10 Emissions by Source, Annual Average, 2015 (109 tons/day)

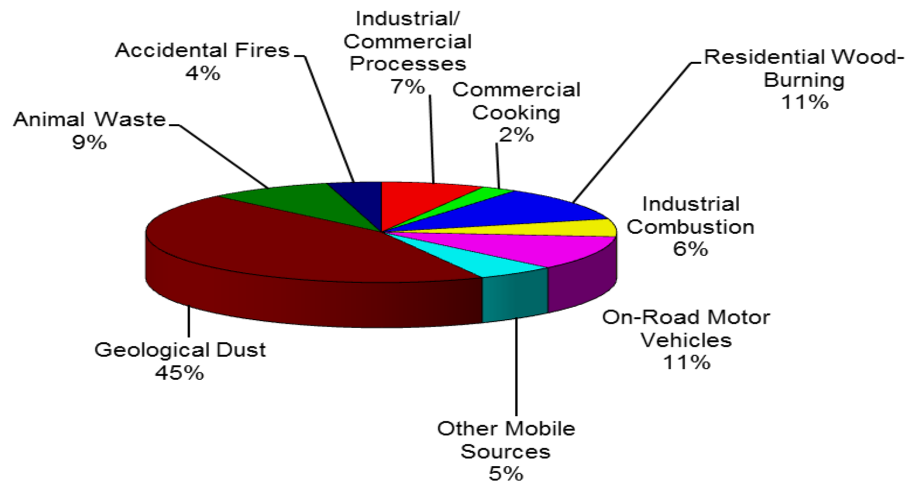


TABLE 3.2-4
2011 Air Emission Inventory – Annual Average
(tons per day)

SOURCE CATEGORY	ROG	CO	NOx	SO2	PM10	PM2.5
Petroleum Refining Processes	4.2	1.8	0.5	0.8	0.3	0.2
Other Industrial/Commercial Processes	9.8	0.9	1.7	6.9	10	6
Organic Compounds Evaporation	67.1	0	0	0	0	0
Combustion – Stationary Sources	11	113.8	48.3	10.2	17.9	17.3
Off-Road Mobile Sources	45.2	394.1	75.7	1.3	5.1	5.1
Aircraft	4.1	27.1	12.3	1.1	0.3	0.2
On-Road Motor Vehicles	80.8	773.9	176.6	0.9	13.2	7.2
Miscellaneous	51.2	15	0.5	0.1	58.5	9.5
Total Emissions	**273.4**	**1326.6**	**315.6**	**21.3**	**105.3**	**45.5**

Source: Bay Area Emission Inventory Summary Report: Criteria Air Pollutants (BAAQMD, 2014)

<u>Stationary Sources</u>

Stationary sources can be further divided between point and area sources.

Point Sources: Point sources are those that are identified on an individual facility or source basis, such as refineries and manufacturing plants. The Air District maintains a computer data bank with detailed information on operations and emissions characteristics for nearly 4,000 facilities, with roughly 20,000 different sources, throughout the Bay Area. Parameters that affect the quantities of emissions are updated regularly.

Area Sources: Area sources are stationary sources that are individually very small, but that collectively make a large contribution to the inventory. Many area sources do not require permits from the Air District, such as residential heating, and the wide range of consumer products such as paints, solvents, and cleaners. Some facilities considered to be area sources do require permits from the Air District, such as gas stations and dry cleaners. Emissions estimates for area sources may be based on the Air District data bank, calculated by CARB using statewide data, or calculated based on surrogate variables.

<u>Mobile Sources</u>

Mobile sources include on-road motor vehicles such as automobiles, trucks and buses, as well as off-road sources such as construction equipment, boats, trains and aircraft. Estimates of on-road motor vehicle emissions include consideration of the fleet mix (vehicle type, model year, and accumulated mileage), miles traveled, ambient temperatures, vehicle speeds, and vehicle emission factors, as developed from comprehensive CARB testing programs. The Air District also receives vehicle registration data from the Department of Motor Vehicles. Some of these variables change from year to year, and the projections are based upon expected changes. Emissions from off-road mobile sources are calculated using various emission factors and methodologies provided by CARB and U.S. EPA.

3.2.2.2 Non-Criteria Pollutants

Although the primary mandate of the Air District is attaining and maintaining the national and State Ambient Air Quality Standards for criteria pollutants within the Air District jurisdiction, the Air District also has a general responsibility to control, and where possible, reduce public exposure to airborne toxic compounds. The State and federal government have set health-based ambient air quality standards for criteria pollutants. The air toxics program was established as a separate and complementary program designed to evaluate and reduce adverse health effects resulting from exposure to toxic air contaminants (TACs).

Toxic Air Contaminants

The Air District monitors and maintains a database that contains information concerning emissions of TACs from permitted stationary sources in the Bay Area. This inventory, and a similar inventory for mobile and area sources compiled by CARB, is used to plan strategies to reduce public exposure to TACs. The most recent inventory of TAC monitoring data (2014) is provided in Table 3.2-5 and Table 3.2-6.

TABLE 3.2-5
Summary of 2014 BAAQMD Ambient Air Toxics Monitoring Data

Compound	**Max. Conc. (ppb) (1)**	**Min. Conc. (ppb) (2)**	**Mean Conc. (ppb) (3)**
1,3-Butadiene	3.75E-01	0.00E+00	4.39E-02
Acetaldehyde	5.83E+00	2.00E-01	1.11E+00
Acrolein	2.00E+00	0.00E+00	2.05E-01
Benzene	2.81E+01	0.00E+00	5.94E-01
Carbon Tetrachloride	1.49E-01	5.70E-02	9.62E-02
Chloroform	1.09E-01	0.00E+00	2.73E-02
Dichloromethane	1.62E+00	0.00E+00	2.26E-01
Ethylbenzene	1.10E+01	0.00E+00	2.62E-01
Ethylene Dibromide	0.00E+00	0.00E+00	0.00E+00
Ethylene Dichloride	1.40E-02	0.00E+00	7.68E-05
Formaldehyde	6.18E+00	5.00E-01	2.07E+00
Methyl Chloroform	2.61E+00	0.00E+00	1.90E-02
Naphthalene	2.72E+02	1.47E+01	5.97E+01
N-Hexane	1.73E+01	0.00E+00	6.68E-01
Styrene	7.03E+00	0.00E+00	1.31E-01
Tetrachloroethylene	3.12E-01	0.00E+00	1.43E-02
Toluene	8.24E+01	0.00E+00	1.78E+00
Trichloroethylene	2.22E-01	0.00E+00	4.57E-03
Vinyl Chloride	2.10E-02	0.00E+00	3.66E-05

Compound	Max. Conc. (ppb) (1)	Min. Conc. (ppb) (2)	Mean Conc. (ppb) (3)
m/p-Xylene	2.99E+01	0.00E+00	9.82E-01
O-Xylene	1.00E+01	0.00E+00	3.68E-01

Source: BAAQMD, 2014

NOTES: Table 3.2-5 summarizes the results of the Air District gaseous toxic air contaminant monitoring network for the year 2014. These data represent monitoring results at 25 separate sites at which samples were collected.

(1) "Maximum Conc." is the highest daily concentration measured at any of the 25 monitoring sites.

(2) "Minimum Conc." is the lowest daily concentration measured at any of the 25 monitoring sites.

(3) "Mean Conc." is the arithmetic average of the air samples collected in 2014 at the 25 monitoring sites.

Health Effects

TACs can cause or contribute to a wide range of health effects. Acute (short-term) health effects may include eye and throat irritation. Chronic (long-term) exposure to TACs may cause more severe effects such as neurological damage, hormone disruption, developmental defects, and cancer. CARB has identified roughly 200 TACs, including diesel particulate matter (diesel PM) and environmental tobacco smoke.

Unlike criteria pollutants which are subject to ambient air quality standards, TACs are primarily regulated at the individual emissions source level based on risk assessment. Human outdoor exposure risk associated with an individual air toxic species is calculated as its ground-level concentration multiplied by an established unit risk factor for that air toxic species. Total risk due to TACs is the sum of the individual risks associated with each air toxic species.

Occupational health studies have shown diesel PM to be a lung carcinogen as well as a respiratory irritant. Benzene, present in gasoline vapors and also a byproduct of combustion, has been classified as a human carcinogen and is associated with leukemia. 1,3-butadiene, produced from motor vehicle exhaust and other combustion sources, has also been associated with leukemia. Reducing 1,3-butadiene also has a co-benefit in reducing the air toxic acrolein.

Acetaldehyde and formaldehyde are emitted from fuel combustion and other sources. They are also formed photo-chemically in the atmosphere from other compounds. Both compounds have been found to cause nasal cancers in animal studies and are also associated with skin and respiratory irritation. Human studies for carcinogenic effects of acetaldehyde are sparse but, in combination with animals studies, sufficient to support classification as a probable human carcinogen. Formaldehyde has been associated with nasal sinus cancer and nasopharyngeal cancer, and possibly with leukemia.

The primary health risk of concern due to exposure to TACs is the risk of contracting cancer. The carcinogenic potential of TACs is a particular public health concern because many scientists currently believe that there are not "safe" levels of exposure to carcinogens without some risk to causing cancer. The proportion of cancer deaths attributable to air pollution has not been estimated using epidemiological methods. Based on ambient air quality monitoring, and using

TABLE 3.2-6
Concentration of Toxic Air Contaminants in the Bay Area (2014)

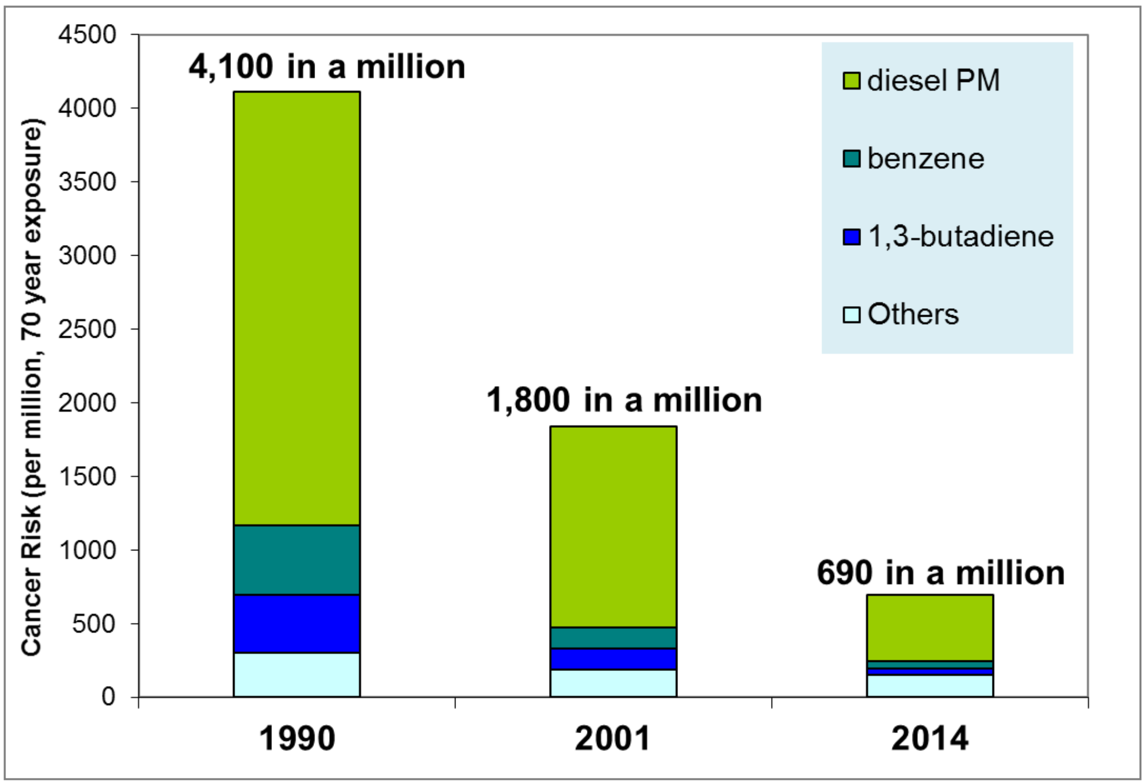
Monitoring Station	Chemical[1]										
(mean ppb)	BENZ	CCl_4	$CHCl_3$	DCM	EBZ	EDB	EDC	PERC	TCE	TOL	VC
Bethel Island	1.17E-01	9.82E-02	2.07E-02	1.94E-01	2.66E-02	0.00E+00	4.83E-04	2.79E-03	1.28E-03	2.05E-01	0.00E+00
Concord - Treat Blvd	1.45E-01	9.33E-02	3.34E-02	1.95E-01	4.09E-02	0.00E+00	0.00E+00	8.47E-03	8.67E-04	2.27E-01	0.00E+00
Crockett - Kendall Ave	9.72E-02	9.54E-02	1.71E-02	2.04E-01	2.18E-02	0.00E+00	0.00E+00	1.28E-02	3.67E-04	1.36E-01	0.00E+00
Ft. Cronkhite Building 1111	7.19E-02	9.29E-02	1.53E-02	1.75E-01	2.11E-02	0.00E+00	0.00E+00	2.21E-03	0.00E+00	1.50E-01	0.00E+00
Laney College	2.10E-01	9.43E-02	2.35E-02	2.08E-01	7.19E-02	0.00E+00	0.00E+00	8.50E-03	0.00E+00	5.45E-01	0.00E+00
Livermore - Rincon Ave.	8.14E-01	9.76E-02	3.10E-02	2.46E-01	4.59E-01	0.00E+00	0.00E+00	2.04E-02	0.00E+00	2.84E+00	0.00E+00
Martinez - Jones St	1.35E-01	9.52E-02	1.80E-02	2.12E-01	4.20E-02	0.00E+00	0.00E+00	2.72E-03	0.00E+00	2.52E-01	0.00E+00
Napa - Jefferson St	2.22E-01	9.89E-02	4.01E-02	2.69E-01	7.72E-02	0.00E+00	0.00E+00	8.76E-03	1.93E-03	5.05E-01	0.00E+00
Oakland - International	2.51E-01	1.03E-01	3.32E-02	2.17E-01	9.69E-02	0.00E+00	0.00E+00	1.64E-02	8.47E-03	6.12E-01	0.00E+00
Oakland West	2.15E-01	1.02E-01	2.95E-02	2.57E-01	9.14E-02	0.00E+00	0.00E+00	1.34E-02	4.73E-03	5.36E-01	0.00E+00
Patterson Pass - PAMS	3.73E-01	NA	NA	NA	1.06E-01	NA	NA	NA	NA	7.13E-01	NA
Redwood City	2.78E-01	9.83E-02	4.70E-02	2.84E-01	1.94E-01	0.00E+00	4.29E-04	1.50E-02	4.98E-02	8.58E-01	7.50E-04
Richmond - 7th St	1.35E-01	9.82E-02	2.67E-02	2.31E-01	5.73E-02	0.00E+00	0.00E+00	3.80E-03	3.33E-04	3.09E-01	0.00E+00
San Francisco - Arkansas St.	1.89E-01	9.18E-02	2.50E-02	1.64E-01	9.07E-02	0.00E+00	0.00E+00	8.67E-03	5.36E-03	3.78E-01	0.00E+00
San Jose - Jackson St.	2.53E-01	9.72E-02	3.06E-02	2.81E-01	1.21E-01	0.00E+00	1.67E-04	4.93E-02	3.91E-03	6.64E-01	0.00E+00
San Jose - Knox Av	3.62E-01	9.71E-02	3.05E-02	2.30E-01	1.46E-01	0.00E+00	0.00E+00	5.23E-03	0.00E+00	9.43E-01	0.00E+00
San Pablo - Rumrill	1.66E-01	9.41E-02	2.56E-02	2.69E-01	6.74E-02	0.00E+00	0.00E+00	3.10E-03	0.00E+00	4.12E-01	0.00E+00
San Rafael	1.64E-01	9.53E-02	2.30E-02	1.88E-01	4.69E-02	0.00E+00	0.00E+00	1.23E-02	5.61E-03	4.33E-01	0.00E+00
San Ramon	6.20E-01	NA	NA	NA	2.25E-01	NA	NA	NA	NA	1.84E+00	NA
Sebastopol	1.46E-01	9.22E-02	2.13E-02	2.30E-01	4.97E-02	0.00E+00	1.38E-04	2.72E-03	3.41E-03	2.96E-01	0.00E+00
Vallejo - Tuolumne St.	1.66E-01	9.51E-02	2.62E-02	2.02E-01	5.90E-02	0.00E+00	1.43E-04	4.75E-03	3.21E-04	3.87E-01	0.00E+00

(1) BENZ = benzene, CCl_4 = carbon tetrachloride, $CHCl_3$ = chloroform, DCM = methylene chloride, EBZ = ethyl benzene EDB = ethylene dibromide, EDC = ethylene dichloride, PERC = perchloroethylene,, TCE = trichloroethylene, TOL = toluene, and VC = vinyl chloride. NA = Not available.
Source: BAAQMD, 2016.

OEHHA cancer risk factors,[1] the estimated lifetime cancer risk for Bay Area residents, over a 70-year lifespan from all TACs combined, declined from 4,100 cases per million in 1990 to 690 cases per million people in 2014, as shown in Figure 3.2-5. This represents an 80 percent decrease between 1990 and 2014 (BAAQMD, 2016).

The cancer risk related to diesel PM, which accounts for most of the cancer risk from TACs, has declined substantially over the past 15-20 years as a result of ARB regulations and Air District programs to reduce emissions from diesel engines. However, diesel PM still accounts for roughly 60 percent of the total cancer risk related to TACs.

FIGURE 3.2-5. Cancer-Risk Weighted Toxics Trends



Source: BAAQMD, 2016

[1] See CARB's Risk Management Guidance for Stationary Sources of Air Toxics, Discussion Draft, May 27, 2015, https://www.arb.ca.gov/toxics/rma/rma_guidancedraft052715.pdf and the Office Environmental Health Hazard Assessment's toxicity values at http://oehha.ca.gov/media/CPFs042909.pdf. The cancer risk estimates shown in Figure 3.2-5 are higher than the estimates provided in documents such as the Bay Area 2010 Clean Air Plan and the April 2014 CARE report entitled *Improving Air Quality and Health in Bay Area Communities*. It should be emphasized that the higher risk estimates shown in Figure 3.2-5 are due solely to changes in the methodology used to estimate cancer risk, and not to any actual increase in TAC emissions or population exposure to TACs.

3.2.3 REGULATORY SETTING

3.2.3.1 Criteria Pollutants

Ambient air quality standards in California are the responsibility of, and have been established by, both the U.S. EPA and CARB. These standards have been set at concentrations, which provide margins of safety for the protection of public health and welfare. Federal and state air quality standards are presented in Table 3.2-2, below under Air Quality Environmental Setting. The federal, state, and local air quality regulations are identified below in further detail.

3.2.3.1.1 Federal Regulations

The U.S. EPA is responsible for setting and enforcing the National Ambient Air Quality Standards for oxidants (ozone), CO, NOx, SOx, PM10, PM2.5, and lead. The U.S. EPA has jurisdiction over emissions sources that are under the authority of the federal government including aircraft, locomotives, and emissions sources outside state waters (Outer Continental Shelf). The U.S. EPA also establishes emission standards for vehicles sold in states other than California. Automobiles sold in California must meet the stricter emission requirements of the CARB.

The Clean Air Act (CAA) Amendments of 1990 give the U.S. EPA additional authority to require states to reduce emissions of ozone precursors and particulate matter in non-attainment areas. The amendments set attainment deadlines based on the severity of problems. At the state level, CARB has traditionally established state ambient air quality standards, maintained oversight authority in air quality planning, developed programs for reducing emissions from motor vehicles, developed air emission inventories, collected air quality and meteorological data, and approved state implementation plans. At a local level, California's air districts, including the Air District, are responsible for overseeing stationary source emissions, approving permits, maintaining emission inventories, maintaining air quality stations, overseeing agricultural burning permits, and reviewing air quality-related sections of environmental documents required by CEQA.

Other federal regulations applicable to the Bay Area include Title III of the Clean Air Act, which regulates toxic air contaminants. Title V of the Act establishes a federal permit program for large stationary emission sources. The U.S. EPA also has authority over the Prevention of Significant Deterioration (PSD) program.

3.2.3.1.2 California Regulations

CARB, which became part of the California Environmental Protection Agency in 1991, is responsible for ensuring implementation of the California Clean Air Act and federal Clean Air Act, and for regulating emissions from consumer products and motor vehicles. CARB has established California Ambient Air Quality Standards for all pollutants for which the federal government has established National Ambient Air Quality Standards and also has standards for sulfates, visibility, hydrogen sulfide and vinyl chloride. Federal and state air quality standards are presented in Table 3.2-2 under Air Quality Environmental Setting. California standards are generally more stringent than the National Ambient Air Quality Standards. CARB has established emission standards for vehicles sold in California and for various types of combustion equipment. CARB also sets fuel specifications to reduce vehicular emissions.

CARB released the Proposed 2016 State Strategy for the State Implementation Strategy on May 17, 2016. The measures contained in the State SIP Strategy reflect a combination of state actions, petitions for federal action, and actions for deployment of cleaner technologies in all sectors. CARB's proposed state SIP Strategy includes control measures for on-road vehicles, locomotives, ocean going vessels, and off-road equipment that are aimed at helping all districts in California to comply with federal and state ambient air quality standards.

California gasoline specifications are governed by both state and federal agencies. During the past two decades, federal and state agencies have imposed numerous requirements on the production and sale of gasoline in California. CARB adopted the Reformulated Gasoline Phase III regulations in 1999, which required, among other things, that California phase out the use of MTBE in gasoline. The CARB Reformulated Gasoline Phase III regulations have been amended several times (the most recent amendments were adopted in 2013) since the original adoption by CARB.

The California Clean Air Act (AB2595) mandates achievement of the maximum degree of emission reductions possible from vehicular and other mobile sources in order to attain the state ambient air quality standards by the earliest practical date.

3.2.3.1.3 Air District Regulations

The California Legislature created the Air District in 1955. The Air District is responsible for regulating stationary sources of air pollution in the nine counties that surround San Francisco Bay: Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, southwestern Solano, and southern Sonoma counties. The District is governed by a 24-member Board of Directors composed of publicly-elected officials apportioned according to the population of the represented counties. The Board has the authority to develop and enforce regulations for the control of air pollution within its jurisdiction. The District is responsible for implementing emissions standards and other requirements of federal and state laws. Numerous regulations have been developed by the District to control emissions sources within its jurisdiction. It is also responsible for developing air quality planning documents required by both federal and state laws.

3.2.3.2 Toxic Air Contaminants

3.2.3.2.1 Federal and State Regulations

TACs are regulated in the District through federal, state, and local programs. At the federal level, TACs are regulated primarily under the authority of the CAA. Prior to the amendment of the CAA in 1990, source-specific NESHAPs were promulgated under Section 112 of the CAA for certain sources of radionuclides and Hazardous Air Pollutants (HAPs).

Title III of the 1990 CAA amendments requires U.S. EPA to promulgate NESHAPs on a specified schedule for certain categories of sources identified by U.S. EPA as emitting one or more of the 189 listed HAPs. Emission standards for major sources must require the maximum achievable control technology (MACT). MACT is defined as the maximum degree of emission reduction achievable considering cost and non-air quality health and environmental impacts and energy requirements. All NESHAPs were to be promulgated by the year 2000. Specific incremental progress in establishing standards were to be made by the years 1992 (at least 40 source categories), 1994 (25 percent of the listed categories), 1997 (50 percent of remaining listed categories), and 2000 (remaining balance). The 1992 requirement was met; however, many of the four-year standards were not promulgated as scheduled. Promulgation of those standards has been rescheduled based on court ordered deadlines, or the aim to satisfy all Section 112 requirements in a timely manner.

Many of the sources of TACs that have been identified under the CAA are also subject to the California TAC regulatory programs. CARB developed three regulatory programs for the control of TACs. Each of the programs is discussed in the following subsections.

Control of TACs Under the TAC Identification and Control Program: California's TAC identification and control program, adopted in 1983 as Assembly Bill 1807 (AB 1807) (California Health and Safety Code §39662), is a two-step program in which substances are identified as TACs, and airborne toxic control measures (ATCMs) are adopted to control emissions from specific sources. Since adoption of the program, CARB has identified 18 TACs, and CARB adopted a regulation designating all 189 federal HAPs as TACs.

Control of TACs Under the Air Toxics "Hot Spots" Act: The Air Toxics Hot Spot Information and Assessment Act of 1987 (AB 2588) (California Health and Safety Code §39656), as amended by Senate Bill (SB) 1731, establishes a state-wide program to inventory and assess the risks from facilities that emit TACs and to notify the public about significant health risks associated with those emissions. AB2588 requires operators of certain stationary sources to inventory air toxic emissions from their operations and, if directed to do so by the local air district, prepare a health risk assessment to determine the potential health impacts of such emissions. If the health impacts are determined to be "significant" (greater than 10 per million exposures or non-cancer chronic or acute hazard index greater than 1.0), each facility must, upon approval of the health risk assessment, provide public notification to affected individuals.

California also has established a state air toxics program (AB1807, Tanner) which was revised by the new Tanner Bill (AB2728). This program sets forth provisions to the federal NESHAP program for control of hazardous air pollutants.

3.2.3.2.2 District TAC Regulations

The Air District uses three approaches to reduce TAC emissions and to reduce the health impacts resulting from TAC emissions: 1) Specific rules and regulations; 2) Pre-construction review; and, 3) the Air Toxics Hot Spots Program.

District Rules and Regulations: The Air District has a number of rules that reduce or control emissions from stationary sources. A number of regulations that control criteria pollutant emissions also control TAC emissions. For example, inspection and maintenance programs for fugitive emission sources (e.g., pumps, valves and flanges) control ROG emissions, some of which may also be TAC emissions.

Preconstruction Review: The Air District's Regulation 2, Rule 5 is a preconstruction review requirement for new and modified sources of TACs implemented through the Air District's permitting process. This rule includes health impact thresholds, which require the use of the best available control technology for TAC emissions (TBACT) for new or modified equipment, and health risk limits cannot be exceeded for any proposed project.

Air Toxics Hot Spots Program: The Air Toxic Hot Spots program, or AB2588 Program, is a statewide program implemented by each individual air district pursuant to the Air Toxic Hot Spots Act of 1987 (Health and Safety Code Section 44300 et. seq.). The Air District uses standardized procedures to identify health impacts resulting from industrial and commercial facilities and encourage risk reductions at these facilities. Health impacts are expressed in terms of cancer risk and non-cancer hazard index. Under this program, the Air District uses a prioritization process to identify facilities that warrant further review. This prioritization process uses toxic emissions data, health effects values for TACs, and Air District approved calculation procedures to determine a cancer risk prioritization score and a non-cancer prioritization score for each site. The District updates the prioritization scores annually based on the most recent toxic emissions inventory data for the facility.

In 1990, the Air District Board of Directors adopted the current risk management thresholds pursuant to the Air Toxic "Hot Spots" Act of 1987. These risk management thresholds, which are summarized in Table 3.2-7 below, set health impact levels that require sites to take further action, such as conducting periodic public notifications about the site's health impacts and implementing mandatory risk reduction measures.

TABLE 3.2-7
Summary of Bay Area Air Toxics Hot Spots Program Risk Management Thresholds

Requirement	Site Wide Cancer Risk	Site Wide Non-Cancer Hazard Index
Public Notification	Greater than 10 in one million	Greater than 1
Mandatory Risk Reduction	Greater than 100 in one million	Greater than 10

Community Air Risk Evaluation (CARE) Program: In 2004, Air District established the Community Air Risk Evaluation (CARE) program to identify locations with high emissions of TACs and other pollutants and high exposures of sensitive populations to these pollutants and to use this information to help establish policies to guide mitigation strategies that obtain the greatest health benefit from emission reductions. For example, Air District will use information derived from the CARE program to develop and implement targeted risk reduction programs, including grant and incentive programs, community outreach efforts, collaboration with other governmental agencies, model ordinances, new regulations for stationary sources and indirect sources, and advocacy for additional legislation.

The CARE program was initiated to evaluate and reduce health risks associated with exposures to outdoor TACs and other pollutants in the Bay Area. The program examines emissions from point sources, area sources, and on-road and off-road mobile sources with an emphasis on diesel exhaust, which is a major contributor to airborne health risk in California. The main objectives of the program are to:

- Characterize and evaluate potential cancer and non-cancer health risks associated with exposure to TACs and other pollutants from both stationary and mobile sources throughout the Bay Area.
- Assess potential exposures to sensitive receptors including children, senior citizens, and people with respiratory illnesses.
- Identify significant sources of emissions and prioritize use of resources to reduce exposure in the most highly impacted areas (i.e., priority communities).
- Develop and implement mitigation measures - such as grants, guidelines, or regulations - to achieve cleaner air for the public and the environment, focusing initially on priority communities.

The CARE program is an on-going program that encourages community involvement and input. The technical analysis portion of the CARE program is being implemented in three phases that includes an assessment of the sources of TAC emissions, modeling and measurement programs to estimate concentrations of TAC, and an assessment of exposures and health risks. Throughout the program, information derived from the technical analyses will be used to focus emission reduction measures in areas with high TAC exposures and high density of sensitive populations.

3.2.4 SIGNIFICANCE CRITERIA

The threshold of significance that the Air District will use to evaluate potential impacts on regional air quality challenges such as ozone will be "no net increase" in regional emissions of pollutants that contribute to these challenges as a result of the control strategy in the 2017 Plan. These pollutants include the criteria pollutants for which NAAQS have been established. If the control strategy will result in a net reduction in regional emissions of these pollutants, it will have no impact on regional air quality challenges. If it will result in a net increase in regional emissions, the Air District would consider that to constitute a significant adverse impact on air quality.

In addition, the Air District will also (to the extent feasible) evaluate whether the control strategy in the 2017 Plan could have the potential to create localized air quality impacts that could be significant. This outcome could occur if the control strategy results in an increase in emissions in one specific area that causes or significantly contributes to a hazard to public health or the environment, even if there is no net increase in emissions regionally. For criteria pollutants, the threshold of significance the Air District will use will be whether the control strategy will result in a localized "hot spot" in which ambient concentrations of the pollutant exceed an established ambient air quality standard. For TACs, the Air District will use two thresholds of significance, one for carcinogenic health impacts and one for non-carcinogenic health impacts. For non-carcinogenic impacts, the Air District will use a "Hazard Index" of 1 as the threshold of significance. A Hazard Index of 1 is the level of exposure below which there are not expected to be any observable adverse health effects, based on scientific studies. If the control strategy will result in localized concentrations of TACs that will expose people to a Hazard Index greater than 1.0, that will be considered a significant impact. For carcinogenic impacts, the Air District will use a threshold of "100 in one million" increased risk from all emissions sources within 1,000 feet. This means an exposure level that would be expected to produce 100 additional cancer cases if a population of one million people were exposed to that level of exposure over a 70-year lifetime. Under this threshold, there will be a significant localized impact if any person will be subjected to an additional carcinogenic risk of 100 in one million, taking into account all of the net increases in TAC emissions that will occur as a result of the control strategy within 1000 feet of the person.

3.2.5 ENVIRONMENTAL IMPACTS

As previously discussed, the proposed 2017 Plan sets forth a comprehensive roadmap for Air District actions over the next few years to reduce air pollution and protect public health and the global climate. These Air District actions are described in detail in Chapter 5 of the 2017 Plan (and in Volume II, which outlines the individual control measures), and they include:

1. Adopting mandatory regulations requiring stationary-source facilities to take actions to reduce their air emissions, pursuant to the District's rulemaking authority under the California Health & Safety Code;

2. Using the District's grants and incentives programs to provide monetary incentives for implementing voluntary actions to reduce emissions; and

3. Technical support, educational outreach, and advocacy efforts to promote sound policy development and healthy air quality choices throughout all sectors of our economy and society, including promoting best practices by public agencies and other entities through informational resources, model ordinances, guidance documents, and the like; outreach and education to engage with community groups and other organizations; and advocacy in support of legislative and regulatory action at the federal and state levels in order to promote the District's air quality, public health, and climate protection goals.

The proposed control strategy for the 2017 Plan consists of eighty-five distinct measures targeting a variety of local, regional and global pollutants. Some measures are expected to reduce the full set of air pollutants and greenhouse gases (GHGs), while others target a limited subset of pollutants. Table 3.2-8 summarizes the expected emission reductions associated with implementation of the 2017 Plan (see Volume II of the 2017 Plan and Appendix C). For some measures, emissions could not be estimated at this time. Estimating the emissions reductions of the control strategy is complicated by the fact that various control measures affect numerous emission sources, and a wide variety of implementation or compliance actions could be employed. In addition, the outcome of certain implementation actions (such as pursuing partnerships and collaborations, promoting adoption of model ordinance and best practices by local agencies, legislative advocacy, and public outreach and education) are impossible to quantify with any degree of certainty. In other cases, emission factors or methodologies have not yet been developed, additional technical information may be required, and the level of uncertainty is just too high to make a reasonable estimate of emission reductions associated with a particular control measure. Because of these challenges, the District will not provide any emission reduction estimates associated with some of the control measures.

Table 3.2-8 also lists only those measures where a reasonable estimate could be made of the potential emission reductions that could be expected from implementation of the control measure. In addition, there were some control measures where emission reduction estimates were made but not included in Table 3.2-8 because the control measures would be implemented by others, such as MTC; the potential impacts from the control measures could not be evaluated at this time so the emission reductions associated with the control measures were not included in Table 3.2-8; or the rule or regulation has already been adopted (e.g., SS2) by the Air District.

However, all proposed control measures are expected to reduce emissions of air pollutants and/or GHGs, either directly or indirectly, even if no specific emission reduction estimate can be provided at this time. The Air District will not proceed with implementation of a control measure if at the time of implementation, it cannot be determined that the control measure will result in cost effective reductions of either criteria pollutants, greenhouse gases or toxic air contaminants.

Even with these limitations, implementation of the 2017 Plan is expected to result in a substantial reduction in air pollution (including GHGs as discussed in section 3.3). This includes approximately: 1,600 tons per year of ROG; 3,000 tons per year of NOx; 500 tons per year of PM2.5; and 2,600 tons per year of SO2.

TABLE 3.2-8
2017 Plan Estimated Emission Reductions
From Potential Future Regulatory & Non-Regulatory Actions

No.	Title	2030 Estimated Criteria Air Pollutants Emission Reductions (lbs/day)			
		ROG	NO_X	$PM_{2.5}$	SO_2
Stationary Source/Transportation/Waste Sectors					
SS1	Fluid Catalytic Cracking in Refineries			1,222	
SS5	Sulfur Recovery Units				900
SS6	Refinery Fuel Gas				6,000
SS7	Sulfuric Acid Plants				2,800

No.	Title	2030 Estimated Criteria Air Pollutants Emission Reductions (lbs/day)			
		ROG	NO_X	$PM_{2.5}$	SO_2
SS14	Methane from Capped Wells				
SS15	Natural Gas Processing and Distribution				
SS19	Portland Cement				4,493
SS22	Stationary Gas Turbines		1,500		
SS23	Biogas Flares		920		
SS28	LPG, Propane, Butane	5,000			
SS29	Asphaltic Concrete	400			
SS30	Residential Fan Type Furnaces		13,200		
SS31	General PM Emissions Limits			300	
SS32	Emergency Backup Generators				
SS34	Wood Smoke			60	
SS35	PM from Coke, Coal Storage and Handling			4	
SS36	PM from Track Out			360	
SS37	PM from Asphalt Operations			175	
TR14	Cars and Light Trucks	64	64	14	
TR19	Medium and Heavy Duty Trucks	44	362	10	
TR20	Ocean Going Vessels		38		
TR23	Lawn Care Equipment	2,835	315	630	
WA1	Landfills	400			
	TOTAL – lb/day (criteria pollutants)	8,743	16,399	2,775	14,193
	Total – tons/yr (criteria pollutants)	1,596	2,993	506	2,590

This subchapter identifies and quantifies direct and indirect air pollutant emissions anticipated to occur as a result of implementing the various control measures, including potential increases that could occur as a consequence of efforts to improve air quality through the installation of emission control equipment, such as thermal oxidizers or wet gas scrubbers, or during construction activity. Please see Section 3.1 for further description and discussion of the air pollution control equipment that may be installed due to implementation of control measures in the 2017 Plan.

Regarding the Air District's proposed stationary-source regulatory measures, the District found in the Initial Study that the installation of new or replacement equipment, including air pollution controls, that some of the control measures in the 2017 Plan could have ancillary increased emissions that could impact either regional or local air quality which could offset the overall emission reductions expected from the Plan. For example, implementation of some of the control measures could involve retrofitting, replacing, or installing new air pollution control equipment, changes in product formulations, or construction of infrastructure that have the potential to increase emissions. In addition, some of the control measures could result in a slight increase in emissions from one pollutant in order to effectively reduce other emissions from the same source. Therefore, this air quality analysis evaluates whether any potential ancillary adverse air quality impacts would offset the net emission reductions anticipated from implementation of the 2017 Plan. This analysis includes an evaluation of potential significant cumulative regional and local air quality impacts, either through net increases in emissions region-wide or through local increases in emissions that would result in significant localized impacts. This air quality analysis also evaluates the potential for the Plan to cause or contribute to violations of any applicable air quality standards or to expose sensitive receptors to substantial concentration of TACs or other pollutants that could cause an increased health risk.

Evaluation of Stationary Source Control Equipment/Strategies

All of the air pollution control technologies that may be used to comply with future regulatory requirements are listed in Table 3.2-9, as well as potential secondary or indirect operational air quality impacts associated with each air pollution control technology. The air pollution control technologies listed in Table 3.2-9 that are not associated with any direct or indirect air quality impacts are not discussed in detail in the following air quality analysis. Those air pollution control technologies identified in Table 3.2-9 that have the potential to generate adverse direct or indirect operational air quality impacts will be evaluated.

Most air pollution control equipment reduces air emissions with no secondary air emissions generated from the equipment itself. Examples of air pollution control equipment that have no secondary emissions include baghouses, cyclones, diesel oxidation catalysts, diesel particulate filters (DPFs), electrostatic precipitators (ESPs), flue gas treatment, or selective oxidation catalyst. See Section 3.1.2.2.4 and Sections 3.1.2.2.7 of this EIR for a more detailed description of air pollution control technologies. However, because of the operation of certain air pollution control equipment, secondary emissions can be generated, examples of which include WGS, flue gas treatment, SCRs and thermal oxidizers. Details on the operation of the air pollution control equipment in Table 3.2-9 are provided in Chapter 3.1.2.2 – Applicable Emission Control Technologies in Chapter 3.0 of this EIR.

TABLE 3.2-9
Potential Operational Air Quality Impacts from Installing Air Pollution Control Equipment

Potential Control Technology	Potential Air Quality Impacts
Baghouse	None identified
Cyclone	None identified
Diesel Oxidation Catalyst	None identified
Diesel Particulate Filter	Slight NO_2 increase from regenerating filter, but overall NO2 reduction

Potential Control Technology	Potential Air Quality Impacts
Electrostatic Precipitator (Wet and Dry)	None identified
Flue Gas Treatment (Additive to Existing Amine System)	Slight increase in TAC (caustic) emissions
Flue Gas Treatment (Merox)	Slight increase in TAC (caustic) emissions
Selective Oxidation Catalyst	None identified
SOx Reducing Additive	None identified
Selective Catalytic Reduction	Minor increase in ammonia emissions.
Replace Old Diesel ICEs with New Diesel ICEs	None identified
Wet Gas Scrubber	Minor indirect mobile source emission increases
Thermal Oxider	Minor increase in combustion emissions
Carbon Adsorption	Minor increase in combustion emissions due to carbon regeneration; indirect mobile source emission increases

Wet Gas Scrubbers (WGS) are a cost effective control technology currently in operation in the Bay Area and primarily installed to reduce SO_2 emissions from oil processing at refineries which also reduces the potential for secondary PM formation. But WGS require for operation a catalyst and caustic solution on a daily basis. Therefore, indirect emissions occur from trucks delivering supplies (i.e., fresh catalyst and caustic solution to refill the storage tanks) on a regular basis is expected. Depending on the size and configuration of the WGS, the sodium hydroxide caustic solution used in the WGS would likely need to be delivered one time per week or a little over 50 additional delivery truck trips per year.

Because truck trips transporting the catalyst and caustic solutions would occur relatively infrequently and it is not likely that all affected facilities would reduce SO_2 or PM emissions using a WGS, a single truck's emissions delivering caustic solutions from San Jose to Benicia[2], for example, would be very low, a few pounds per day at most. As shown in Table 3.2-10, indirect mobile source emissions from transporting the caustic solutions would be low. Truck trip emissions from transporting caustic to affected facilities that install a WGS would not generate significant adverse operational air quality impacts alone, or contribute considerably to any significant cumulative adverse operational air quality impacts that may be caused by other control technologies.

Waste Disposal is expected to be required due to a number of control measures including any of the control measures that require demolition; emission control equipment that would use baghouses, particulate traps or other filters; catalyst replacement associated with air pollution control equipment (e.g., SCRs); carbon adsorption; retirement of equipment (e.g., lawn and garden equipment); and conversion of cars or trucks to electric vehicles. In order to estimate potential emissions associated with the transport of waste materials related to the plan it was assumed that two trucks per day or 730 trucks per year would be required.

[2] Review of caustic suppliers located a chemical supplier in San Jose. The haul truck trip from San Jose to the Valero Refining Company in Benicia would likely represent a conservative trip length assumption because trip lengths to all other affected facilities would be shorter.

TABLE 3.2-10
Potential Air Quality Impacts Associated with Transportation Activities Related to Air Pollution Control Equipment

Material	Trucks per year	Estimated Trip Length (roundtrip miles)	Emission Estimates (tons/year)					
			CO	ROG	NOx	SOx	PM10	PM2.5
Caustic/catalyst for 6-8 WGSs	300 – 400	120	0.30	0.075	0.79	0.001	0.102	0.051
Ammonia for 10 SCRs	400	100	0.247	0.062	0.654	0.001	0.043	0.085
Sodium bicarbonate	205		0.57	0.02	0.09	0	4.78	0.83
Waste Disposal	730	150	0.17	0.67	1.77	0.01	0.11	0.12

Dry Sorbent Injection (DSI) is a cost effective control technology currently in operation in the Bay Area to reduce SO2 emissions from Coke Calcining operations. It is anticipated that the DSI emission control systems at the two facilities that use this technology will need to be upgraded to further reduce SO2 emissions. Dry sodium bicarbonate is the catalyst used to react with SO2 in the process stream. These upgrades will result in a greater use of dry sodium bicarbonate and result in additional truck transport. Compliance with the revised rule (SS8) is expected to result in an increase in the transport of sodium bicarbonate of approximately 205 trucks per year, with a relatively minor increase in daily emissions as identified in Table 3.2-10.

Truck trip emissions from transporting dry sodium bicarbonate to affected facilities that utilize DSI control technology would not generate significant adverse operational air quality impacts alone.

Diesel Internal Combustion Engines (ICEs) are often used to provide electricity in certain areas of a facility, used as a backup source of electricity in the event of a power outage, or to operate equipment in areas of a facility with no other power source. ICE's can be a substantial source of emissions, including diesel particulate matter emissions (which are carcinogenic TACs) from a facility depending on its age and frequency of use. A common way to reduce TAC emissions from a facility would be to replace existing ICEs with newer ICEs. Over the past several decades, emission limits for diesel ICEs have been established and modified. Initial emission limits for ICEs were for engines referred to as Tier 1 ICEs. ICEs compliant with current emission limits are known as Tier 4 ICEs. Tier 4 ICEs are more efficient than Tier 1 ICEs and emit less pollutants. Facilities could comply with future regulations to reduce criteria pollutants, as well as, diesel particulate matter (a TAC) by replacing older ICEs (e.g., Tier 1) with new Tier 4 ICEs. Table 3.2-11 shows the estimated emission reductions associated with the use of Tier 4 engines as compared to Tier 1 engines.

Table 3.2-11
Emission Reductions Associated with New Diesel ICEs
Pounds per Horsepower-Hour(1)

Engine Tier	CO	VOC	NOx	PM
175-750 Hp Diesel ICE				
Tier 1	8.5	1	6.9	0.4
Tier 4	2.6	0.14	0.3	0.015
Reduction	69%	86%	96%	96%
750+ Hp Diesel ICE				
Tier 1	8.5	1	6.9	0.4
Tier 4	2.6	0.14	0.5	0.022
Reduction	69%	86%	93%	95%

(1) Based on 40 CFR Part 89 and 1039

Based on the above information and depending on the engine size, replacing older existing diesel ICEs with newer diesel ICEs, would result in an estimated reduction of 69 percent of CO, 86 percent reduction in VOC, 93-96 percent reduction in NOx, and 95-96 percent reduction in PM. Therefore, replacing existing diesel ICEs with new diesel ICEs is not expected to generate significant adverse operational air quality impacts.

Diesel Particulate Filters (DPFs) may result in a slight increase in directly emitted NOx during the regeneration of passive DPFs. In response to this undesirable effect, DPF manufacturers have improved their efforts to overcome increased NOx production by using other catalytic formulations or lowering the precious metal content of the traps. One DPF manufacturer has recently developed an improved DPF system capable of reducing PM emissions by at least 85 percent while also limiting NOx emissions to 25 percent compared to NOx emissions without a DPF. Limited test data for newer designs indicate that DPFs can reduce NOx emissions by six to ten percent, so overall there may be a small, but less than significant increase in NOx emissions and with some models there may be a net reduction in NOx emissions from operation of the filter. The Air District's implementation of the 2017 Plan subset measures is expected to result in a reduction of nearly 3,000 tons/year in NOx emissions. Compared to these emission reductions, DPFs are not expected to generate significant adverse operational air quality impacts or contribute to significant adverse operational air quality impacts that may be caused by other control technologies.

Other Emission Control Technologies/Strategies for further NOx emission reductions could include addition of control equipment like selective catalytic reduction (SCR), process changes to reduce emissions, and installation of new equipment that meets more stringent emission limits (e.g., new engines or low NOx burners). Process changes, such as a limitation on the throughput of equipment, or limitations on operating hours would not result in physical changes to stationary sources and, therefore, would not be expected to result in any adverse emission increases. Installation of new low emission equipment, such as low NOx burners, would not be expected to result in secondary air emissions as old equipment would be replaced with new equipment, which would only require minor construction emissions (e.g., delivery trucks).

SCRs have been used to control NOx emissions from stationary sources for many years. SCR promotes chemical reactions in the presence of a catalyst. Installation of new SCR equipment or increasing the control efficiency of existing equipment would be expected to increase the amount of ammonia used for NOx control. SCRs would require the additional delivery of ammonia or urea to the facilities where they are installed. It is estimated that about 40 truck trips per year would be required for the delivery of ammonia/urea. This amount could vary depending on the size of the SCR and size of the ammonia or urea storage systems. However, the 40 trucks per year is expected to provide a conservative estimate of transportation requirements. The emissions associated with these truck deliveries are included in Table 3.2-10 and are expected to be minor.

Control Measure SS22 (Stationary Gas Turbines) could reduce NOx by using SCRs on medium sized stationary gas turbines (50-250 mmbtu/hr), which may potentially result in increased ammonia emissions due to “ammonia slip” (release). This release can be in liquid form, thus, directly generating PM10 emissions, or it can be released in gaseous form, where it is a precursor to PM10. The amount of ammonia slip can increase as the catalyst ages and becomes less effective. However, ammonia slip from SCR equipment is continuously monitored and controlled per air district permits. The SCR technology has progressed such that ammonia slip can be limited to five parts per million (ppm) or less. SCR vendors have developed better injection systems that result in a more even distribution of NOx ahead of the catalyst so that the potential for ammonia slip has been reduced. Similarly, ammonia injection rates are more precisely controlled by model control logic units that are a combination of feed-back control and feed forward control using a proportional/integral controller that sets flow rates by predicting SCR outlet ammonia concentrations and calibrating them to a set reference value. Installation of an SCR system would require an Authority to Construct/Permit to Operate from the Air District in which a limit on the amount of ammonia slip is normally included. This limit would be enforced by requirements that operators monitor ammonia slip by conducting an annual source test and maintain a continuous emission monitoring system to accurately indicate the ammonia-to-emitted-NOx mole ratio at the inlet of the SCR. These measures are expected to minimize potential air quality impacts associated with ammonia slip from these sources. Based on 9 ppm ammonia slip, an SCR could emit between 0.6 to 3.1 pounds per hour for a medium sized turbine.

Thermal Oxidizers/Flares could be required by a number of control measures that would result in a decrease in VOC emissions from various facilities including: SS5 (Sulfur Recovery Units); SS11 (Petroleum Refining Facility-Wide Emission Limits); SS20 Air Toxics Risk Reduction from Existing Facilities); SS23 (Biogas Flares); and WA1 (Landfills). These methods to control VOC emissions include vapor recovery devices such as afterburners, incinerators, or flares, which result in indirect air emissions of NOx and CO emissions from combustion.

In the Negative Declaration for modifications to Rule 2-5 (Control Measure SS21 in the 2017 Plan), the potential air quality impacts included the emissions associated with the installation of thermal/catalytic oxidizers were calculated. The operational emissions associated with the installation of 80, 3.0 mm Btu/hr thermal oxidizers are summarized in Table 3.2-12. While some control measures may cause a small increase in CO and NOx emissions, the 2017 Plan control measures will achieve an overall reduction in VOC and NOx. The emission control devices require air permits to operate. Emissions from vapor recovery devices are generally controlled by using efficient combustion practices and enforced with permit conditions.

TABLE 3.2-12
Estimated Operational Emissions Impacts
(tons/yr)

Equipment	VOC	CO	NOx	SOx	PM10	PM2.5
Oxidizers	2.3	103.7	12.8	0.2	2.5	2.5

See IS/ND for Air District Rule 2-5.

Electricity

Electricity is often used as the power source to operate various components of add-on control equipment, such as ventilation systems, fan motors, vapor recovery systems, etc. Increased demand for electrical energy may require generation of additional electricity, which in turn could result in increased indirect emissions of criteria pollutants in the Bay Area and in other portions of California. The control measures that may encourage additional electricity use at stationary sources include SS1, SS5, SS6, SS7, SS11, SS20, SS22, SS31, TR20, and TR23. These control measures could encourage the use of additional emission control devices that could incentivize, encourage or require the use of additional electricity to replace fossil fuels. The potential emissions associated with these control measures are summarized in Table 3.2-13.

- SS1 – Fluid Catalytic Cracking in Refineries could result in the installation of wet gas scrubbers that would require the use of electricity.

- SS5 – Sulfur Recovery Units could require wet gas scrubbers and improved tail gas treatment at refineries that would require the use of electricity.

- SS7 – Sulfuric Acid Plants would require the use of wet gas scrubbers on 3 acid plants that would require the use of electricity.

- SS11 – Petroleum Refining Facility-Wide Emission Limits and Thresholds may require the use of additional air pollution control equipment that would require the use of electricity.

- SS20 –Air Toxics Risk Cap and Reduction from Existing Facilities is estimated to require the use of additional control equipment including oxidation catalysts, baghouses, thermal oxidizers and carbon adsorption systems, some of which would require the use of electricity.

- SS22 – Stationary Gas Turbines may require SCR on up to six facilities potentially that would require the use of electricity.

- SS31 – General PM Emission Limits would require additional baghouses or ESP on BART cleaning facilities that would require the use of electricity.

- TR20 – Ocean Going Vessels would require that marine vessels to use shore-side power while at berth, that would require the use of electricity.

- TR23 – Lawn and Garden Equipment would seek additional funding to replace lawn and garden equipment with electric equipment that would require the use of electricity.

TABLE 3.2-13
Estimated Indirect Electrical Emissions Impacts

Equipment	VOC	CO	NOx	SOx	PM10	PM2.5
Emission Factors (g/kwh)(1)	0.016	0.186	0.895	0.588	0.256	0.162
Total Emissions (tons/yr)(2)	4.5	52.4	252.3	165.8	72.2	45.7

(1) Emission factors from *Updated GHG and Criteria Air Pollutant Emission Factors of the U.S. Electric Generating Units in 2010.* (DOE, 2013).
(2) Based on 700.632 MWh/day for 365 days per year. See Table 3.8-4.

In addition to the above measures which could increase electricity demand at stationary sources, an increase in the use of electric vehicles would also require the generation of additional electricity in the Air District and other areas of California. The potential increase and amount of electricity is unknown. Because the control measures are general in nature, it is difficult to determine what, if any, impacts could be expected. Several control measures target emission reductions from transportation measures that would encourage the development of vehicle control technology to achieve zero emission vehicle standards. Such technology would include electric and hybrid electric vehicles as a result of advanced battery technology and development of property support infrastructure. The increased demand for electrical energy may require generation of additional electricity, which in turn may result in increased indirect emissions of all criteria pollutants (due to the increase in natural gas combustion used to generate more electricity). In addition, the amount of electricity generated is described in the energy impacts Subchapter 3.6 of this Draft EIR.

Electrification of motor vehicles and other commercial and industrial equipment will reduce petroleum fuel usage in the Bay Area. At that time, there may be an increase in emissions due to increased electric power generation due to increased demand. The number of fossil-fuel vehicles/equipment that would be replaced with electric vehicles/equipment is unknown at this time. While the control measures may cause an increase in NOx emissions associated with increased electricity generation, the generation of electricity using natural gas is expected to result in fewer emissions than vehicles and equipment that use fossil fuels.

If electricity demand exceeds available power, additional sources of electricity would be required. Electricity generation facilities within the Air District are subject to Regulation 9, Rule 9, which regulates NOx emissions (the primary pollutant of concern from combustion to generate electricity) and establishes NOx concentration limits. As a result, NOx emissions from existing electric generating facilities will not increase significantly, regardless of increased power generation for add-on control equipment or electrification activities.

New power generation equipment would also be subject to Regulation 9, Rule 9 and would not be expected to result in significant air quality impacts because they would be subject to Best Available Control Technology (BACT) requirements, and all emission increases would have to be offset (through emission reduction credits) before permits could be issued. Further, emissions from the combustion of gasoline or diesel fuels are generally the emissions that would be reduced when electrification is proposed and replaced with emissions from the combustion of natural gas (as would generally occur from electricity generating facilities). Emissions from diesel combustion (e.g., construction equipment) are orders of magnitude higher than emissions from the combustion of natural gas. So overall emissions are expected to decrease.

The Air District does not regulate electricity generating facilities outside of the Air District boundaries so the rules and regulations discussed above do not apply to electricity generating facilities outside of the Air District. About 66 percent of the electricity used in California is generated in-state, of which 24.5 percent came from renewable sources (biomass, solar, and wind power) and about 34 percent is imported (CEC, 2016b). While these electricity generating facilities would not be subject to Air District rules and regulations, they would be subject to the rules and regulations of the local air pollution control district and the U.S. EPA. These agencies also have established New Source Review regulations for new and modified facilities that generally require compliance with BACT or lowest achievable emission reduction technology. Most electricity generating plants use natural gas, which provides a relatively clean source of fuel (as compared to coal- or diesel-fueled plants). The emissions from these power plants would also be controlled by local, state, and federal rules and regulations, minimizing overall air emissions. These other air district rules and regulations may differ from the Air District rules and regulations because the ambient air quality and emission inventories in other air districts are different than those in the Bay Area. Compliance with the applicable air quality rules and regulations are expected to minimize air emissions in the other air districts.

Electricity in California is also generated by alternative sources that include hydroelectric plants, geothermal energy, wind power, and solar energy, which are clean sources of energy. California's renewables portfolio standard (RPS) requires retail sellers of electricity to increase their procurement of eligible renewable energy resources by at least one percent per year so that 20 percent of their retail sales are procured from eligible renewable energy resources by 2017. In 2011, RPS was further modified by Senate Bill 2 to require retailers to reach 33 percent renewable energy by 2020. Finally, in October 2015 the RPS was further modified to require that the amount of electricity generated and sold to retail customers per year from eligible renewable energy resources be increased to 50 percent by December 31, 2030. Among other objectives, the Legislature intends to double the energy efficiency savings in electricity and natural gas final end uses of retail customers through energy efficiency and conservation. These regulatory requirements are expected to move California towards the use of more renewable sources of electricity, reducing the use of fossil fuels. These renewable sources of electricity generate little, if any, air emissions. Increased use of these and other clean technologies will continue to minimize emissions from the generation of electricity. Therefore, the potential increase in emissions associated with increased electricity use in Table 3.2-13 are expected to be worst-case estimates and actual emissions associated with electricity use are expected to be less.

The 2017 Plan is designed to reduce criteria, GHG and TAC emissions in order to meet federal and state air quality standards, reduce exposure to TACs, and reduce impacts on climate change. The 2017 Plan has the potential to create impacts on electricity demand; however, the existing and future air quality and GHG rules and regulations are expected to minimize operational emissions associated with increased electrical generation. Furthermore, electricity providers are moving towards compliance with California's RPS and generate 50 percent of their electricity from renewable energy resources by 2030.

Lower VOCs Products

Several control measures could require reformulation of coatings, solvents, lubricants, adhesives (SS25), cleaning solvents (SS26) and digital printing inks (SS27) to reduce VOC emissions. It is expected that inks would be reformulated with a lower VOC content or use exempt compound formulations. Similar to Regulation 8, Rule 20 – Graphic Arts Printing and Coating Operations, SS27 may result in the substitution of reactive solvents with exempt compounds. The exempt compounds for Regulation 8-20 are limited to acetone, methyl acetate, parachlorobenzotrifluoride (PCBTF), and or methylated siloxanes (VMS). These compounds are not considered to be VOCs and, thus, their increase in use would not generate VOC emissions.

To obtain further VOC emission reductions from these products, the District proposes to review the regulations adopted by other air districts and reduce the VOC content for certain products where it is feasible to do so. It is expected the products would be reformulated with water-based or exempt compound formulations. Extensive research on potential emissions associated with reformulated products has been completed (SCAQMD, 2016). It was determined that future compliant materials are expected to contain less hazardous materials (or will contain nonhazardous materials) as compared to solvent-borne coatings, solvents, lubricants, adhesives, inks and cleaning materials, resulting in an environmental benefit. Therefore, the overall air quality impacts associated with the use of lower VOC products is expected to be a reduction in VOC emissions.

Toxic Air Contaminants

Some of the control measures for stationary and transportation sources will also reduce Toxic Air Contaminants (TACs). For example, control measures that result in reducing VOC emissions (such as SS28 – LPG, Propane, Butane; SS29 – Asphaltic Concrete; WA1 – Landfills; and TR23 – Lawn Care Equipment) would be expected to reduce TACs as well (benzene, toluene, ethylbenzene and xylene, for example). Control measures that reduce particulate matter could also reduce TAC emissions (SS1 could reduce ammonia emissions).

In general, it is expected that the 2017 Plan control measures would reduce TAC emissions because many TACs are also classified as VOCs and the 2017 Plan includes measure that would reduce VOC emissions by an estimated 8,743 lbs/day (1,596 tons/year).

Several control measures in the 2017 Plan may result in the use of ammonia in SCRs, including SS11, SS20, and SS22. BACT for NOx emissions may require the use of an SCR unit. In the Air District, ammonia slip from SCR units is generally limited to not exceed 5 to 10 ppmv due to toxics health risk, SCR performance requirements, and in association with the NOx BACT. As previously discussed, a medium sized turbine (50 to 250 mmbtu/hr) with a 9 ppm ammonia slip could emit between 0.6 to 3.1 pounds per hour of ammonia. The actual acute and chronic health risks from ammonia emissions from an SCR cannot be accurately determined without site specific information such as local meteorological data, stack height, stack temperature, and other operating parameters. Therefore, estimating the potential localized health risk associated with ammonia emissions is speculative. However, previously permitted SCRs in the District have shown, through source-specific permit modeling, to have no significant toxic impact on surrounding communities, as adjustments can be made to the stack location or stack height to increase dispersion and minimize impacts.

Section 3.4 of this Draft EIR includes an analysis comparing potential replacement solvents that may be used in future formulations to conventional solvents. For example, if future compliant products are formulated with chemicals that may have new or different health hazards than are currently used, potentially significant adverse health hazard impacts could occur from using some low VOC reformulated products. However, as indicated in the discussion in Section 3.4, the physical and chemical properties such as flammability exposure ratings (threshold limit value (TLV), permissible exposure limit (PEL), immediately dangerous to life and health (IDLH), and health effects) of future coating formulations are generally less or no worse than conventional solvents overall. Many compliant future products are expected to be formulated with water, which tend to contain less flammable and less toxic materials than solvent-based coatings and products. Finally, as with the use of all chemicals, facilities and their workers would be required to continue to comply with existing health protective equipment and procedures when handling both flammable and toxic materials. Consequently, future reformulated coatings and solvents are not expected to increase exposures to TAC emissions.

SS2 and SS14 are expected to result in reduced VOC from fugitive equipment leaks and capped wells and SS13 would reduce VOC emissions at oil and gas production facilities by improving leak detection and repair, thus providing an air quality benefit. In addition, some of the control measures (SS20, SS21, SS32) would likely result in a reduction of TAC emissions, e.g., the replacement of old ICEs with new ICEs and the replacement of old generators with new ones, resulting in a reduction of diesel particulate matter (DPM) from engine exhaust, which is a known carcinogen, and toxic components of gasoline such as benzene and 1,3-butadiene.

Some measures for motor vehicle and transportation source categories (TR4, TR10, TR11, TR12, TR14, TR19, and TR22) would reduce mobile source emissions, in particular, emissions of DPM from engine exhaust, and toxic components of gasoline such as benzene and 1,3-butadiene. For example, mobile source control measures that result in replacing diesel or gasoline engines with zero or hybrid electric vehicles, have the potential to reduce criteria pollutant emissions.

Combustion emissions of alternative fuels have trace amounts of methanol and aldehyde, but, generally, are considered to be cleaner and less toxic than diesel or gasoline fueled vehicles. Emissions from power generating equipment may include trace amounts of benzene, aldehydes, metals, and polynuclear aromatic hydrocarbons. However, if the process being electrified was previously powered by direct combustion of fossil fuels, then electrification is expected to result in an overall decrease in toxic emissions.

Based upon the above information, potential impacts associated with implementing the 2017 Plan are expected to be an overall reduction in TAC emissions. Therefore, implementing 2017 Plan is not expected to generate significant adverse air quality impacts from increased exposure to TAC emissions.

Potential Increase in Localized Emissions

The 2017 Plan includes some control measures that could potentially result in increased exposure to sensitive receptors from particulate matter and or toxic air contaminants. Stationary source control measures that would require control equipment be installed and require regular deliveries of products to support the air pollution control equipment will increase the number of heavy duty truck trips through some Bay Area communities. Where these trucks travel could increase emissions near sensitive receptors and increase the concentration of air pollutants they are exposed to. As discussed above, the potential increase in heavy duty trucks associated with new stationary source control equipment is relatively minor, increasing only modestly the number of additional trucks a day on Bay Area roadways. This level of increased truck travel and associated emissions would not be expected to result in any significant localized impacts to sensitive receptors because the truck traffic would be dispersed among the numerous stationary sources throughout the Bay Area.

In addition, existing Air District regulations would prevent existing or new stationary sources from adversely impacting nearby sensitive receptors due to TACs and PM2.5 based on emission limits included in Air District permits on their stationary source equipment and new source review requirements.

A more detailed focused analysis of potential localized air quality impacts for particulate matter and toxic air contaminants is not possible for this 2017 Plan due to a lack of specificity on how compliance with future control measure regulations would occur at a regulated facility. In such situations, CEQA does not contemplate an attempt to assess the significance of purely speculative localized air quality impacts in the EIR, as recognized in Section 15145 of the Guidelines. To the contrary, Section 15145 directs the analysis to conclude that there are no significant localized air quality impacts from any activities that could result from regulatory actions under the 2017 Plan that can be identified at this stage of the development and implementation of the Plan. Therefore, a more detailed localized air quality impact analysis is considered to be speculative and has not been completed for the 2017 Plan EIR.

Construction activity

Installation of air pollution control equipment or modification of operations to reduce emissions, including SS1, SS5, SS6, SS7, SS8, SS11, SS20, SS22, SS23, SS31, SS35, AG1, and WA1, would most likely result in an increase in emissions. For most of the construction activity necessary to comply with future regulations, it is impossible to predict at the 2017 Plan stage all of the construction activities that may be required, or how, when, or where they may be carried out. However, emissions associated with some general construction activities can be estimated for implementation of some of the control measures.

Construction activities associated with installing air pollution control technologies would result in VOC, NOx, SOx, CO, PM10, PM2.5, and GHG emissions, although the amount generated by specific types of equipment can vary greatly as shown in Table 3.2-14. As that table shows, different types of equipment can generate air emissions in much different quantities depending on the type of equipment. The estimated emissions of NOx range from of 0.1 lb/hr of NOx for a forklift to 1.81 lbs/hr for scrappers, for example. The estimated emissions for construction equipment operating on a typical eight-hour day are provided in Table 3.2-15. Depending on the nature and location of the construction activities, air emissions at these levels – especially at the upper end of this range – could result in substantial air emissions.

TABLE 3.2-14
Emission Factors Associated with Typical Construction Equipment(1)

Equipment Type	VOC (lb/hr)	CO (lb/hr)	NOx (lb/hr)	SOx (lb/hr)	PM (lb/hr)
Bore/Drill Rigs	0.04	0.50	0.57	0.00	0.02
Cranes	0.06	0.41	0.80	0.00	0.04
Excavators	0.03	0.52	0.35	0.00	0.01
Graders	0.07	0.58	0.93	0.00	0.04
Pavers	0.04	0.50	0.46	0.00	0.02
Paving Equipment	0.03	0.41	0.37	0.00	0.02
Rollers	0.03	0.39	0.27	0.00	0.02
Rough Terrain Forklifts	0.02	0.45	0.25	0.00	0.01
Rubber Tired Dozers	0.11	0.88	1.45	0.00	0.07
Rubber Tired Loaders	0.05	0.45	0.67	0.00	0.03
Scrapers	0.12	0.84	1.81	0.00	0.07
Skid Steer Loaders	0.01	0.21	0.16	0.00	0.01
Surfacing Equipment	0.03	0.42	0.52	0.00	0.02
Tractors/Loaders/Backhoes	0.03	0.36	0.31	0.00	0.02
Trenchers	0.05	0.44	0.41	0.00	0.03
Aerial Lifts	0.00	0.17	0.10	0.00	0.00
Forklifts	0.02	0.22	0.19	0.00	0.01

(1) Emission Factors from Off-Road 2011. CO emissions from SCAQMD, 2006: http://www.aqmd.gov/ceqa/handbook/offroad/offroadEF07_25.xls.

TABLE 3.2-15
Emission Estimates for Typical Construction Equipment
Assuming an 8-Hour Operational Day(1)

Equipment Type	VOC (lb/8-hr day)	CO (lb/8-hr day)	NOx (lb/8-hr day)	SOx (lb/8-hr day)	PM (lb/8-hr day)
Bore/Drill Rigs	0.28	4.01	4.55	0.02	0.16
Cranes	0.46	3.25	6.41	0.01	0.30
Excavators	0.22	4.13	2.82	0.01	0.12
Graders	0.54	4.65	7.44	0.01	0.33
Pavers	0.29	4.01	3.71	0.01	0.20
Paving Equipment	0.23	3.31	2.96	0.01	0.15
Rollers	0.22	3.11	2.13	0.01	0.13
Rough Terrain Forklifts	0.13	3.60	1.98	0.01	0.09
Rubber Tired Dozers	0.92	7.05	11.60	0.02	0.58
Rubber Tired Loaders	0.41	3.58	5.37	0.01	0.24
Scrapers	0.98	6.73	14.48	0.03	0.59
Skid Steer Loaders	0.09	1.72	1.27	0.00	0.06
Surfacing Equipment	0.25	3.35	4.17	0.01	0.16
Tractors/Loaders/Backhoes	0.20	2.92	2.45	0.01	0.15
Trenchers	0.36	3.49	3.25	0.01	0.22
Aerial Lifts	0.04	1.39	0.82	0.00	0.02
Forklifts	0.15	1.74	1.55	0.00	0.11

(1) See Table 3.2-13 for emission factors.

The 2017 Plan could result in the construction of various types of control equipment. Under SS1 - Fluid Catalytic Cracking in Refineries, it is assumed that three refineries would need to install wet gas scrubbers. SS7 – Sulfuric Acid Plants is expected to require wet gas scrubbers on up to three facilities. SS31 – General PM Emissions Limits is expected to require the construction of ESPs or baghouses at four BART car cleaning facilities. SS5 – Sulfur Recovery Units and SS6 - Refinery Fuel Gas may require the construction of wet gas scrubbers but the number of units that may be required is not known. S11 – Petroleum Refining Facility-Wide Emission Limits could require construction of various types of air pollution control equipment or refinery modification to comply with potential emission limits on refineries. SS20 – Revisions to Air Toxics Hotspots Program could require construction of air pollution control equipment or facility modifications on a number of facilities to comply with reduced risk requirements. SS22 – Stationary Gas Turbines is expected to require new SCR equipment on about six gas turbines. Finally, SS35 – PM from Coke, Coal Storage and Handling could require construction of structures to prevent wind-blown dust at bulk material handling facilities.

A range of construction scenarios for installing various types of control equipment were identified in order to estimate the magnitude of construction air quality impacts. The following subsections identify construction scenarios that may occur for several control technologies and are considered to be a representative range of construction activities and equipment from installing air pollution control technologies with minor construction required (few construction equipment or activities) to installation of air pollution control technologies requiring major construction (a large construction crew and a large number of construction equipment and activities).

Minor construction activities, such as installing new diesel ICEs. Diesel ICEs are often used to provide electricity at industrial facilities, used as a backup source of electricity in the event of a power outage, or as a means of pumping liquids between different refinery equipment. Over the past several decades, emission limits for diesel ICEs have been established and modified. Initial emission limits for ICEs were for engines referred to as Tier 1 ICEs. ICEs compliant with current emission limits are known as Tier 4 ICEs. Tier 4 ICEs are more efficient than Tier 1 ICEs and emit less pollutants. The use of Tier 4 ICEs would be one method to reduce TAC emissions from an industrial facility.

Construction emissions associated with installing new ICEs would be minor and would involve the transport of the new ICE to the facility and the removal of the existing ICE which is expected to require two truck trips. Installation of the ICEs would be expected to be limited to one to two workers and would not require any major equipment. Therefore, installation of new diesel ICEs would result in minor construction emissions.

Major construction activities, such as installing new Wet Gas Scrubbers. Evaluation of the various construction scenarios related to installing air pollution control equipment concluded that installing a WGS would require more demolition and construction equipment and activities than installing other types of control technologies and, therefore, would provide a "worst-case" analysis. Because of its large size, it is expected that installing a WGS (at a refinery FCCU, for example) would occur over a 17-month period; one month to demolish any nearby existing equipment or structures and 16 months to construct the WGS, which would include: site preparation, assembly and installation of the unit and ancillary support equipment, and tying-in the new WGS to the affected equipment. The analysis of the construction impacts associated with a WGS is based on an EIR prepared for the installation of a WGS on an FCCU in southern California (SCAQMD, 2007). These construction emission estimates are appropriate for use in the 2017 Plan because they are based on the estimated construction equipment associated with a permit application for the use of a WGS on a refinery FCCU. Regardless of the location of the construction activities, the amount of construction equipment would not be expected to substantially change because of the location. The estimated construction equipment that would be required for the installation of a refinery WGS during a peak month is provided in Table 3.2-16.

TABLE 3.2-16
Estimated Peak Day Off-Road Construction Emissions from the Installation of One Refinery Wet Gas Scrubber

Off- Road Equipment Type	Amount	Daily Hours of Use
Backhoe	1	10
Crane	2	10

Off- Road Equipment Type	Amount	Daily Hours of Use
Crane	1	10
Front End Loader	1	10
Man Lift	3	10
Forklift	2	10
Generator	1	10
Demolition Hammer	1	10
Welder	3	10

Source: SCAQMD, 2007

Control measure SS1 is expected to require the installation of WGS on FCCUs at three refineries and SS7 may require up to three WGS on sulfuric acid plants. In addition, WGS could be installed to comply with regulations that may be imposed on refineries and other industrial under SS5 – Sulfur Recovery Units, SS6 – Refinery Fuel Gas, SS11 – Petroleum Refining Facility-Wide Emission Limits, and SS20 – Air Toxics Risk Cap and Reduction from Existing Facilities.

Depending on the size and types of equipment or structures that may need to be demolished, a worst-case assumption is that up to 50 construction workers would be required. Demolition activities are assumed to require the use of one or more of the following equipment: crane, front-end loader, forklift, demolition hammer, water truck, and medium-duty flatbed truck. Other sources of demolition emissions could include haul truck trips to dispose of demolition debris, on-site travel (would include fugitive dust associated with travel on paved roads, and fugitive dust associated with demolition activities).

Because of its large size, construction of each WGS would likely require as many as 175 construction workers and, using worst-case assumptions, it is assumed that constructing a WGS would require the use of one or more of the following types of construction equipment: backhoes, cranes, man lifts, forklift, front end loaders generators, diesel welding machines, jack hammers, a medium-duty flatbed truck, a medium-duty dump truck, and a cement mixer. Other sources of construction emissions could include: equipment delivery, on-site travel (would include fugitive dust associated with travel on paved roads, and fugitive dust associated with construction activities).

The emission estimates for construction activities associated with a WGS are provided in Table 3.2-17. The 2017 Plan could result in the construction of five WGS at refineries and three at Sulfuric Acid Plants. Construction activities for installation WGS was estimated based on CEQA analyses completed for the installation of these facilities for other projects. The construction estimates associated with the construction of wet gas scrubbers is estimated to generate 45 - 72 tons of CO; 10 - 15 tons of ROG; 68 - 89 tons of NOx; less than 1 ton of SOx; 15 – 25 tons of PM10; and 8 - 14 tons of PM2.5. Construction emissions are temporary as construction emissions would cease following completion of construction activities.

TABLE 3.2-17
Estimated Construction Emissions for Wet Gas Scrubber[1]

ACTIVITY	CO	ROG	NOx	SOx	PM10	PM2.5
Construction Emissions from one WGS on Refinery Units[1] (lbs/day)						
Demolition for 1 WGS at Refinery[1]	36	6	28	<1	3	2
Construction Activities for 1 WGS at Refinery[1]	67	17	84	<1	39	23
Total Construction Estimates for one WGS on Refinery Units (tons emitted during construction period)						
Demolition for 1 WGS at Refinery[2]	0.36	0.06	0.28	<0.1	0.03	0.02
Construction Activities for 1 WGS at Refinery[3]	8.04	2.04	10.08	<0.1	4.68	2.76
Total Construction Emissions per each WGS[3]	8.4	2.1	10.4	<0.1	4.7	2.8
Construction Emissions for 3-5 Large WGS (tons) on Refinery Units (tons emitted during construction period)						
Construction[4]	25 - 42	6 - 11	31 - 52	<1	14 - 24	8 – 14
Construction Emissions from Installation of WGS at Sulfuric Acid Plant (lbs/day)[5]						
Demolition Activities at Sulfuric Acid Plants[5]	27	5	44	0	2	2
Construction Activities at Sulfuric Acid Plants[5]	49	12	68	0	4	4
Total Construction Estimates for WGS at Sulfuric Acid Plants (tons emitted during construction period)						
Demolition Activities at Sulfuric Acid Plants[6]	0.27	0.05	0.44	0	0.02	0.02
Construction Activities at Sulfuric Acid Plants[7]	6.2	1.26	11.76	0	0.42	0.42
Total WGS Estimated Construction Emissions at Sulfuric Acid Plants	6.5	1.3	12.2	0	0.44	0.44
Construction Emissions for WGS at 3 Sulfuric Acid Plants (tons emitted during construction period)						
Total Construction Activities[8]	19.5	3.9	36.6	0	1.32	0.44
Total Construction Emissions Construction of WGS Associated with 2017 Plan (tons emitted during construction period)						
Construction Emissions Associated with Installation of WGS	**45 - 72**	**10 - 15**	**68 - 89**	**<1**	**15 - 25**	**8 – 14**

(1) Reference: SCAQMD 2007, Final EIR for the ConocoPhillips Los Angeles Refinery – PM10 and NOx Reduction Projects which included the construction and operation of a WGS on a refinery FCCU.
(2) Demolition activities are estimated to occur for one month (20 working days)
(3) Construction activities are estimated to occur for a total of 16 months (20 working days per month), with 8 months at peak construction activities and 8 months at 50 percent of peak construction activities.
(4) Assumes construction of three to five large WGS on refinery units are required by the 2017 Plan.
(5) Reference: SCAQMD 2011, CEQA Evaluation for the Rhodia Inc. Wet Gas Scrubber/SOx RECLAIM Project http://www.aqmd.gov/docs/default-source/ceqa/documents/permit-projects/2011/ceqa-evaluation-of-the-rhodia-inc-wet-gas-scrubber-sox-reclaim-project.pdf?sfvrsn=6
(6) Demolition activities are estimated to occur for one month (20 working days)
(7) Construction activities are estimated to occur for a total of 15 months (20 working days per month), with 7 months at peak construction activities and 8 months at 50 percent of peak construction activities.
(8) Assumes construction of three WGS on Sulfuric Acid Plants is required by the 2017 Plan.

Medium construction activities, such as installing other types of air pollution control equipment. Other control measures could require the installation of air pollution control equipment. SS31 – General PM Emissions Limits is expected to require the construction of ESPs or baghouses at four BART car cleaning facilities. SS22 – Stationary Gas Turbines is expected to require new SCR equipment on about six gas turbines.

In a recent CEQA document, the SCAQMD estimated the construction emissions associated with installing air pollution control equipment at non-refinery facilities (SCAQMD, 2015). These data are expected to be appropriate for use in the 2017 Plan because the estimated construction equipment would be expected to be the same regardless of the location and are summarized in Table 3.2-18.

TABLE 3.2-18
Construction Equipment Estimated for Installation of Air Pollution Control Equipment[(1)]

Construction Phase	Off- Road Equipment Type	Amount	Daily Hours of Use
Building Construction	Cranes	1	6
Building Construction	Forklifts	1	6
Building Construction	Generator Sets	1	8
Building Construction	Tractors/Loaders/Backhoes	1	6
Building Construction	Welders	2	8
Building Construction	Aerial Lifts	1	8
Demolition	Concrete/Industrial Saws	1	8
Demolition	Rubber Tired Dozers	1	8
Demolition	Tractors/Loaders/Backhoes	1	8
Demolition	Cranes	1	8
Paving	Cement and Mortar Mixers	1	6
Paving	Paving Equipment	1	8
Paving	Plate Compactors	1	6
Paving	Tractors/Loaders/Backhoes	1	8
Site Preparation	Rubber Tired Dozers	1	7
Site Preparation	Tractors/Loaders/Backhoes	1	8
Site Preparation	Trenchers	1	8

(1) Source: SCAQMD, 2015

TABLE 3.2-19
Construction Emissions for General Air Pollution Control Equipment[(1)]

Construction Emissions	CO	ROG	NOx	SOx	PM10	PM2.5
Peak Daily Construction Emissions for one facility (lbs/day)[(1)]	3.7	31.7	21.7	0.03	7.1	4.1
Total Construction Emissions for one facility (lbs/day)[(2)]	444	3,804	2,604	3.6	852	492
Total Construction Emissions for one facility (tons)	0.22	1.9	1.3	<0.01	0.43	0.25
Total Construction Emissions for ten facilities (tons)[(3)]	**2.22**	**19**	**13**	**<0.01**	**4.3**	**2.5**
DPF[(4)] (tons)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Enclosures[(4)] (tons)	5.0	0.6	6.3	<0.1	0.6	0.4
Oxidizers[(4)] (tons)	0.3	<0.1	0.4	<0.1	0.1	<0.1

(1) Reference: SCAQMD 2015, Program Environmental Assessment for Proposed Amended Regulation XX – Regional Clean Air Incentives Market.
(2) Construction activities are estimated to occur for a total of 6 months (20 working days per month),
(3) Assumes the 2017 Plan will require control equipment on at least 10 (non-refinery) facilities.
(4) DPF assumes 7 projects per year and 3 days of construction activities per project. Enclosures assume 3 projects per year and 239 days of construction activities per project. Oxidizers assume 80 per year and 21 days of construction activity per project.

Table 3.2-19 provides the estimated construction emissions associated with the installation of medium-sized control equipment (e.g., SCRs and ESPs) at one facility.

In addition, other control measures may also require construction activities. SS20 – Air Toxics Risk Cap and Reduction from Existing Facilities could require construction of air pollution control equipment or facility modifications on a number of facilities to comply with reduced risk requirements. SS35 – PM from Bulk Materials, including Coke and Coal could also result in the construction of structures to enclose storage piles. The number of facilities that could potentially be affected by these control measures is not currently known. A reasonable estimate of construction activities associated with implementation of SS20 and SS35 would be the emission estimates for the medium-sized construction activities outlined in Table 3.2-19.

In addition, a Negative Declaration was prepared for Rule 2-5 New Source Review for Toxic Air Contaminants (SS21) which estimated the construction emissions associated with installation of diesel particulate filters, enclosures and oxidizers to be as follows: 1.92 lbs/day VOC, 16.81 lbs/day CO, 20.01 lbs/day NOx, 0.05 lbs/day SOx, 1.98 lbs/day PM10, and 1.45 lb/day PM2.5. These emissions have been converted into tons per day and included in Table 3.2-19.

In addition, SS3 – Cooling Towers (Rule 11-10) and SS19 – Portland Cement (Rule 9-13) were recently approved by the Air District as modifications to existing rules. No construction activities were associated with the implementation of either rule.

Summary of Construction Emission Impacts

Table 3.2-20 summarizes the potential construction impacts associated with implementation of the 2017 Plan for those control measures where sufficient information is available to estimate construction emissions. The total construction estimates associated with the 2017 Plan is: 47 - 74 tons of CO; 29 - 34 tons of ROG; 81 - 102 tons of NOx; less than 1 ton of SOx; 19 – 29 tons of PM10; and 11 – 17 tons of PM2.5. As noted above, construction emissions are temporary as construction emissions would cease following completion of construction activities.

TABLE 3.2-20
Construction Emissions Summary (tons)

Construction Emissions	CO	ROG	NOx	SOx	PM10	PM2.5
Construction Emissions Associated with Installation of WGS(1)	45 - 72	10 - 15	68 - 89	<1	15 - 25	8 – 14
Construction Emissions for 10 Non-Refinery Facilities (tons)(2)	2.22	19	13	<0.01	4.3	2.5
DPF, Enclosures, Oxidizers(2)	5.4	0.8	6.8	<0.1	0.8	0.6
Total Estimate Construction Emissions	**50 - 77**	**30 – 35**	**88 – 109**	**<1**	**20 - 30**	**11 - 17**

(1) See Table 3.2-17
(2) See Table 3.2-19

3.2.6 CUMULATIVE AIR QUALITY IMPACTS

In addition to evaluating whether any action the District may take in implementing the proposed 2017 Plan will cause significant air quality impacts by itself, the EIR must also evaluate whether any District action may contribute to significant cumulative air quality impacts caused by other existing and reasonably foreseeable future activities. Specifically, CEQA Guidelines Section 15064(h) requires an evaluation of whether the District's implementation of the proposed 2017 Plan will result in any "cumulatively considerable" contribution to an existing (or reasonably foreseeable future) significant air quality impact. The geographical location for the cumulative air quality impacts is the jurisdictional boundaries of the Air District, which includes all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties, and portions of southwestern Solano and southern Sonoma counties.

As described in Section 3.2.2.1, air quality within the Bay Area has improved since 1955 when the Air District was created and is projected to continue to improve. This improvement is mainly due to lower-polluting on-road motor vehicles, more stringent regulation of industrial sources, and the implementation of emission reduction strategies by the Air District. This trend towards cleaner air has occurred in spite of continued population growth. Ambient concentrations of air pollutants and the number of days on which the region exceeds air quality standards have been reduced, although increases in the number of days that the standards have been exceeded increased in 2014 and 2015 (see Table 3.2-3). The Air District is in attainment of the State and federal ambient air quality standards for CO, nitrogen oxides (NOx), and sulfur oxides (SOx).

However, the Bay Area is designated as a non-attainment area for the federal and state 8-hour ozone standard. The State 8-hour standard was exceeded on 12 days in 2015 in the Air District, most frequently in the Eastern District (Livermore, Patterson Pass, and San Ramon) (see Table 3.2-2). The federal 8-hour standard was exceeded on 12 days in 2015. The Air District is unclassified for the federal 24-hour PM10 standard and is non-attainment with the State 24-hour PM10 standard. Since the District is not in attainment for the federal and state ozone standard, the state 24-hour PM10 standard, and the federal 24-hour PM2.5 standard, past projects and activities have contributed to the nonattainment air quality impacts that are cumulatively significant.

The 2017 Plan is expected to result in overall reductions in VOC, NOx, SOx, and PM emissions, providing an air quality benefit. As shown in Table 3.2-8, large emission reductions are expected from implementation of the 2017 Plan which are expected to help the Bay Area come into compliance or attainment with the federal and state 8-hour ozone standard, the federal and state PM10 standards, the federal 24-hour PM2.5 standards, and the state 24-hour PM2.5 standard, providing both air quality and public health benefits. The proposed project is not expected to result in a cumulatively considerable contribution to the existing significant cumulative air quality impacts occurring within the Bay Area. As shown in Table 3.2-21, emission reductions from the 2017 Plan are expected to far outweigh any potential secondary emission increases associated with the 2017 Plan, providing a beneficial impact on air quality and public health.

3.2.7 CONCLUSIONS

Table 3.2-21 provides a summary of the estimated secondary emission increases and estimated decreases in emissions associated with the 2017 Plan, and particularly the measures listed in Table 3.2-8. As shown below, the emission reductions are expected to far outweigh any potential secondary emission increases, providing a beneficial impact on air quality. It should be noted that the construction activities would occur on a one-time basis and then would cease, so that actual net air emission reductions are expected to be greater than shown.

TABLE 3.2-21
Air Quality Emissions Summary (tons/year)

	ROG	**NOx**	**SOx**	**PM2.5**
Total Estimate Construction Emissions(1)	30-35	88-109	<1	11 - 17
Indirect Emissions from Electricity	4.5	252.3	165.8	45.7
Air Quality Impacts Associated with Transportation Activities(2)	1.13	3.30	0.02	1.09
Emissions from Oxidizers(3)	2.3	12.8	0.2	2.5
Total Emission Increases	**38-43**	**356-377**	**167**	**60-66**
Estimated Emission Reductions	**1,596**	**2,993**	**2,590**	**506**

(1) See Table 3.2-20
(2) See Table 3.2-10
(3) See Table 3.2-12

CHAPTER 3.3 GREENHOUSE GAS EMISSIONS

3.3 GREENHOUSE GAS EMISSIONS

3.3.1 INTRODUCTION

Global climate change refers to changes in average climatic conditions on the earth as a whole, including temperature, wind patterns, precipitation and storms. Global warming, a related concept, is the observed increase in the average temperature of the earth's surface and atmosphere. One identified cause of global warming is an increase of greenhouse gases (GHGs) in the atmosphere. The six major GHGs identified by the Kyoto Protocol are CO_2, methane (CH_4), nitrous oxide (N_2O), sulfur hexafluoride (SF_6), hydrofluorocarbons (HFCs), and perfluorocarbons (PFCs). Although not included among the Kyoto Six GHGs, black carbon, a key component of fine PM, has been identified as a potent agent of climate change. Black carbon is the third largest GHG in the Bay Area on a carbon dioxide equivalence (CO_2e) basis. Diesel engines and wood-burning are key sources of black carbon in the Bay Area.

The GHGs absorb longwave radiant energy reflected by the earth, which warms the atmosphere. GHGs also radiate longwave radiation both upward to space and back down toward the surface of the earth. The downward part of this longwave radiation absorbed by the atmosphere is known as the "greenhouse effect."

While the cumulative impact of GHG emissions is global, the geographic scope of this cumulative impact analysis is the State of California. The analysis of GHG emissions is a different analysis than for criteria pollutants for the following reasons. For criteria pollutants, significance thresholds are based on daily emissions because attainment or non-attainment is typically based on daily exceedances of applicable ambient air quality standards. Further, the ambient air quality standards for criteria pollutants are based on relatively short-term exposure effects to human health, e.g., one-hour and eight-hour. Using the half-life of CO_2, 100 years, for example, the effects of GHGs are longer-term, affecting the global climate over a relatively long time frame.

It is the increased accumulation of GHGs in the atmosphere that may result in global climate change. Climate change involves complex interactions and changing likelihoods of diverse impacts. Due to the complexity of conditions and interactions affecting global climate change, it is not possible to predict the specific impact, if any, attributable to GHG emissions associated with a single project, which is why GHG emission impacts are considered to be a cumulative impact.

Emissions of GHGs, especially combustion of fossil fuels for energy, transportation, and manufacturing, contribute to warming of the atmosphere that may cause rapid changes in the way a number different types of ecosystems typically function. For example, in some regions, changing precipitation or acceleration of melting snow and ice are altering hydrological systems, affecting water resources in terms of quantity and quality. Melting glaciers and polar ice sheets are expected to contribute to sea level rise. Rising sea levels are expected to contribute to an increase in coastal flooding events.

A warmer atmosphere could also contribute to chemical reactions increasing the formation of ground-level ozone. Ozone is a well-known lung irritant and a major trigger of respiratory problems like asthma attacks. Local changes in temperature and rainfall could alter the distribution of some waterborne illnesses and disease vectors. For example, warmer freshwater makes it easier for pathogens to grow and contaminate drinking water.

Potential health effects from global climate change may arise from temperature increases, climate-sensitive diseases, extreme events, and air quality. There may be direct temperature effects through increases in average temperature leading to more extreme heat waves and less extreme cold spells. Those living in warmer climates are likely to experience more stress and heat-related problems (i.e., heat rash and heat stroke). In addition, climate sensitive diseases may increase, such as those spread by mosquitoes and other disease carrying insects. Those diseases include malaria, dengue fever, yellow fever, and encephalitis. Extreme events such as flooding and hurricanes can displace people and agriculture, which would have negative consequences. Drought in some areas may increase, which would decrease water and food availability. Global climate change may also exacerbate air quality problems from increased frequency of exceeding criteria pollutant ambient air quality standards.

This chapter analyzes how implementation of the 2017 Plan may contribute to global climate change through GHG emissions.

3.3.2 ENVIRONMENTAL SETTING

There are dozens of GHGs, but a subset of these gases are the primary agents of climate change. The six major GHGs identified by the Kyoto Protocol plus black carbon are the GHGs considered in the 2017 Plan.

Carbon Dioxide (CO_2) is released to the atmosphere when fossil fuels (oil, gasoline, diesel, natural gas, and coal), solid waste, and wood or wood products are burned.

Methane (CH_4) is emitted during the production and transport of coal, natural gas, and oil. Methane emissions also result from the decomposition of organic waste in municipal solid waste landfills and the raising of livestock.

Nitrous oxide (N_2O) is emitted during agricultural and industrial activities, as well as during combustion of solid waste and fossil fuels.

Hydrofluorocarbons (HFCs), **perfluorocarbons** (PFCs), and **sulfur hexafluoride** (SF_6), are generated by a variety of industrial processes. Emissions of these fluorinated gases (F-gases) are small on a mass basis, but they are potent agents of climate change on a per unit basis.

Black Carbon: Although not included among the Kyoto Six GHGs, black carbon is a key component of fine particulate matter and has been identified as a potent agent of climate change. Black carbon is the third largest GHG in the Bay Area on a CO_2-equivalent basis. Diesel engines and wood-burning are key sources of black carbon in the Bay Area. Since exposure to fine PM has a wide range of health impacts, reducing emissions of black carbon will provide important public health co-benefits.

Table 3.3-1 shows atmospheric lifespan, 20-year and 100-year GWP values, and key emission sources for the GHGs addressed in the 2016 Plan.

TABLE 3.3-1
Greenhouse Gases Addressed in the 2016 Plan

Greenhouse Gas	Atmospheric Lifespan	GWP * (20-year timeframe)	GWP * (100-year timeframe)	Key Emissions Sources
Carbon dioxide (CO_2)	20-200 years	1	1	Fossil fuel combustion
Nitrous oxide (N_2O)	114 years	268	298	Motor vehicles, agriculture, water treatment, composting
Methane (CH_4)	12 years	86	34	Natural gas production & distribution, solid waste disposal, ranching, dairies
Hydrofluorocarbons (HFCs)	1.5 to 264 years	506 to 6,940	138 to 8,060	Refrigeration, air conditioning
Perfluorocarbons (PFCs)	3,000 years or more	6,500	6,500	Semiconductor manufacturing
Sulfur Hexafluoride (SF_6)	3,200 years	17,500	23,500	Electricity grid losses
Black Carbon**	Days to weeks	3,235	900	Diesel engines, wood-burning

* The GWP values in Table 3.3-1 are taken from the IPCC 5th Assessment Report (AR5), with the exception of black carbon.
** The black carbon values are based on from US EPA report on black carbon:
https://www3.epa.gov/blackcarbon/2012report/Chapter2.pdf

An emissions inventory is a detailed estimate of the amount of air pollutants discharged into the atmosphere of a given area by various emission sources during a specific time period. The emission inventory in Table 3.3-2 focuses GHG emissions due to human activities in the State of California. In 2014, total GHG emissions were 441.5 million metric tons of CO_2 equivalent ($MMTCO_2e$), a decrease of 3.51 $MMTCO_2e$ compared to 2010.

TABLE 3.3-2
California Greenhouse Gas Emission and Sinks Summary
(million metric tons CO_2e)

Categories Included in the Inventory	2004	2010	2014
ENERGY	**427.53**	**378.67**	**367.71**
Fuel Combustion Activities	**420.08**	**370.95**	**359.87**
Energy Industries	172.76	144.85	139.95
Manufacturing Industries & Construction	19.52	18.72	20.28
Transport	181.43	161.84	158.62
Other Sectors	46.37	45.55	41.02
Fugitive Emissions from Fuels	**7.45**	**7.72**	**7.84**
Solid Fuels	0.04	0.02	0.02
Oil and Natural Gas	6.18	6.53	6.89
Geothermal Energy Production	1.12	1.10	0.92
Pollution Control Devices	0.11	0.06	0.00
INDUSTRIAL PROCESSES & PRODUCT USE	**19.81**	**22.40**	**30.24**
Mineral Industry	6.11	3.49	5.32
Chemical Industry	0.05	0.05	0.01
Metal Industry	0.07	0.07	0.06
Non-Energy Products from Fuels & Solvent Use	2.65	2.47	2.38
Electronics Industry	0.35	0.20	0.26
Product Uses as Substitutes for Ozone Depleting Substances	6.37	11.93	16.76
Other Product Manufacture & Use Other	0.90	0.82	0.72
Other	3.31	3.36	4.73
AGRICULTURE, FORESTRY, & OTHER LAND USE	**30.62**	**33.51**	**32.85**
Livestock	20.81	24.00	23.81
Aggregate Sources & Non-CO_2 Emissions Sources on Land	9.80	9.51	9.04
WASTE	**9.67**	**10.48**	**10.73**
Solid Waste Disposal	7.42	8.11	8.28
Biological Treatment of Solid Waste	0.33	0.47	0.57
Wastewater Treatment & Discharge	1.92	1.90	1.88
Included California Emissions	**487.63**	**445.05**	**441.54**

Source: 2016 Edition California GHG Inventory for 2000-2014 by IPCC (CARB, 2016)

Table 3.3-3 presents the GHG emission inventory by major source categories in calendar year 2015, as identified in the 2017 Plan for the District. Transportation sources generate approximately 40 percent of the total GHG emissions in the District. The remaining 60 percent of the total District GHG emissions are from stationary and area sources.

TABLE 3.3-3
2015 BAAQMD Greenhouse Gas Emission Inventory
(metric tons of CO_2e)

Source Category	CO_2, CH_4, N_2O, HFC/PFC, SF6	Black Carbon	Total Emissions (CO_2e)
Transportation	**35,040,000**	**770,000**	**35,810,000**
On-road	30,480,000	310,000	30,790,000
Off-road	4,560,000	460,000	5,020,000
Electricity/Co-Generation	**15,790,000**	**130,000**	**15,920,000**
Co-Generation	6,790,000	90,000	6,880,000
Electricit Generation	6,210,000	40,000	6,250,000
Electricity Imports	2,790,000	-	2,790,000
Buildings	**9,870,000**	**400,000**	**10,270,000**
Residential Fuel Usage	6,460,000	220,000	6,680,000
Commercial Fuel Usage	3,410,000	180,000	3,590,000
Stationary Sources	**20,840,000**	**340,000**	**21,180,000**
Oil Refineries	14,240,000	210,000	14,450,000
General Fuel Usage	5,880,000	130,000	6,010,000
Fugitive/Process Emissions	720,000	4,000	724,000
Waste Management	**2,480,000**	**23,000**	**2,503,000**
Landfills	2,050,000	22,000	2,072,000
Composting/POTWs	430,000	1,000	431,000
High-GWP Gases	**2,790,000**	**-**	**2,790,000**
HFCs and PFCs	2,740,000	-	2,740,000
SF6	50,000	-	50,000
Agriculture	**1,180,000**	**170,000**	**1,350,000**
Agricultrual Equipment	180,000	43,000	223,000
Animal Waste	720,000	16,000	736,000
Soil Management	270,000	1,000	271,000
Biomass Burning	10,000	110,000	120,000
Total Emissions	**87,990,000**	**1,833,000**	**89,823,000**

Source: BAAQMD, 2016

The emission inventory in Table 3.3-3 focuses on GHG emissions projections due to human activities only, and compiles emission estimates that result from industrial, commercial, transportation, domestic, forestry, and agriculture activities in the San Francisco Bay Area region of California. The GHG emission inventory reports direct emissions generated from sources within the District. The report does not include indirect emissions, for example, a source using electricity has no direct emissions because emissions are emitted at the power plants. Emissions of CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6 are estimated using the most current activity and emission factor data from various sources. Emission factor data was obtained from the U.S. Department of Energy's (DOE's) Energy Information Administration (EIA), the CEC, and ARB.

Under "business as usual" conditions, GHG emissions are expected to grow in the future due to population growth and economic expansion, absent any further policy inberventions. Table 3.3-4 shows emissions trends by major sources for the period 1990 to 2020.

TABLE 3.3-4
Bay Area Emission Trends by Major Sources
(Million metric Tons CO_2e)

Category	1990	2008	2011	2014	2017	2020
Transportation	28.6	34.8	34.3	33.9	32.5	30.4
Industry/Commercial	21	28.9	31	32.6	34.3	36
Electricity/Co-Gen.	8.4	13.9	12.1	12.9	12.6	12.3
Residential Fuel	7	6.5	6.6	6.7	6.8	6.9
Off-Road Equipment	0.9	1.4	1.3	1.3	1.4	1.3
Agriculture	1.2	1.3	1.3	1.3	1.3	1.3
Total	67.1	86.8	86.6	88.7	88.8	88.2

Source: Bay Area Emission Inventory Summary Report: Greenhouse Gases. (BAAQMD, 2015)

Greenhouse gas emissions are projected based on estimated growth in various source categories. For example, ARB's EMFAC2011 and OFFROAD2007 computer models were utilized to project GHG emissions from transportation sources. In these models, fuel consumption estimates were based on the anticipated change of fleet mix and the growth of various types of on-road and off-road vehicles. Growth in VMT is based on the MTC's Regional Transportation Plan (RTP2030). For aircraft categories, the fleet mix, activity, and growth data are based on information from the Bay Area airports in combination with the MTC's Regional Airport System Planning Analysis: 2011 Update and the Federal Aviation Administration's (FAA's) 2010 Terminal Area Forecast reports. (BAAQMD, 2015).

The GHG projections from other major sources such as landfills, natural gas fuel distribution, and cement manufacturing were estimated by using 2009 Association of Bay Area Government's employment and population data. California Integrated Waste Management data were also considered in the landfill projection process. This GHG emission inventory will be updated as additional information about activity data, emission factors and other inputs becomes available (BAAQMD, 2006).

3.3.3 REGULATORY SETTING

3.3.3.1 Federal Regulations

Greenhouse Gas Endangerment Findings: On December 7, 2009, the U.S. EPA Administrator signed two distinct findings regarding greenhouse gases under section 202(a) of the CAA. The Endangerment Finding stated that CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6 taken in combination endanger both the public health and the public welfare of current and future generations. The Cause or Contribute Finding stated that the combined emissions from motor vehicles and motor vehicle engines contribute to the greenhouse gas air pollution that endangers public health and welfare. These findings were a prerequisite for implementing GHG standards for vehicles. The U.S. EPA and the National Highway Traffic Safety Administration (NHTSA) finalized emission standards for light-duty vehicles in May 2010 and for heavy-duty vehicles in August of 2011.

Renewable Fuel Standard: The RFS program was established under the Energy Policy Act (EPAct) of 2005, and required 7.5 billion gallons of renewable-fuel to be blended into gasoline by 2012. Under the Energy Independence and Security Act (EISA) of 2007, the RFS program was expanded to include diesel, required the volume of renewable fuel blended into transportation fuel be increased from nine billion gallons in 2008 to 36 billion gallons by 2022, established new categories of renewable fuel and required the U.S. EPA to apply lifecycle GHG performance threshold standards so that each category of renewable fuel emits fewer greenhouse gases than the petroleum fuel it replaces. The RFS is expected to reduce greenhouse gas emissions by 138 million metric tons, about the annual emissions of 27 million passenger vehicles, replacing about seven percent of expected annual diesel consumption and decreasing oil imports by $41.5 billion.

GHG Tailoring Rule: On May 13, 2010, U.S. EPA finalized the Tailoring Rule to phase in the applicability of the Prevention of Significant Deterioration (PSD) and Title V operating permit programs for GHGs. The rule was tailored to include the largest GHG emitters, while excluding smaller sources (restaurants, commercial facilities and small farms). The first step (January 2, 2011 to June 30, 2011) addressed the largest sources that contributed 65 percent of the stationary GHG sources. Title V GHG requirements were triggered only when affected facility owners/operators were applying, renewing or revising their permits for non-GHG pollutants. PSD GHG requirements were applicable only if sources were undergoing permitting actions for other non-GHG pollutants and the permitted action would increase GHG emission by 75,000 metric tons of CO_2e per year or more.

On June 23, 2014, the U.S. Supreme Court issued its decision in Utility Air Regulatory Group v. EPA, 134 S.Ct. 2427 (2014). The Court held that U.S. EPA may not treat GHGs as an air pollutant for purposes of determining whether a source is a major source required to obtain a PSD or Title V permit. The Court also held that PSD permits that are otherwise required to be subject to PSD (based on emissions of other pollutants) may continue to require limitations on GHG emissions based on the application of BACT. In accordance with the Supreme Court decision, on April 10, 2015, the D.C. Circuit issued an amended judgment in Coalition for Responsible Regulation, Inc. v. Environmental Protection Agency, Nos. 09-1322, 10-073, 10-1092 and 10-1167 (D.C. Cir. April 10, 2015), which, among other things, vacated the PSD and Title V regulations under review in that case to the extent that they require a stationary source to obtain a PSD or Title V permit solely because the source emits or has the potential to emit GHGs above the applicable major source thresholds.

GHG Reporting Program: U.S. EPA issued the Mandatory Reporting of Greenhouse Gases Rule (40 CFR Part 98) under the 2008 Consolidated Appropriations Act. The Mandatory Reporting of Greenhouse Gases Rule requires reporting of GHG data from large sources and suppliers under the Greenhouse Gas Reporting Program. Suppliers of certain products that would result in GHG emissions if released, combusted or oxidized; direct emitting source categories; and facilities that inject CO_2 underground for geologic sequestration or any purpose other than geologic sequestration are included. Facilities that emit 25,000 metric tons or more per year of GHGs in CO_2e are required to submit annual reports to U.S. EPA. For the 2014 calendar year, there were over 8,000 entities that reported 3.20 billion metric tons of GHG emissions under this program. CO_2 emissions accounted for the largest share of direct emissions with 91.5 percent, followed by methane with seven percent, and nitrous oxide and fluorinated gases representing the remaining 1.5 percent (U.S. EPA, 2016a).

National Program to Improve Fuel Economy: On September 15, 2009, the NHTSA and U.S. EPA announced a proposed joint rule that would explicitly tie fuel economy to GHG emissions reductions requirements. The proposed new corporate average fuel economy (CAFÉ) Standards would cover automobiles for model years 2012 through 2016, and would require passenger cars and light trucks to meet a combined, per mile, carbon dioxide emissions level. It was estimated that by 2016, this GHG emissions limit could equate to an overall light-duty vehicle fleet average fuel economy of as much as 35.5 miles per gallon. The proposed standards required model year 2016 vehicles to meet an estimated combined average emission level of 250 grams of carbon dioxide per mile under EPA's GHG program. On November 16, 2011, EPA and NHTSA issued a joint proposal to extend the national program of harmonized GHG and fuel economy standards to model year 2017 through 2025 passenger vehicles. In August 2012, the President of the United States finalized standards that will increase fuel economy to the equivalent of 54.5 mpg for cars and light-duty trucks by Model Year 2025.

Clean Power Plan: On August 3, 2015, the President of the United States and the U.S. EPA announced the Clean Power Plan. The Clean Power Plan sets achievable standards to reduce carbon dioxide emissions by 32 percent from 2005 levels by 2030. This Plan establishes final emissions guidelines for states to follow in developing plans to reduce GHG emissions from existing fossil fuel-fired electric generating units (EGUs). Specifically, the U.S. EPA established: (1) carbon dioxide emission performance rates representing the best system of emission reduction (BSER) for two subcategories of existing fossil fuel-fired EGUs, fossil fuel-fired electric utility steam generating units and stationary combustion turbines; (2) state-specific carbon dioxide goals reflecting the carbon dioxide emission performance rates; and (3) guidelines for the development, submittal and implementation of state plans that establish emission standards or other measures to implement the carbon dioxide emission performance rates, which may be accomplished by meeting the state goals. This final rule will continue progress already under way in the U.S. to reduce carbon dioxide emissions from the utility power sector. In February 2016, the U.S. Supreme Court issued a stay of this rule pending final determination on litigation challenging the rule.

Planning for Federal Sustainability in the Next Decade: Published June 10, 2015, Executive Order 13693, *Planning for Federal Sustainability in the Next Decade*, revokes multiple prior Executive Orders and memorandum. The Executive Order outlines goals for federal agencies in the area of energy, climate change, water use, vehicle fleets, construction, and acquisition. The goal is to maintain federal leadership in sustainability and GHG emission reductions. Federal agencies shall, where life-cycle cost-effective, beginning in fiscal year 2016:

- Reduce agency building energy intensity as measured in Btu/ft2 by 2.5 percent annually through 2025.
- Improve data center energy efficiency at agency buildings.
- Ensure a minimum percentage of total building electric and thermal energy shall be from clean energy sources.
- Improve agency water use efficiency and management (including stormwater management).
- Improve agency fleet and vehicle efficiency and management by achieving minimum percentage GHG emission reductions.

3.3.3.2 State Regulations

Executive Order S-3-05: In June 2005, then Governor Schwarzenegger signed Executive Order S-3-05, which established GHG emission reduction targets. The goals would reduce GHG emissions to 2000 levels by 2010, then to 1990 levels by 2020, and to 80 percent below 1990 levels by 2050.

AB 32: Global Warming Solutions Act: On September 27, 2006, AB 32, the California Global Warming Solutions Act of 2006, was enacted by the State of California and signed by Governor Schwarzenegger. AB 32 expanded on Executive Order S-3-05. The legislature stated that "global warming poses a serious threat to the economic well-being, public health, natural resources, and the environment of California." AB 32 established a program to limit GHG emissions from major industries that includes penalties for non-compliance. While acknowledging that national and international actions will be necessary to fully address the issue of global warming, AB 32 lays out a program to inventory and reduce GHG emissions in California and from power generating facilities located outside the state that serve California residents and businesses.

Authorized by AB 32, the cap-and-trade program is one of several strategies that California uses to reduce greenhouse gas emissions. ARB adopted the California cap-and-trade program final regulations on October 20, 2011, and adopted amended regulations on September 12, 2012, with the first auction for GHG allowances on November 14, 2012. Funds received from the program are deposited into the Greenhouse Gas Reduction Fund and appropriated by the Legislature. It sets a GHG emissions limit that will decrease by two percent each year until 2015, and then three percent from 2015 to 2020 to achieve the goals in AB 32. The program initially applies to large electric power plants and large industrial plants, and included fuel distributors in 2015. These rules encompass 85 percent of all of California's GHG emissions.

SB 97 - CEQA: Greenhouse Gas Emissions: On August 24, 2007, Governor Schwarzenegger signed into law Senate Bill (SB) 97 – CEQA: Greenhouse Gas Emissions stating, "This bill advances a coordinated policy for reducing greenhouse gas emissions by directing the Office of Planning and Research (OPR) and the Resources Agency to develop CEQA guidelines on how state and local agencies should analyze, and when necessary, mitigate greenhouse gas emissions." OPR's amendments provided guidance to public agencies regarding the analysis and mitigation of the effects of GHG emissions in draft CEQA documents. The amendments did not establish a threshold for significance for GHG emissions. The amendments became effective on March 18, 2010.

Office of Planning and Research Technical Advisory on CEQA and Climate Change: Consistent with SB 97, on June 19, 2008, OPR released its "Technical Advisory on CEQA and Climate Change," which was developed in cooperation with the Resources Agency, the Cal/EPA, and the ARB. According to OPR, the "Technical Advisory" offers the informal interim guidance regarding the steps lead agencies should take to address climate change in their CEQA documents, until CEQA guidelines are developed pursuant to SB 97 on how state and local agencies should analyze, and when necessary, mitigate greenhouse gas emissions.

According to OPR, lead agencies should determine whether greenhouse gases may be generated by a proposed project, and if so, quantify or estimate the GHG emissions by type and source. Second, the lead agency must assess whether those emissions are individually or cumulatively significant. When assessing whether a project's effects on climate change are "cumulatively considerable" even though the GHG contribution of the project may be individually limited, the lead agency must consider the impact of the project when viewed in connection with the effects of past, current, and probable future projects. Finally, if the lead agency determines that the GHG emissions from the project as proposed are potentially significant, it must investigate and implement ways to avoid, reduce, or otherwise mitigate the impacts of those emissions.

AB 1493 Vehicular Emissions: Carbon Dioxide: Prior to the U.S. EPA and NHTSA joint rulemaking, the Governor signed AB 1493 (2002). AB 1493 requires that ARB develop and adopt, by January 1, 2005, regulations that achieve "the maximum feasible reduction of greenhouse gases emitted by passenger vehicles and light-duty trucks and other vehicles determined by ARB to be vehicles whose primary use is noncommercial personal transportation in the state."

ARB originally approved regulations to reduce GHGs from passenger vehicles in September 2004, with the regulations that apply to 2009 and later model year vehicles. California's first request to the U.S. EPA to implement GHG standards for passenger vehicles was made in December 2005 and denied in March 2008. The U.S. EPA then granted California the authority to implement GHG emission reduction standards for new passenger cars, pickup trucks and sport utility vehicles on June 30, 2009.

On April 1, 2010, the ARB filed amended regulations for passenger vehicles as part of California's commitment toward the National Program to reduce new passenger vehicle GHGs from 2012 through 2016. The amendments will prepare California to harmonize its rules with the federal Light-Duty Vehicle GHG Standards and CAFÉ Standards (discussed above).

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

Executive Order S-1-07 (2007): Governor Schwarzenegger signed Executive Order S-1-07 in 2007 which finds that the transportation sector is the main source of GHG emissions in California. The executive order proclaims the transportation sector accounts for over 40 percent of statewide GHG emissions. The executive order also establishes a goal to reduce the carbon intensity of transportation fuels sold in California by a minimum of 10 percent by 2020.

In particular, the executive order established a Low-Carbon Fuel Standard (LCFS) and directed the Secretary for Environmental Protection to coordinate the actions of the CEC, the ARB, the University of California, and other agencies to develop and propose protocols for measuring the "life-cycle carbon intensity" of transportation fuels. This analysis supporting development of the protocols was included in the State Implementation Plan for alternative fuels (State Alternative Fuels Plan adopted by CEC on December 24, 2007) and was submitted to ARB for consideration as an "early action" item under AB 32. ARB adopted the LCFS on April 23, 2009.

Senate Bill 375 (2008): SB 375, signed in September 2008, aligns regional transportation planning efforts, regional GHG reduction targets, and land use and housing allocation. SB 375 requires Metropolitan Planning Organizations (MPOs) to adopt a Sustainable Communities Strategy (SCS) or Alternative Planning Strategy (APS) which prescribes land use allocation in that MPO's Regional Transportation Plan (RTP). ARB, in consultation with MPOs, is required to provide each affected region with reduction targets for GHGs emitted by passenger cars and light trucks in the region for the years 2020 and 2035. These reduction targets will be updated every eight years but can be updated every four years if advancements in emissions technologies affect the reduction strategies to achieve the targets. ARB is also charged with reviewing each MPO's SCS or APS for consistency with its assigned GHG emission reduction targets. ARB set the following reduction targets for ABAG/MTC region: reduce per capita seven percent of GHG emissions below 2005 levels by 2020 and 15 percent below 2005 levels by 2035.

Executive Order S-13-08 (2008): Governor Schwarzenegger signed Executive Order S-13-08 on November 14, 2008 which directs California to develop methods for adapting to climate change through preparation of a statewide plan. The executive order directs OPR, in cooperation with the Resources Agency, to provide land use planning guidance related to sea level rise and other climate change impacts.

Senate Bills 1078 and 107 and Executive Order S-14-08 (2008): SB 1078 (Chapter 516, Statutes of 2002) requires retail sellers of electricity, including investor owned utilities and community choice aggregators, to provide at least 20 percent of their supply from renewable sources by 2017. SB 107 (Chapter 464, Statutes of 2006) changed the target date to 2010. In November 2008, then Governor Schwarzenegger signed Executive Order S-14-08, which expands the state's Renewable Portfolio Standard to 33 percent renewable power by 2020.

SB X-1-2 and the Clean Energy and Pollution Reduction Act of 2015: SB X-1-2, signed by Governor Edmund G. Brown, Jr. in April 2011, created a new Renewables Portfolio Standard (RPS), which preempted ARB's 33 percent Renewable Electricity Standard. The new RPS applies to all electricity retailers in the state including publicly owned utilities (POUs), investor-owned utilities, electricity service providers, and community choice aggregators. These entities must adopt the new RPS goals of 20 percent of retail sales from renewables by the end of 2013, 25 percent by the end of 2016, and the 33 percent requirements by the end of 2020.

Clean Energy and Pollution Reduction Act of 2015, SB 350 (Chapter 547, Statutes of 2015) was approved by Governor Brown on October 7, 2015. SB 350 will (1) increase the standards of the California RPS program by requiring that the amount of electricity generated and sold to retail customers per year from eligible renewable energy resources be increased to 50 percent by December 31, 2030; (2) require the State Energy Resources Conservation and Development Commission to establish annual targets for statewide energy efficiency savings and demand reduction that will achieve a cumulative doubling of statewide energy efficiency savings in electricity and natural gas final end uses of retail customers by January 1, 2030; (3) provide for the evolution of the Independent System Operator (ISO) into a regional organization; and (4) require the state to reimburse local agencies and school districts for certain costs mandated by the state through procedures established by statutory provisions. Among other objectives, the Legislature intends to double the energy efficiency savings in electricity and natural gas final end uses of retail customers through energy efficiency and conservation.

SB 862: In June 2014, SB 862 (Chapter 36, Statutes of 2014) established long-term funding programs from the cap-and-trade program for transit, sustainable communities and affordable housing, and high speed rail. SB 862 allocates 60 percent of ongoing cap-and-trade revenues, beginning in 2015–2016, to these programs. The remaining 40 percent is to be determined by future legislatures. A minimum of 25 percent of cap-and-trade dollars must go to projects that provide benefits to disadvantaged communities, and a minimum of 10 percent must go to projects located within those disadvantaged communities. In addition, this bill established the CalRecycle Greenhouse Gas Reduction Revolving Loan Program and Fund.

Executive Order B-30-15 (2015) and SB32 (2016): Governor Brown signed Executive Order B-30-15 in 2015 in order to reduce GHG emissions by 40 percent below 1990 levels by 2030 to ensure California meets its target of reducing GHG emissions to 80 percent of 1990 levels by 2050. In particular, the Executive Order commissioned ARB to update the Climate Change Scoping Plan and the California Natural Resources Agency to update the state climate adaption strategy, Safeguarding California, every three years. The Safeguarding California Plan will identify vulnerabilities to climate change by sector and regions, including, at a minimum, the following sectors: water, energy, transportation, public health, agriculture, emergency services, forestry, biodiversity and habitat, and ocean and coastal resources; outline primary risks to residents, property, communities and natural systems from these vulnerabilities, and identify priority actions needed to reduce these risks; and identify a lead agency or group of agencies to lead adaptation efforts in each sector. SB 32 was signed into law in September 2016 and (amongst other things) requires ARB to ensure that greenhouse gas emissions in California are reduced to 40% below the 1990 level by 2030.

3.3.3.3 Local Regulations

3.3.3.3.1 Air District

The Air District established a climate protection program in 2005 to explicitly acknowledge the link between climate change and air quality. In November 2013, the Air District's Board of Directors adopted a resolution outlining greenhouse gas reduction goals of achieving an 80 percent reduction in GHG below 1990 levels by 2050 and making a commitment to develop a regional climate protection strategy. The Air District regularly prepares inventories of GHG, criteria pollutants and toxic air contaminants to support planning, regulatory and other programs.

The District adopted a 10-point Climate Action Work Program in March 2014. The work program outlines the District's priorities in reducing GHG emissions that include: (1) establishing the goal of reducing GHG emissions 80% below 1990 levels by 2050; (2) updating the District's regional GHG emission inventory; (3) implementing GHG emissions monitoring; (4) developing a regional climate action strategy to make progress toward the 2050 GHG emission reduction goal; (5) supporting and enhancing local actions through enhanced technical assistance to local governments in preparing local Climate Action Plans; (6) initiating rule development to enhance GHG reductions from sources subject to Air District regulations; (7) expanding enforcement of statewide regulations to reduce GHG emissions; (8) launching a climate change and public health impacts initiative; (9) reporting progress to the public toward the 2050 goals and related performance objectives; and (10) exploring the Bay Area's energy future, including trends in fossil fuel demand and productions and exploring opportunities to promote the development of clean energy options.

In 2015 the Air District launched a GHG measurement program to provide the scientific basis that supports rulemaking and policy development for reducing GHG emissions. The program started monitoring GHGs in 2016 and includes a long-term fixed-site GHG monitoring network that measures concentrations of carbon dioxide, methane, and carbon monoxide at four sites. A dedicated mobile GHG monitoring research van also provides assistance in identifying emission hot spots and enhancing the regional emissions inventory.

Finally, the 2017 Plan identifies control measures that include potential rules, programs, and strategies that the Air District can pursue to reduce GHG emissions in the Bay Area in support of the goals of reducing GHG emissions to 90 percent below 1990 levels by 2050.

3.3.3.3.2 Plan Bay Area (MTC/ABAG)

MTC and ABAG adopted Plan Bay Area in 2013. This Plan was developed in response to SB 375, which requires each metropolitan areas to adopt a Sustainable Communities Strategy to coordinate future development and transportation improvements in order to reduce greenhouse gas emissions. Plan Bay Area sets forth a strategy of concentrating development in Priority Development Areas while promoting the protection of Priority Conservation Areas. This strategy is intended to support an urban form which encourages infill and transit-oriented development in order to reduce both vehicle trips and vehicle miles traveled.

3.3.3.3.3 Local Governments

Counties within the Bay Area have prepared and adopted Climate Action Plans including Alameda County, Contra Costa County, Marin County, San Francisco County, San Mateo County, Sonoma County and Solano County. These plans outline the county's measures and actions to reduce GHG emissions with in each county's jurisdiction. Napa

County addressed climate change and sustainable practices in the Conservation Element of its General Plan. In addition, many cities have finalized and adopted community climate action plans, or are in the process of drafting climate action plans.

3.3.4 SIGNIFICANCE CRITERIA

It is the increased accumulation of GHGs in the atmosphere generated by human activities that may result in global climate change. Climate change involves complex interactions and changing likelihoods of diverse impacts. Due to the complexity of conditions and interactions affecting global climate change, it is not possible to predict the specific impact, if any, attributable to GHG emissions associated with a single project, which is why GHG emission impacts are considered to be a cumulative impact.

The significance criteria used to determine whether or not GHG emissions from the proposed project are cumulatively significant, impacts will be evaluated and compared to a no net increase in GHG emissions as a result of the control strategy in the 2017 Plan. If the control strategy will result in a reduction in GHGs in the Bay Area, it will have no adverse impact on global climate change. If the 2017 Plan will result in a net increase in GHG emissions, it will be considered to be a significant adverse impact on climate change.

3.3.5 ENVIRONMENTAL IMPACTS

As previously discussed, the proposed 2017 Plan sets forth a comprehensive roadmap for Air District actions over the next few years to reduce air pollution and protect public health and the global climate. These Air District actions are described in detail in Chapter 5 of the 2017 Plan (and in Volume II, which outlines the individual control measures), and they include:

1. Adopting mandatory regulations requiring stationary-source facilities to take actions to reduce their air emissions, pursuant to the District’s rulemaking authority under the California Health & Safety Code;

2. Using the District’s grants and incentives programs to provide monetary incentives for implementing voluntary actions to reduce emissions; and

3. Technical support, educational outreach, and advocacy efforts to promote sound policy development and healthy air quality choices throughout all sectors of our economy and society, including promoting best practices by public agencies and other entities through informational resources, model ordinances, guidance documents, and the like; outreach and education to engage with community groups and other organizations; and advocacy in support of legislative and regulatory action at the federal and state levels in order to promote the District’s air quality, public health, and climate protection goals.

The proposed control strategy for the 2017 Plan consists of eighty-five distinct measures targeting a variety of local, regional and global pollutants. Some measures are expected to reduce the full set of air pollutants and greenhouse gases (GHGs), while others target a limited subset of pollutants. Table 3.3-5 summarizes the expected GHG emission reductions associated with implementation of the 2017 Plan (see Volume II of the 2017 Plan for more information on a particular control measure). For some measures, emissions could not be estimated at this time. Estimating the emissions reductions of the control strategy is complicated by the fact that various control measures affect numerous emission sources, and a wide variety of implementation or compliance actions could be employed. In addition, the outcome of certain implementation actions (such as pursuing partnerships and collaborations, promoting adoption of model ordinance and best practices by local agencies, legislative advocacy, and public outreach and education) are impossible to quantify with any degree of certainty. In other cases, emission factors or methodologies have not yet been developed, additional technical information may be required, and the level of uncertainty is just too high to make a reasonable estimate of emission reductions associated with a particular control measure. Because of these challenges, the District will not provide emission reduction estimates associated with some of the control measures. Table 3.3-5 lists only those measures where a reasonable estimate could be made of the potential emission reductions that could be expected from implementation of the control measure. In addition, there were some control measures where emission reduction estimates were made but not included in Table 3.3-5 because the control measures would be implemented by others, such as MTC, or the potential impacts from the control measures could not be evaluated at this time so the emission reductions associated with the control measures were not included in Table 3.3-5, or the rule or regulation identified in the control measure has recently been adopted (e.g., SS2) by the Air District.

However, all proposed control measures are expected to reduce emissions of air pollutants and/or GHGs, either directly or indirectly, even if no specific emission reduction estimate can be provided at this time. The Air District will not proceed with implementation of a control measure if at the time of implementation, it cannot be determined that the control measure will result in cost effective reductions of either criteria pollutants, greenhouse gases or toxic air contaminants.

Even with these limitations, Table 3.3-5 shows an anticipated emissions reduction of over 1.5 MMTCO2e by 2030 based on 20-year Global Warming Potential factors.

TABLE 3.3-5
2017 Plan Estimated GHG Emission Reductions
From Potential Future Regulatory & Non-Regulatory Actions

No.	Title	2030 Estimated GHG Emission Reductions (MTCO2e/yr)	
		100-yr time frame	20-yr time frame
Stationary Source/Transportation/Waste Sectors			
SS1	Fluid Catalytic Cracking in Refineries		
SS5	Sulfur Recovery Units		
SS6	Refinery Fuel Gas		
SS7	Sulfuric Acid Plants		
SS14	Methane from Capped Wells	19	47
SS15	Natural Gas Processing and Distribution	283,062	715,980
SS19	Portland Cement	85,055	85,055
SS22	Stationary Gas Turbines		
SS23	Biogas Flares		
SS28	LPG, Propane, Butane		
SS29	Asphaltic Concrete		
SS30	Residential Fan Type Furnaces		
SS31	General PM Emissions Limits		
SS32	Emergency Backup Generators	2	2
SS34	Wood Smoke		
SS35	PM from Coke, Coal Storage and Handling		
SS36	PM from Track Out		
SS37	PM from Asphalt Operations		
TR14	Cars and Light Trucks	3,963	3,963
TR19	Medium and Heavy Duty Trucks	138,306	138,306
TR20	Ocean Going Vessels		
TR23	Lawn Care Equipment	21,854	21,854
WA1	Landfills	233,308	590,132
	Total (MTCO2e/yr)	765,569	1,555,339

The Initial Study (see Appendix A) determined that some of the control measures in the 2017 Plan could have ancillary adverse impacts that could result in increased GHG emissions region-wide, which could offset the emission reductions resulting from the Plan. For example, implementation of some of the control measures could involve retrofitting, replacing, or installing new air pollution control equipment, changes in product formulations, or construction of infrastructure that have the potential to generate GHG emissions. Therefore, this EIR evaluates whether any potential ancillary adverse GHG emissions impacts would offset the emission reductions resulting from implementation of the 2017 Plan.

This subchapter identifies and quantifies direct GHG emission effects, that is, emission reductions anticipated to occur as a result of implementing the various control measures. This subchapter also examines indirect or secondary GHG impacts, that is, potential GHG emission increases that could occur as a consequence of efforts to improve air quality (e.g., emissions from control equipment such as afterburners).

Section 3.1.2 provides a description of the types of air pollution control equipment that may be required to comply with implementation of the stationary source control measures. Please see Section 3.1.2 for further discussion of the air pollution control equipment that may be installed due to implementation of control measures in the 2017 Plan.

The net effect of implementing the 2017 Plan, is expected to be GHG emission reductions (see Table 3.3-5), providing a beneficial impact on climate change. However, some control technologies have the potential to generate secondary or indirect GHG emission impacts as part of the control process. Table 3.3-6 lists all of the air pollution control technologies that may be used to comply with future regulatory requirements, as well as potential secondary or indirect operational air quality impacts associated with each air pollution control technology. Those air pollution control technologies in Table 3.3-6 where no direct or indirect GHG emission impacts were identified are not discussed further in the following subsections. The subsections below further discuss those air pollution control technologies identified in Table 3.3-6 that have the potential to generate adverse direct or indirect operational GHG emission impacts.

TABLE 3.3-6
Potential Operational GHG Emission Impacts from Operating Air Pollution Control Equipment

Potential Control Technology	Direct or Indirect GHG Impacts Identified	Significant?
Baghouse	None identified	No
Cyclone	None identified	No
Diesel Oxidation Catalyst	None identified	No

Potential Control Technology	Direct or Indirect GHG Impacts Identified	Significant?
Diesel Particulate Filter	None identified	No
Electrostatic Precipitator (Wet & Dry)	None identified	No
Flue Gas Treatment (Additive to Existing Amine System	None identified	No
Flue Gas Treatment (Merox)	None identified	No
Selective Oxidation Catalyst	None identified	No
Selective Catalytic Reduction	Indirect GHG emissions	No
SOx Reducing Additive	Indirect and direct GHG emissions	No
Replace Old Diesel ICEs with New Diesel ICEs	None identified	No
Wet Gas Scrubber	Indirect GHG emissions	Yes
Thermal Oxider/Flare	Direct GHG emissions	Yes
Carbon Adsorption	Indirect and direct GHG emissions	Yes

Selective Catalytic Reduction

SCRs have been used to control NOx emissions from stationary sources for many years. SCR promotes chemical reactions in the presence of a catalyst. Installation of new SCR equipment or increasing the control efficiency of existing equipment would be expected to increase the amount of ammonia used for NOx control. SCRs would require the additional delivery of ammonia or urea to the facilities where they are installed. It is estimated that about 40 truck trips per year would be required for the delivery of ammonia/urea. This amount could vary depending on the size of the SCR and size of the ammonia or urea storage systems. However, the 40 trucks per year is expected to provide a conservative estimate of transportation requirements. The emissions associated with these truck deliveries are included in Table 3.3-7 and are expected to be minor.

TABLE 3.3-7
Potential Indirect GHG Emission Impacts Associated with Transportation Activities Related to Air Pollution Control Equipment

Material	Trucks per year	Trip Length (roundtrip miles)	Emission Factor (MT/mile)[(1)]	CO2e (MT/year)
Caustic/catalyst for 6-8 WGSs	300 – 400	120	0.0018	85

Material	Trucks per year	Trip Length (roundtrip miles)	Emission Factor (MT/mile)(1)	CO2e (MT/year)
Ammonia for 10 SCRs	400	100	0.0018	71
Waste Disposal	730	150	0.0018	197
Sodium bicarbonate(2)	205			134
Total				487

(1) Emfac2014 emission factors for the Bay Area AQMD. Operating year 2018.
(2) See BAAQMD Regulation 9-14 Initial Study/Negative Declaration.

Waste Disposal is expected to be required due to a number of control measures including any of the control measures that require demolition; emission control equipment that would use baghouses, particulate traps or other filters; catalyst replacement associated with air pollution control equipment (e.g., SCRs); carbon adsorption; retirement of equipment (e.g., lawn and garden equipment); and conversion of cars or trucks to electric vehicles. In order to estimate potential GHG emissions associated with the transport of waste materials related to the plan it was assumed that two trucks per day or 730 trucks per year would be required.

Wet Gas Scrubbers

The primary air quality effect of installing WGS is a reduction in SO_2 emissions, providing a beneficial air quality impact. But indirect emission impacts could occur from haul trucks associated with delivering supplies (i.e., fresh catalyst and caustic solution to refill the storage tanks) on a regular basis. For example, catalyst and caustic solutions are typically used in relatively small amounts per day. Depending on the size and configuration of the WGS, sodium hydroxide (NaOH) caustic solution used in the WGS would likely need to be delivered one time per week or a little over 50 additional delivery truck trips per year.

Because haul truck trips transporting caustic would occur relatively infrequently and it is not likely that all affected facilities would use a WGS, a single haul truck's emissions carrying caustic from San Jose to Benicia[1], for example, would be very low. As shown in Table 3.3-7, indirect mobile source emissions from transporting caustic would be low.

SOx Reducing Additive

Implementation of SS8 – Coke Calcining is expected to require upgrades to the dry sorbent injection (DSI) emission control system. A dry scrubber, also called DSI is a technology currently used remove SO_2 from coke calcining. In this process, the flue gas

[1] Review of caustic suppliers located a chemical supplier in San Jose. The haul truck trip from San Jose to the Valero Refining Company in Benicia would likely represent a conservative trip length assumption because trip lengths to all other affected facilities would be shorter.

containing SO_2 is contacted with an alkaline material (sodium bicarbonate) to produce a dry waste product for disposal and CO_2 as a byproduct. The facility injects sodium bicarbonate sorbent material into the flue acid-gas stream after exiting a heat recovery system. The current control systems reduce SO_2 emissions by 37 to 47 percent. Newer and more efficient dry sorbent injection systems achieve control efficiencies ranging from 50 to up to 80 percent, but will require additional sodium bicarbonate and generate more CO_2 because more SO_2 is being removed. The emissions associated with the additional sodium bicarbonate truck deliveries are included in Table 3.3-7 and are expected to be minor. As shown in Table 3.3-8, the additional direct GHG emissions from SO_2 scrubbing are 658 metric tons per year.

TABLE 3.3-8
Potential Direct GHG Emission Impacts Associated with Air Pollution Control Equipment

Control Equipment	CO_2e (MT/year)
Dry Sorbent Injection	658
Thermal Oxidizer	24,269
Total	24,927

(1) EMFAC2014 emission factors for the Bay Area AQMD. Operating year 2018.
(2) See Initial Study/Negative Declaration for BAAQMD Regulation 9-14.

Thermal Oxidizers/Flares

A number of control measures could result in a decrease in ROG emissions from various facilities including: SS5 (Sulfur Recovery Units); SS11 (Petroleum Refining Facility-Wide Emission Limits); SS20 (Air Toxics Risk Cap and Reduction from Existing Facilities); SS23 (Biogas Flares); and WA1 (Landfills). The methods to control ROG emissions could include vapor recovery devices such as afterburners, incinerators, or flares, resulting in combustion emissions, including GHG emissions.

In the Negative Declaration for modifications to Rule 2-5 (Control Measure SS21 in the 2017 Plan), the potential air quality impacts included the emissions associated with the installation of thermal/catalytic oxidizers were calculated. The direct operational GHG emissions associated with the installation of 80, 3.0 mm Btu/hr thermal oxidizers are 24,269 metric tons per year (see Table 3.3-8). While some control measures may cause a small increase in GHG emissions, the 2017 Plan control measures will achieve an overall reduction in GHG emissions. The emission control devices require air permits to operate. GHG emissions from vapor recovery devices are generally controlled by using efficient combustion practices and enforced with permit conditions.

Carbon Adsorption (Activated Carbon)

Activated carbon is a form of carbon processed to have small, low-volume pores that increase the surface area available for adsorption or chemical reactions. Adsorption is the attachment or adhesion of atoms, ions and molecules (adsorbates) from a gaseous, liquid or solution medium onto the surface of an adsorbent. Carbon adsorption could be used to control VOC emissions and TACs. Carbon adsorption could generate GHG emissions from truck deliveries and regeneration of spent carbon. However, the amount of carbon required is speculative. Further, thermal oxidizers could be used instead of carbon, and would have a greater impact on GHG emissions.

Electricity

Electricity is often used as the power source to operate various components of add-on control equipment, such as ventilation systems, fan motors, vapor recovery systems, etc. Increased demand for electrical energy may require generation of additional electricity, which in turn could result in increased GHG emissions in the Bay Area and in other portions of California. Implementation of the 2017 Air Plan would result in the installation of additional air pollution control equipment that would increase electricity use. Table 3.3-9 provides estimates of electricity demand as well as the estimated GHG emissions associated with the various control measures including installation of new air pollution control equipment, as well as electrification of specific control measures (e.g., lawn care equipment and shore power for vessels at berth).

In addition to the above, an increase in the use of electric vehicles would require the generation of additional electricity in the Air District and other areas of California. The potential increase and amount of electricity is unknown. Because the control measures are general in nature, it is difficult to determine what, if any, impacts could be expected. Several control measures target emission reductions from transportation measures that would encourage the development of vehicle control technology to achieve zero emission vehicle standards. Such technology would include electric and hybrid electric vehicles as a result of advanced battery technology and development of property support infrastructure. The increased demand for electrical energy may require generation of additional electricity, which in turn may result in increased indirect GHG emissions (due to the increase in natural gas combustion used to generate more electricity). In addition, the amount of electricity generated is described in the energy impacts Subchapter 3.8 of this EIR.

TABLE 3.3.9
Potential Increase in Electricity Demand Associated with 2017 Plan

Facility	No. of Units	Potential Increased Electricity Demand (MWhr/yr)	Emission Factor (lb/MWhr)(1)	Emissions (MT/yr)
WGS at Refineries(2)	5	1,305	644	381
WGS at Sulfuric Acid Plant(3)	3	10,577	644	3,088
SCRs(4)	10	2,219	644	648
Caustic Soda Manufacture(4)	--	13,140	644	3,836

Facility	No. of Units	Potential Increased Electricity Demand (MWhr/yr)	Emission Factor (lb/MWhr)(1)	Emissions (MT/yr)
Lawn Care Equipment(6)	26,000	9,490	644	2,770
Shore Power for Marine Vessels(7)	--	219,000	644	63,930
TOTAL		255,731	644	74,653

(1) CAPCOA, 2016. Based on PG&E emission factors from CalEEMod.

(2) SCAQMD, 2007. Final EIR for ConocoPhillips Los Angeles Refinery PM10 and NOx Reduction Project, SCH No. 2006111138

(3) SCAQMD, 2011. CEQA Evaluation of the Rhodia Inc. Wet Gas Scrubber/SOx RECLAIM Project.

(4) SCAQMD, 2015. Program Environmental Assessment for Proposed Amended Regulation XX – Regional Clean Air Incentives Market (RECLAIM). SCH No. 2014121018.

(5) SCAQMD, 2015. Calculated assuming it takes approximately 2,500 kWh to produce on metric ton of caustic (sodium hydroxide). Refinery WGS are assumed to use 4.800 lbs of caustic per day and WGS at sulfuric acid plants are assumed to use 2,600 lbs per day for a total of 31,800 lbs/day or about 14 tons per day in the District.

(6) BAAQMD 2017 Clean Air Plan. Assumes the conversion of 2,000 pieces of equipment per year through 2030. Based on 200 days/year operation at 1 kWh.

(7) Based on Port of Los Angeles, 2014 that assumes implementation of ARB's At-Berth Regulation would increase peak electricity demand by 30 MW.

Electrification of motor vehicles and other commercial and industrial equipment will reduce petroleum fuel usage in the Bay Area. At that time, there may be an increase in GHG emissions due to increased electric power generation due to increased demand. The number of fossil-fuel vehicles/equipment that would be replaced with electric vehicles/equipment is unknown at this time. While the control measures may cause an increase in GHG emissions associated with increased electricity generation, the generation of electricity using natural gas or alternatives sources is expected to result in fewer GHG emissions than vehicles and equipment that use fossil fuels.

If electricity demand exceeds available power, additional sources of electricity would be required. New power generating equipment would not result in air quality impacts because they would be subject to BACT requirements, and all GHG emission increases would have to be regulated (through ARB's cap and trade). Further, electricity in California is increasingly generated by alternative sources that include hydroelectric plants, geothermal energy, wind power, and solar energy, which are clean sources of energy. California's renewables portfolio standard (RPS) requires retail sellers of electricity to increase their procurement of eligible renewable energy resources by at least one percent per year so that 20 percent of their retail sales are procured from eligible renewable energy resources by 2017 and to 50 percent by December 31, 2030. These regulatory requirements are expected to move California towards the use of more renewable sources of electricity, reducing the use of fossil fuels. These renewable sources of electricity generate little, if any, GHG emissions. Increased use of these and other clean technologies will continue to minimize GHG emissions from the generation of electricity.

The 2017 Plan is designed to reduce criteria, GHG and TAC emissions in order to meet federal and state air quality standards, reduce exposure to TACs, and reduce impacts on climate change. The 2017 Plan has the potential to create impacts on electricity demand; however, the existing and future air quality and GHG rules and regulations are expected to minimize operational emissions associated with increased electrical generation. Furthermore, electricity providers are moving towards compliance with California's RPS and generate 50 percent of their electricity from renewable energy resources by 2030.

GHG Emissions Leakage

In the context of the 2017 Plan, emissions leakage is essentially the introduction of an air quality regulation in one jurisdiction that causes an increase in production costs to industry such that industry moves the production to another jurisdiction that does not have a similar regulation. This could lead to an increase in GHG emissions associated with production and transportation of the goods back to the Bay Area for retail sales. Proposed Rule 12-16 (SS11–Petroleum Refining Emissions) would establish GHG emission caps on refineries or refinery dependent businesses in the Bay Area, which could theoretically result in emissions leakage as defined above. However, based on annual GHG emissions for each affected facility from the year 2012 through 2015, the latest year information is available, no facility exceeded its currently proposed Rule 12-16 GHG cap for any year in which data is available. Based on the data in Table 3.3-10, it appears that affected facilities would be in compliance with Rule 12-16, and as a result emissions leakage would not occur as a result of Rule 12-16.

TABLE 3.3-10
Annual GHG Emission Inventories for Facilities Subject to Rule 12-16
(CO_2e in metric tons/year)

Facility	2012 GHG Inventory	2013 GHG Inventory	2014 GHG Inventory	2015 GHG Inventory	Proposed Rules 12-16 Cap
Chevron Richmond	4,126,095	4,087,322	4,120,931	4,420,335	4,774,356.00
Shell Martinez	4,366,858	4,191,585	3,968,978	4,131,880	4,559,540.00
Phillips 66 San Francisco	1,320,965	1,363,918	1,276,578	1,320,782	1,607,925.00
Tesoro Martinez	2,089,720	2,445,615	2,334,466	2,056,107	2,615,047.00
Valero Benicia	2,939,902	2,738,051	2,710,549	2,839,357	3,145,008.00
Martinez Cogen LP	413,261	386,217	411,584	401,277	450,633.00
Air Liquide H2 Rodeo	770,858	884,931	815,746	819,886	946,876.00
Air Products H2 Martinez	217,135	270,753	255,203	196,728	289,706.00

Construction Activities

Most of the stationary source control measures have the potential to generate construction activities to install air pollution control equipment or modify operations to reduce emissions, including SS1, SS5, SS6, SS7, SS8, SS11, SS20, SS22, SS23, SS31, SS35, AG1, and WA1. It is impossible to predict at the Plan stage all of the construction activities that may be required, or how, when, or where they may be carried out. However, construction activities can be estimated for implementation of some of the control measures.

Construction activities associated with installing air pollution control technologies would result in GHG emissions, although the amount generated by specific types of equipment can vary greatly as shown in Table 3.3-11. The estimated emissions for construction equipment operating on a typical eight-hour day are also provided in Table 3.3-11.

TABLE 3.3-11
GHG Emission Estimates for Typical Construction Equipment Assuming an 8-Hour Operational Day(1)

Equipment Type	CO_2e (MT/hr)	CO_2e (MT/8-hr day)
Bore/Drill Rigs	0.06	0.47
Cranes	0.04	0.28
Excavators	0.03	0.26
Graders	0.04	0.33
Pavers	0.03	0.23
Paving Equipment	0.02	0.20
Rollers	0.02	0.13
Rough Terrain Forklifts	0.02	0.17
Rubber Tired Dozers	0.05	0.42
Rubber Tired Loaders	0.04	0.31
Scrapers	0.09	0.75
Skid Steer Loaders	0.01	0.10
Surfacing Equipment	0.04	0.34
Tractors/Loaders/Backhoes	0.02	0.15
Trenchers	0.02	0.17
Aerial Lifts	0.01	0.09
Forklifts	0.01	0.08

(1) Emission Factors from Off-Road 2011.

The 2017 Air Plan could result in the construction of various types of control equipment. Under SS1 - Fluid Catalytic Cracking in Refineries, it is assumed that three refineries would need to install wet gas scrubbers. SS7 – Sulfuric Acid Plants is expected to require wet gas scrubbers on up to three facilities. SS31 – General PM Emissions Limits is expected to require the construction of ESPs or baghouses at four BART car cleaning facilities. SS5 – Sulfur Recovery Units and SS6 -Refinery Fuel Gas may require the construction of wet gas scrubbers but the number of units that may be required is not known. S11 – Petroleum Refining Facility-Wide Emission Limits could require construction of various types of air pollution control equipment or refinery modification to comply with potential emission limits on refineries. SS20 – Revisions to Air Toxics Hotspots Program could require construction of air pollution control equipment or facility modifications to comply with reduced risk requirements. SS22 – Stationary Gas Turbines is expected to require new SCR equipment on about six gas turbines. Finally, SS35 – PM from Coke, Coal Storage and Handling could require construction of structures to prevent wind-blown dust at bulk material handling facilities.

Several construction scenarios for installing various types of control equipment were identified in order to estimate the magnitude of GHG emissions associated with activities.

Installing a Wet Gas Scrubber (major construction activities)

Construction associated with installing a WGS would require more demolition and construction equipment and activities than installing other types of control technologies and, therefore, would provide a "worst-case" analysis. Control measure SS1 is expected to require the installation of WGS on FCCUs at three refineries and SS7 may require up to three WGS on sulfuric acid plants. In addition, WGS could be installed to comply with regulations that may be imposed on refineries and other industrial under SS5 – Sulfur Recovery Unit, SS6 – Refinery Fuel Gas, SS11 – Petroleum Refining Facility-Wide Emission Limits, and SS20 – Air Toxics Risk Reduction from Existing Facilities.

The 2017 Plan could result in the construction of five WGS at refineries and three at Sulfuric Acid Plants. Construction activities for installation WGS was estimated based on CEQA analyses completed for the installation for other projects. The estimated GHG emissions associated with the construction of six to eight WGS is estimated 204 – 272 metric tons of CO_2e (amortized over 30-years) (see Table 3.3-12). Construction emissions are temporary as construction emissions would cease following completion of construction activities.

TABLE 3.3-12
Estimated Construction Emissions for Wet Gas Scrubber(1)

ACTIVITY	CO_2e (metric tons)
Construction Activities for 1 WGS	1,020
Construction Emissions for 3-5 WGS on Refinery Units	3,060 - 5,100
Construction Emissions for WGS at 3 Sulfuric Acid Plants	3,060

Construction Emissions Associated with Installation of 6 – 8 WGS	**6,120 - 8,160**
30-year Amortized Construction Emissions Associated with Installation of 6 – 8 WGS (metric tons per year)	**204 - 272**

(1) Reference: SCAQMD 2011, CEQA Evaluation for the Rhodia Inc. Wet Gas Scrubber/SOx RECLAIM Project (Facility J) http://www.aqmd.gov/docs/default-source/ceqa/documents/permit-projects/2011/ceqa-evaluation-of-the-rhodia-inc-wet-gas-scrubber-sox-reclaim-project.pdf?sfvrsn=6

<u>Construction of Other Types of Air Pollution Control Equipment (medium construction activities)</u>

Other control measures could require the installation of air pollution control equipment. SS31 – General PM Emissions Limits is expected to require the construction of ESPs or baghouses at four BART car cleaning facilities. SS22 – Stationary Gas Turbines is expected to require new SCR equipment on about six gas turbines.

In a recent CEQA document, the SCAQMD estimated the construction emissions associated with installing air pollution control equipment at non-refinery facilities (SCAQMD, 2015). Table 3.3-13 provides the estimated construction emissions associated with the installation of control equipment (e.g., SCRs and ESPs) at one facility.

TABLE 3.3-13
Construction Emissions for General Air Pollution Control Equipment[(1)]

Construction Emissions	CO_2e (MT)	30-Year Amortized CO_2e (MT/yr)
Total Construction Emissions for one facility[(2)]	4,576.7	152.6
Total Construction Emissions for ten facilities[(3)]	**4,576.6**	**1,525.6**
DPF [(4)]	2.9	0.1
Enclosures[(4)]	957.3	31.9
Oxidizers[(4)]	178.8	6.0

(1) Reference: SCAQMD 2015, Program Environmental Assessment for Proposed Amended Regulation XX – Regional Clean Air Incentives Market.
(2) Based on 9 projects with 1,373 metric tons per year of amortized GHG emissions.
(3) Assumes the 2017 Plan will require control equipment on at least 10 facilities.
(4) DPF assumes 7 projects per year and 3 days of construction activities per project. Enclosures assume 3 projects per year and 239 days of construction activities per project. Oxidizers assume 80 per year and 21 days of construction activity per project.

In addition, other control measures may also require construction activities. SS20 – Revisions to Air Toxics Hotspot Program could require construction of air pollution control equipment or facility modifications on a number of facilities to comply with reduced risk requirements. SS35 – PM from Coke and Coal Storage and Handling Facilities could also result in the construction of structures to enclose storage piles. The number of facilities that could potentially be affected by these control measures is not currently known. A reasonable estimate of construction activities associated with implementation of SS20 and SS35 would be the emission estimates for the medium-sized construction activities outlined in Table 3.3-13. However, since the number of facilities that may be required under these control measures are not known, the total construction emission estimates cannot be provided.

In addition, a Negative Declaration was prepared for Rule 2-5 New Source Review for Toxic Air Contaminants (SS21) which estimated the construction emissions associated with installation of diesel particulate filters (DPF), enclosures and oxidizers to be as follows: 2.9, 957.3, and 178.8 metric tons of GHG emissions and are included in Table 3.3-13. Under Control Measure SS21 (Rule 2-5) it was assumed that seven DPFs, three enclosures and five oxidizers would be constructed.

In addition, SS3 – Cooling Towers (Rule 11-10) and SS19 – Portland Cement (Rule 9-13) were recently approved by the Air District as modifications to existing rules. No construction activities were associated with the implementation of either rule.

Table 3.3-14 summarizes the potential construction impacts associated with implementation of the 2017 Plan for those control measures where sufficient information is available to estimate construction emissions. The total construction GHG emissions estimates associated with the 2017 Plan is 11,836 to 13,876 metric tons or 1,768 to 1,836 metric tons per year amortized over 30 years. As noted above, construction emissions are temporary as construction emissions would cease following completion of construction activities.

TABLE 3.3-14
2017 Plan Construction Emissions Summary

Construction Emissions	CO_2e (MT)	30-Year Amortized CO2e (MT/yr)
Construction Emissions Associated with Installation of WGS(1)	6,120 - 8,160	204 - 272
Construction Emissions for 10 Non-Refinery Facilities (tons)(2)	4,577	1,526
DPF, Enclosures, Oxidizers(2)	1,139	38
Total Estimated Construction Emissions	**11,836 – 13,876**	**1,768 – 1,836**

(1) See Table 3.3-12
(2) See Table 3.3-13

3.3.6 CONCLUSIONS

Table 3.3-15 provides a summary of the estimated GHG emission increases associated with implementation of the 2017 Plan, along with the estimated decreases in GHG emissions associated with the 2017 Plan. As shown in Table 3.3-15, the emission reductions from the 2017 Plan are expected to far outweigh any potential secondary emission increases associated with the 2017 Plan, providing a beneficial impact on climate change. As previously mentioned, GHG analysis is cumulative in nature. Since the 2017 Plan is a GHG emission benefit, the GHG emissions impacts from the 2017 Plan are not cumulatively considerable.

TABLE 3.3-15
GHG Emissions Summary
(MT/year)

Emission Source	**CO_2e* (MT/year)**
Total Estimated GHG Construction Emissions Increases[(1)]	1,836
Total Indirect Transportation GHG Emissions Increases[(2)]	487
Total Indirect GHG Emissions Increases from Electricity[(3)]	74,653
Total Direct GHG Emissions Increases[(4)]	24,927
Total Estimated GHG Emission Increases Associated with the 2017 Plan	101,903
Estimated GHG Emission Reductions[(5)]	**1,555,339**

* Based on 20-year GWP factors

(1) See Table 3.3-14;
(2) See Table 3.3-7
(3) See Table 3.3-9
(4) See Table 3.3-8
(5) See Table 3.3-5

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CHAPTER 3.4 HAZARDS AND HAZARDOUS MATERIALS

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3.4 HAZARDS AND HAZARDOUS MATERIALS

3.4.1 INTRODUCTION

The 2017 Plan is intended improve air quality, protect public health, and protect the climate. Some of the proposed measures intended to achieve these goals may, however, have direct or indirect hazards associated with their implementation. Hazard concerns are related to the potential for fires, explosions or the release of hazardous substances in the event of an accident or upset conditions.

This chapter of the EIR evaluates the 2017 Plan as a whole, including the 85 associated control measures, to determine whether the Plan could result in any significant hazards or hazardous materials impacts. The Initial Study which was prepared for the 2017 Plan determined that some control measures have the potential to create direct or indirect hazard impacts. Some control measures that would regulate VOC emissions by establishing VOC content requirements for products such as coatings may result in formulating these products with materials that are low or exempt VOC materials. Such reformulated products could have increased hazardous physical or chemical properties compared to the products that are currently being used, which could increase hazards through routine transport for disposal or through upset conditions involving an accidental result of these materials into the environment. Control measures that could require a control device to be installed may increase the hazards or release at industrial facilities due to failure of the control equipment, which would then create an increase in potential hazard impacts in the event of an accidental release of hazardous materials into the environment. Hazards could also be generated by the conversion of gasoline-fueled mobile sources to alternative fuels such as natural gas and propane, etc. This subchapter evaluates the potential hazards and hazardous materials impacts that could result due to implementation of the proposed control measures.

3.4.2 ENVIRONMENTAL SETTING

The potential for hazards exists in the production, use, storage and transportation of hazardous materials. Hazardous materials may be found at industrial production and processing facilities. Some facilities produce hazardous materials as their end product, while others use such materials as an input to their production process. Examples of hazardous materials used as consumer products include gasoline, solvents, and coatings/paints. Hazardous materials are stored at facilities that produce such materials and at facilities where hazardous materials are a part of the production process. Specifically, storage refers to the bulk handling of hazardous materials before and after they are transported to the general geographical area of use. Currently, hazardous materials are transported throughout the district in great quantities via all modes of transportation including rail, highway, water, air, and pipeline.

The potential hazards associated with industrial activities are a function of the materials being processed, processing systems, and procedures used to operate and maintain the facility. The hazards that are likely to exist are identified by the physical and chemical properties of the materials being handled and their process conditions, including the following events:

- **Toxic gas clouds:** Toxic gas clouds are releases of volatile chemicals (e.g., anhydrous ammonia, chlorine, and hydrogen sulfide) that could form a cloud and migrate off-site, thus exposing individuals. "Worst-case" conditions tend to arise when very low wind speeds coincide with an accidental release, which can allow the chemicals to accumulate rather than disperse.

- **Torch fires (gas and liquefied gas releases), flash fires (liquefied gas releases), pool fires, and vapor cloud explosions (gas and liquefied gas releases):** The rupture of a storage tank or vessel containing a flammable gaseous material (like propane or gasoline), without immediate ignition, can result in a vapor cloud explosion. The "worst-case" upset would be a release that produces a large aerosol cloud with flammable properties. If the flammable cloud does not ignite after dispersion, the cloud would simply dissipate. If the flammable cloud were to ignite during the release, a flash fire or vapor cloud explosion could occur. If the flammable cloud were to ignite immediately upon release, a torch fire would ensue.

- **Thermal Radiation:** Thermal radiation is the heat generated by a fire and the potential impacts associated with exposure. Exposure to thermal radiation would result in burns, the severity of which would depend on the intensity of the fire, the duration of exposure, and the distance of an individual to the fire.

- **Explosion/Overpressure:** Process vessels containing flammable explosive vapors and potential ignition sources are present at industrial facilities, e.g., refineries and chemical plants. Explosions may occur if the flammable/explosive vapors came into contact with an ignition source. An explosion could cause impacts to individuals and structures in the area due to overpressure.

3.4.2.1 Hazardous Materials Incidents

The Department of Transportation, Office of Pipeline and Hazardous Materials Safety Administration (PHMSA) utilizes a post incident reporting system that collects data on incidents involving accidents. Information on accidental releases of hazardous materials are reported to PHMSA. In 2015, 1,489 hazardous materials incidents that occurred within California were reported to PHMSA. The incidents resulted in 295 non-hospitalized injuries, 94 people hospitalized, 11 fatalities, and approximately $107 million in damages (PHMSA, 2016).

In the last ten years, 42 hazardous materials incidents related to anhydrous or aqueous ammonia that occurred within California have been reported to PHMSA. Six of those incidents occurred in the Bay Area. The Bay area incidents resulted in no injuries (hospitalized or non-hospitalized and caused about $5,200 in damages (PHMSA, 2016).

In the last ten years, 250 hazardous materials incidents involving ethanol occurred in California that were reported to PHMSA. Of those incidents, 48 occurred within the Bay Area. The incidents resulted in no injuries (hospitalized or non-hospitalized) and caused about $52,400 in damages (PHMSA, 2016).

The California Hazardous Materials Incident Reporting System (CHMIRS) is a post incident reporting system to collect data on incidents involving the accidental release of hazardous materials. Information on accidental releases of hazardous materials are reported to and maintained by Cal EMA. While information on accidental releases are reported to Cal EMA, Cal EMA no longer conducts statistical evaluations of the releases. PHMSA provides access to retrieve data from the Incident Reports Database, which also includes non-pipeline incidents, e.g., truck and rail events. Incident data and summary statistics, e.g., release date geographical location (state and county) and type of material released, are available online from the Hazmat Incident Database.

Table 3.4-1 provides a summary of the reported hazardous materials incidents in the nine counties within the Bay Area. In 2015, there were a total of 1,272 incidents reported in the nine counties regulated by the Air District (see Table 3.4-1), with the most incidents (292) reported in Alameda County.

The location of the spills varies (see Table 3.4-2). In the nine counties that comprise the Air District, hazardous materials incidents during transportation, at waterways, and at commercial facilities were the most common locations, respectively, for hazardous materials incidents. About 17 percent of the hazardous materials incidents that occurred within California occurred within the nine counties that comprise the Bay Area, with spills in industrial areas the most common (27 percent), followed by waterways (22 percent) and commercial areas (20 percent).

TABLE 3.4-1
Bay Area Hazardous Materials Incidents 2015, by County

COUNTY	REPORTED INCIDENTS
Alameda	292
Contra Costa	248
Marin	70
Napa	22
San Francisco	90
San Mateo	108
Santa Clara	198
Solano*	134
Sonoma*	110
Total No. of Reported Incidents	1,272

Source: OES, 2016
* Not all of Solano or Sonoma Counties are within the jurisdiction of the Air District

TABLE 3.4-2
Hazardous Materials Incidents 2015

Spillsite	Air District	Statewide	Percent of State Total
Waterways	160	734	22%
Transportation	480	2843	17%

Spillsite	Air District	Statewide	Percent of State Total
Industrial	81	298	27%
Commercial	266	1364	20%
Residential	162	895	18%
Utilities	26	194	13%
Military	1	61	2%
Other	96	928	10%
Total	**1,272**	**7,317**	**17%**

Source: OES, 2016

3.4.2.2 Hazards Associated with Air Pollution Control and Alternative Fuels

The Air District has evaluated the hazards associated with previous air plans (2010 Clean Air Plan) and proposed Air District rules. The analyses covered a range of potential air pollution control technologies and equipment. EIRs prepared for the previous air plans have specifically evaluated hazard impacts from: (1) add-on control equipment; (2) alternative coating methods; and (3) alternative fuels.

Add on pollution control technologies include carbon adsorption, incineration, post-combustion flue-gas treatment, SCR and selective non-catalytic reduction, scrubbers, bag filters and electrostatic precipitators. The use of add-on pollution control equipment may concentrate or utilize hazardous materials. A malfunction or accident when using add-on pollution control equipment could potentially expose people to hazardous materials, explosions, or fires. The transport, use, and storage of ammonia, both aqueous and anhydrous, (used in SCR systems) may result in a release in the event of an accident. Previous studies have indicated that the use of aqueous ammonia (instead of anhydrous ammonia) can usually reduce the hazards associated with ammonia use in SCR systems.

The potential hazards associated with alternative coating methods were analyzed in the Air District's 2010 Clean Air Plan and determined to be less than significant. The greatest hazard associated with both current and alternative coating methods is flammability. It is expected that the lower VOC content materials will contain less hazardous materials, or non-hazardous materials, as compared to conventional products, resulting in a net benefit regarding hazards (BAAQMD, 2010).

Alternative fuels may be used to reduce emissions from both stationary source equipment and motor vehicles. The alternative fuels may include compressed natural gas, propane, biodiesel, and electrically charged batteries. Like conventional fossil fuels, alternative fuels may create fire hazards, explosions or accidental releases during fuel transport, storage, dispensing, and use. Electric batteries also present a fire and explosion hazards due to the presence of reactive compounds, which may be subjected to high temperatures.

3.4.2.2.1 Natural Gas

Compressed Natural Gas or CNG is essentially no different from the natural gas used in homes and businesses every day, except that it has been compressed to less than 1% of its volume at standard pressure and temperature (Alternative Fuels Data Center, 2017). Unlike conventional fuels and other alternative fuels, CNG is usually produced onsite using existing natural gas infrastructure and onsite compressors. CNG is sold at 173 stations in California (AFDC, 2016).

CNG is lighter than air and readily disperses. CNG has a higher auto ignition temperature than conventional fuels. The main hazard associated with the use of CNG is the exposure to high pressure during storage, dispensing, and operations. The extreme cold of CNG can directly cause injury or damage. While CNG itself does not irritate the skin, the compressed gas becomes very cold upon escaping from a pressure tank, and may cause frostbite, should it contact unprotected skin. Although momentary contact on the skin can be harmless, extended contact will cause severe freeze burns. Although not poisonous, exposure to the center of a vapor cloud could cause asphyxiation due to the absence of oxygen. CNG vapor clouds can ignite within the portion of the cloud where the concentration of natural gas is between a five and a 15 percent (by volume) mixture with air (CEC, 2009). To catch fire, however, this portion of the vapor cloud must encounter an ignition source. Otherwise, the CNG vapor cloud will simply dissipate into the atmosphere. An ignited CNG vapor cloud is very dangerous, because of its tremendous radiant heat output. A release from a CNG pressure vessel, if ignited, would produce a torch fire.

3.4.2.2.2 Propane

Propane (sometimes called LPG) is a three carbon molecule that is a colorless, odorless gas that is compressed and stored at pressure as a liquid. Approximately 1,200 facilities in California dispense propane. Nearly all of these facilities are used primarily to fuel residential and commercial applications such as heaters, recreational vehicles and barbeques. About half of all these facilities are capable of providing propane as a motor fuel, though only about three percent of all the fuel dispensed is used for transportation applications (CEC, 2016).

Propane vehicles emit about one-third fewer reactive organic gases than gasoline-fueled vehicles. Nitrogen oxide and carbon monoxide emissions are also 20 percent and 60 percent less, respectively. Unlike gasoline-fueled vehicles, there are no evaporative emissions while LPG vehicles are running or parked, because LPG fuel systems are tightly sealed. Small amounts of LPG may escape into the atmosphere during refueling, but these vapors are 50 percent less reactive than gasoline vapors, so they have less of a tendency to generate smog-forming ozone. LPG’s extremely low sulfur content means that the fuel does not contribute significantly to acid rain.

Many propane vehicles are converted gasoline vehicles. The relatively inexpensive conversion kits include a regulator/vaporizer that changes liquid propane to a gaseous form and an air/fuel mixer that meters and mixes the fuel with filtered intake air before the mixture is drawn into the engine's combustion chambers. Also included in conversion kits is closed-loop feedback circuitry that continually monitors the oxygen content of the exhaust and adjusts the air/fuel ratio as necessary. This device communicates with the vehicle's onboard computer to keep the engine running at optimum efficiency. LPG vehicles additionally require a special fuel tank that is strong enough to withstand the LPG storage pressure of about 130 pounds per square inch. The gaseous nature of the fuel/air mixture in an LPG vehicle's combustion chambers eliminates the cold-start problems associated with liquid fuels. In contrast to gasoline engines, which produce high emission levels while running cold, LPG engine emissions remain similar whether the engine is cold or hot. Also, because LPG enters an engine's combustion chambers as a vapor, it does not strip oil from cylinder walls or dilute the oil when the engine is cold. This helps LPG powered engines to have a longer service life and reduced maintenance costs. Also helping in this regard is the fuel's high hydrogen-to-carbon ratio (C3H8), which enables propane powered vehicles to have less carbon build-up than gasoline- and diesel powered vehicles.

LPG delivers roughly the same power, acceleration, and cruising speed characteristics as gasoline. It does yield a somewhat reduced driving range, however, because it contains only about 70-75 percent of the energy content of gasoline. Its high octane rating (around 105) means, though, that an LPG engine's power output and fuel efficiency can be increased beyond what would be possible with a gasoline engine without causing destructive "knocking." Such fine-tuning can help compensate for the fuel's lower energy density. Fleet owners find that propane costs are typically 5 to 30 percent less than those of gasoline. The cost of constructing an LPG fueling station is also similar to that of a comparably sized gasoline dispensing system. Fleet owners not wishing to establish fueling stations of their own may avail themselves of over 3,000 publicly accessible fueling stations nationwide (SCAQMD 2016).

Propane is an odorless, nonpoisonous gas that has the lowest flammability range of all alternative fuels. High concentrations of propane can displace oxygen in the air, though, causing the potential for asphyxiation. Ethyl mercaptan is an odorant that is typically added to propane to warn of the presence of gas. While LPG itself does not irritate the skin, the liquefied gas becomes very cold upon escaping from a high-pressure tank, and may cause frostbite, should it contact unprotected skin. One of the main dangers with LPG is that it is highly flammable. As with gasoline, LPG can form explosive mixtures with air. Since the gas is slightly heavier than air, it may form a continuous stream that stretches a considerable distance from a leak or open container, which may lead to a flashback explosion upon contacting a source of ignition (U.S. DOE, 2003).

While LPG is classified as a fire hazard, it is not classified as a toxic or as a hazardous air pollutant. LPG is a regulated substance subject to both the California and Federal RMP programs in accordance with the CCR, Title 19, §2770.4.1 and Chapter 40 of the CFR Part 68, §68.1263. A RMP is a document prepared by the owner or operator of a stationary source containing detailed information including, but not limited to:

- Regulated substances held onsite at the stationary source;
- Offsite consequences of an accidental release of a regulated substance;
- The accident history at the stationary source;
- The emergency response program for the stationary source;
- Coordination with local emergency responders;

- Hazard review or process hazard analysis;
- Operating procedures at the stationary source;
- Training of the stationary source's personnel;
- Maintenance and mechanical integrity of the stationary source's physical plant; and
- Incident investigation.

The threshold quantity for LPG (as propane) as a regulated substance for accidental release prevention is 10,000 pounds. However, when LPG is used as a fuel by an end user (as is frequently the case with residential portable and stationary storage tanks), or when it is held for retail sale as a fuel, it is excluded from these RMP requirements, even if the amount exceeds the threshold quantity.

With respect to suppliers and sellers of LPG, Health and Safety Code §25506 specifically requires all businesses handling hazardous materials to submit a business emergency response plan to assist local administering agencies in the emergency release or threatened release of a hazardous material. Business emergency response plans generally require the following:

1. Identification of individuals who are responsible for various actions, including reporting, assisting emergency response personnel and establishing an emergency response team;

2. Procedures to notify the administering agency, the appropriate local emergency rescue personnel, and the California Office of Emergency Services;

3. Procedures to mitigate a release or threatened release to minimize any potential harm or damage to persons, property or the environment;

4. Procedures to notify the necessary persons who can respond to an emergency within the facility;

5. Details of evacuation plans and procedures;

6. Descriptions of the emergency equipment available in the facility;

7. Identification of local emergency medical assistance; and

8. Training (initial and refresher) programs for employees in: (a) The safe handling of hazardous materials used by the business; (b) Methods of working with the local public emergency response agencies; (c) The use of emergency response resources under control of the handler; and (d) Other procedures and resources that will increase public safety and prevent or mitigate a release of hazardous materials.

In general, every county or city and all facilities using a minimum amount of hazardous materials are required to formulate detailed contingency plans to eliminate, or at least minimize, the possibility and effect of fires, explosion, or spills. In conjunction with the California Office of Emergency Services, local jurisdictions have enacted ordinances that set standards for area and business emergency response plans. These requirements include immediate notification, mitigation of an actual or threatened release of a hazardous material, and evacuation of the emergency area. Lastly, operators who currently transfer and dispense LPG are well aware of the hazardous nature of LPG, including its flammability and receive periodic training for the safe handling of LPG for the following reasons. Facility operators with a dispensing system for LPG are required to comply with operating pressures pursuant to the standards developed by the American Society of Mechanical Engineers (ASME) Pressure Vessel Code, Section 8; NFPA 58 with regard to venting LPG to the atmosphere; and for LPG tanks that are subject to RMP requirements, the operators must obtain permits from, and submit RMPs to the local Certified Unified Program Agency (CUPA) with is typically the city or county fire department. For similar reasons, industrial and commercial customers on the receiving end of LPG deliveries are also well aware of the safety issues associated with LPG. Residential customers, through warning labels on the portable cylinders and on the units to which the portable cylinders connect, are notified of the flammability dangers associated with LPG.

3.4.2.2.3 Biofuels/Renewable Fuels

Biofuel is a fuel derived from biological sources such as vegetable oils or animal fats. The process for creating biodiesel involves mixing the oil with alcohol (e.g., methanol or ethanol) in the presence of a chemical such as sodium hydroxide. This process produces a methyl ester if methanol is used or an ethyl ester if ethanol is used. Methyl ester from soy beans is more economical to produce, and, therefore, is more common in the U.S. Biodiesel can be used pure (B100) or blended with conventional diesel. The most common blended biodiesel is B20, which is 20 percent biodiesel and 80 percent conventional diesel.

Renewable fuel is produced from non-petroleum renewable resources but is not a mono-alkyl ester. There are several different chemical approaches to producing renewable diesel. One is based on hydrotreating vegetable oils or animal fats. Hydrotreating frequently takes place in conventional refineries to reduce sulfur or aromatic hydrocarbon content in ARB diesel. A second method involves synthesis of hydrocarbons through enzymatic reactions. A third method involves partially combusting a biomass source to produce carbon monoxide and hydrogen (syngas) and utilizing the Fischer-Tropsch reaction to produce complex hydrocarbons. Compared to biodiesel, renewable diesel uses similar feedstocks but has different processing methods and can include chemically different components. Renewable diesel can be used pure (R100) or blended with conventional diesel. The most common blended renewable diesel is R20, which is 20 percent renewable diesel and 80 percent conventional diesel.

Biomass is renewable biological material, primarily plant matter or products derived from plant matter. Sources of biomass include stalks and leaves of corn and other crops, treelimbs or vegetation removed to reduce forest fire hazards, wood chips or sawdust from lumber and paper processing, municipal solid waste (e.g., discarded wood or paper products, yard trimmings, food scraps, etc.), and grassy or woody crops grown specifically for biofuels production. Bio-fuel is a generic term for transport fuel that can be produced from renewable material of plant or animals origin and are substitutes or partial substitutes for fossil, (or mineral) fuels. Biofuels are liquid, solid, or gaseous fuels derived from renewable biological sources. Biomass can be burned directly for thermal energy or converted to other high-value energy sources including ethanol, biodiesel, methanol, hydrogen or methane (U.S. DOE, 2008).

Biodiesel is renewable, biodegradable fuel manufactured domestically from vegetable oils, animal fats, or recycled restaurant grease. It is a cleaner burning replacement for petroleum diesel fuel (U.S. DOE, 2016). A blend of 20 percent biodiesel with 80 percent petroleum diesel is known as B20. B2 and B5 blends are also commonly used, especially in the trucking industry to benefit engine performance. Pure biodiesel, B100, is also manufactured but not as readily consumed due to challenges in storing and sensitivity to cold weather. Biodiesel use in the United States has increased significantly over the past 15 years. In 2010, biodiesel consumption was about 263 million gallons per year, which spiked to 887 million gallons per year in 2011. Consumption remained similar in 2012 before increasing again to nearly 1.4 billion gallons per year in both 2013 and 2014 (U.S. EIA, 2015).

3.4.2.2.4 Electric/Hybrid

Electric (EVs) and hybrid vehicles (hybrids) both use electricity as part of their fuel system. EVs rely purely on electric power stored in batteries. Hybrids also use batteries as part of their fuel supply; however, hybrids supplement their electric demand by using gasoline engines to generate either mechanical or electric power on demand. Since gasoline is a conventional fuel, any difference in hazards associated with hybrid vehicles would be from the batteries. The most common battery technologies used in modern EVs and hybrids are nickel-metal hydride (NiMH) and lithium ion (Li-ion) (AFDC, 2016a).

Between March 2011 and July 2015 more than 146,000 electric vehicles were sold in California, with about 2,248 public charging stations operating throughout California (CEC, 2016d). The 2017 Air Plan, the Plan Bay Area, as well as ARB's SIP strategy are expected to encourage the use of additional electric vehicles. Therefore, these actions are expected to continue with or without approval of the 2017 Plan.

3.4.3 REGULATORY SETTING

There are many federal and state rules and regulations for handling hazardous materials, which serve to minimize the potential impacts associated with hazards.

3.4.3.2 Federal Regulations

The U.S. EPA is the primary federal agency charged with protecting human health and with safeguarding the natural environment from pollution into air, water, and land. The U.S. EPA works to develop and enforce regulations that implement environmental laws enacted by Congress. The U.S. EPA is responsible for researching and setting national standards for a variety of environmental programs, and delegates to states and Indian tribes the responsibility for issuing permits and for monitoring and enforcing compliance. Since 1970, Congress has enacted numerous environmental laws that pertain to hazardous materials, for the U.S. EPA to implement as well as to other agencies at the federal, state and local level, as described in the following subsections.

3.4.3.2.1 Hazardous Materials and Waste Regulations

Resource Conservation and Recovery Act: The Resource Conservation and Recovery Act (RCRA) of 1976 authorizes the U.S. EPA to control the generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA considers materials and waste to be hazardous based on four characteristics: ignitability, corrosivity, reactivity, and toxicity. Under RCRA regulations, hazardous wastes must be tracked from the time of generation to the point of disposal. In 1984, RCRA was amended with addition of the Hazardous and Solid Waste Amendments, which authorized increased enforcement by the U.S. EPA, stricter hazardous waste standards, and a comprehensive underground storage tank program. Likewise, the Hazardous and Solid Waste Amendments focused on waste reduction and corrective action for hazardous releases. The use of certain techniques for the disposal of some hazardous wastes was specifically prohibited by the Hazardous and Solid Waste Amendments. Individual states may implement their own hazardous waste programs under RCRA, with approval by the U.S. EPA. California has been delegated authority to operate its own hazardous waste management program.

Comprehensive Environmental Response, Compensation and Liability Act: The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), which is often commonly referred to as Superfund, is a federal statute that was enacted in 1980 to address abandoned sites containing hazardous waste and/or contamination. CERCLA was amended in 1986 by the Superfund Amendments and Reauthorization Act, and by the Small Business Liability Relief and Brownfields Revitalization Act of 2002.

CERCLA contains prohibitions and requirements concerning closed and abandoned hazardous waste sites; establishes liability of persons responsible for releases of hazardous waste at these sites; and establishes a trust fund to provide for cleanup when no responsible party can be identified. The trust fund is funded largely by a tax on the chemical and petroleum industries. CERCLA also provides federal jurisdiction to respond directly to releases or impending releases of hazardous substances that may endanger public health or the environment.

CERCLA also enabled the revision of the National Contingency Plan (NCP) which provided the guidelines and procedures needed to respond to releases and threatened releases of hazardous substances, pollutants, or contaminants. The NCP also established the National Priorities List, which identifies hazardous waste sites eligible for long-term remedial action financed under the federal Superfund program.

Prevention of Accidental Releases and Risk Management Programs: Requirements pertaining to the prevention of accidental releases are promulgated in §112 (r) of the CAA Amendments of 1990 [42 U.S.C. §7401 et. seq.]. The objective of these requirements was to prevent the accidental release and to minimize the consequences of any such release of a hazardous substance. Under these provisions, facilities that produce, process, handle or store hazardous substance have a duty to: 1) identify hazards which may result from releases using hazard assessment techniques; 2) design and maintain a safe facility and take steps necessary to prevent releases; and, 3) minimize the consequence of accidental releases that occur.

In accordance with the requirements in §112 (r), U.S. EPA adopted implementing guidelines in 40 CFR Part 68. Under this part, stationary sources with more than a threshold quantity of a regulated substance shall be evaluated to determine the potential for and impacts of accidental releases from any processes subject to the federal risk management requirements. Under certain conditions, the owner or operator of a stationary source may be required to develop and submit a Risk Management Plan (RMP). RMPs consist of three main elements: a hazard assessment that includes off-site consequences analyses and a five-year accident history, a prevention program, and an emergency response program. At the local level, RMPs are implemented by the local fire departments.

3.4.3.2.2 Emergency Planning and Community Right-to-Know Act

The Emergency Planning and Community Right-to-Know Act (EPCRA) is a federal law adopted by Congress in 1986 that is designed to help communities plan for emergencies involving hazardous substances. EPCRA establishes requirements for federal, state and local governments, Indian tribes, and industry regarding emergency planning and "Community Right-to-Know" reporting on hazardous and toxic chemicals. The Community Right-to-Know provisions help increase the public's knowledge and access to information on chemicals at individual facilities, their uses, and releases into the environment. States and communities, working with facilities, can use the information to improve chemical safety and protect public health and the environment. There are four major provisions of EPCRA:

1. Emergency Planning (§§301 – 303) requires local governments to prepare chemical emergency response plans, and to review plans at least annually. These sections also require state governments to oversee and coordinate local planning efforts. Facilities that maintain Extremely Hazardous Substances (EHS) onsite (see 40 CFR Part 355 for the list of EHS chemicals) in quantities greater than corresponding “Threshold Planning Quantities” must cooperate in the preparation of the emergency plan.

2. Emergency Release Notification (§304) requires facilities to immediately report accidental releases of EHS chemicals and hazardous substances in quantities greater than corresponding Reportable Quantities (RQs) as defined under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) to state and local officials. Information about accidental chemical releases must be made available to the public.

3. Hazardous Chemical Storage Reporting (§§311 – 312) requires facilities that manufacture, process, or store designated hazardous chemicals to make Safety Data Sheets (SDSs, formerly referred to as material safety data sheets or MSDSs) describing the properties and health effects of these chemicals available to state and local officials and local fire departments. These sections also require facilities to report to state and local officials and local fire departments, inventories of all onsite chemicals for which SDSs exist. Lastly, information about chemical inventories at facilities and SDSs must be available to the public.

4. Toxic Chemical Release Inventory (§313) requires facilities to annually complete and submit a Toxic Chemical Release Inventory Form for each Toxic Release Inventory (TRI) chemical that are manufactured or otherwise used above the applicable threshold quantities.

Implementation of EPCRA has been delegated to the State of California. The California Emergency Management Agency requires facilities to develop a Hazardous Materials Business Plan if they handle hazardous materials in quantities equal to or greater than 55 gallons, 500 pounds, or 200 cubic feet of gas or extremely hazardous substances above the threshold planning quantity. The Hazardous Materials Business Plan is provided to state and local emergency response agencies and includes inventories of hazardous materials, an emergency plan, and implements a training program for employees.

3.4.3.2.3 Hazardous Materials Transportation Act

The Hazardous Material Transportation Act (HMTA), adopted in 1975 (see 49 U.S.C. §§5101 – 5127), gave the Secretary of Transportation the regulatory and enforcement authority to provide adequate protection against the risks to life and property inherent in the transportation of hazardous material in commerce. The U.S. DOT (see 49 CFR Parts 171-180) oversees the movement of hazardous materials at the federal level. The HMTA requires that carriers report accidental releases of hazardous materials to U.S. DOT at the earliest practical moment. Other incidents that must be reported include deaths, injuries requiring hospitalization, and property damage exceeding $50,000. The hazardous material regulations also contain emergency response provisions which include incident reporting requirements. Reports of major incidents go to the National Response Center, which in turn is linked with CHEMTREC, a public service hotline established by the chemical manufacturing industry for emergency responders to obtain information and assistance for emergency incidents involving chemicals and hazardous materials.

Hazardous materials regulations are implemented by the Research and Special Programs Administration (RSPA) branch of the U.S. DOT. The regulations cover the definition and classification of hazardous materials, communication of hazards to workers and the public, packaging and labeling requirements, operational rules for shippers, and training. These regulations apply to interstate, intrastate, and foreign commerce by air, rail, ships, and motor vehicles, and also cover hazardous waste shipments. The Federal Aviation Administration Office of Hazardous Materials Safety is responsible for overseeing the safe handling of hazardous materials aboard aircraft. The Federal Railroad Administration oversees the transportation of hazardous materials by rail. The U.S. Coast Guard regulates the bulk transport of hazardous materials by sea. The Federal Highway Administration (FHWA) is responsible for highway routing of hazardous materials and issuing highway safety permits.

3.4.3.2.4 Toxic Substances Control Act

The Toxic Substances Control Act (TSCA) was enacted by Congress in 1976 (see 15 U.S.C. §2601 et seq.) and gave the U.S. EPA the authority to protect the public from unreasonable risk of injury to health or the environment by regulating the manufacture, sale, and use of chemicals currently produced or imported into the United States. The TSCA, however, does not address wastes produced as byproducts of manufacturing. The types of chemicals regulated by the act fall into two categories: existing and new. New chemicals are defined as "any chemical substance which is not included in the chemical substance list compiled and published under [TSCA] section 8(b)." This list included all of chemical substances manufactured or imported into the U.S. prior to December 1979. Existing chemicals include any chemical currently listed under section 8 (b). The distinction between existing and new chemicals is necessary as the act regulates each category of chemicals in different ways. The U.S. EPA repeatedly screens both new and existing chemicals and can require reporting or testing of those that may pose an environmental or human-health hazard. The U.S. EPA can ban the manufacture and import of those chemicals that pose an unreasonable risk.

3.4.3.2.5 Hazardous Material Worker and Public Safety Requirements

Occupational Safety and Health Administration Regulations: The federal Occupational Safety and Health Administration (OSHA) is an agency of the United States Department of Labor that was created by Congress under the Occupational Safety and Health Act in 1970. OSHA is the agency responsible for assuring worker safety in the handling and use of chemicals in the workplace. Under the authority of the Occupational Safety and Health Act of 1970, OSHA has adopted numerous regulations pertaining to worker safety (see 29 CFR Part 1910). These regulations set standards for safe workplaces and work practices, including the reporting of accidents and occupational injuries. Some OSHA regulations contain standards relating to hazardous materials handling to protect workers who handle toxic, flammable, reactive, or explosive materials, including workplace conditions, employee protection requirements, first aid, and fire protection, as well as material handling and storage. For example, facilities which use, store, manufacture, handle, process, or move hazardous materials are required to conduct employee safety training, have available and know how to use safety equipment, prepare illness prevention programs, provide hazardous substance exposure warnings, prepare emergency response plans, and prepare a fire prevention plan.

Procedures and standards for safe handling, storage, operation, remediation, and emergency response activities involving hazardous materials and waste are promulgated in 29 CFR Part 1910, Subpart H. Some key subsections in 29 CFR Part 1910, Subpart H are §1910.106 - Flammable Liquids and §1910.120 - Hazardous Waste Operations and Emergency Response. In particular, the Hazardous Waste Operations and Emergency Response regulations contain requirements for worker training programs, medical surveillance for workers engaging in the handling of hazardous materials or wastes, and waste site emergency and remediation planning, for those who are engaged in specific clean-up, corrective action, hazardous material handling, and emergency response activities (see 29 CFR Part 1910 Subpart H, §1910.120 (a)(1)(i-v) and §1926.65 (a)(1)(i-v)).

Process Safety Management: As part of the numerous regulations pertaining to worker safety adopted by OSHA, specific requirements that pertain to Process Safety Management (PSM) of Highly Hazardous Chemicals were adopted in 29 CFR Part 1910 Subpart H, §1910.119 and 8 CCR §5189 to protect workers at facilities that have toxic, flammable, reactive or explosive materials. PSM program elements are aimed at preventing or minimizing the consequences of catastrophic releases of chemicals and include process hazard analyses, formal training programs for employees and contractors, investigation of equipment mechanical integrity, and an emergency response plan. Specifically, the PSM program requires facilities that use, store, manufacture, handle, process, or move hazardous materials to conduct employee safety training; have an inventory of safety equipment relevant to potential hazards; have knowledge on use of the safety equipment; prepare an illness prevention program; provide hazardous substance exposure warnings; prepare an emergency response plan; and prepare a fire prevention plan.

Emergency Action Plan: An Emergency Action Plan (EAP) is a written document required by OSHA standards promulgated in 29 CFR Part 1910, Subpart E, §1910.38 (a) to facilitate and organize a safe employer and employee response during workplace emergencies. An EAP is required by all that are required to have fire extinguishers. At a minimum, an EAP must include the following: 1) a means of reporting fires and other emergencies; 2) evacuation procedures and emergency escape route assignments; 3) procedures to be followed by employees who remain to operate critical plant operations before they evacuate; 4) procedures to account for all employees after an emergency evacuation has been completed; 5) rescue and medical duties for those employees who are to perform them; and, 6) names or job titles of persons who can be contacted for further information or explanation of duties under the plan.

National Fire Regulations: The National Fire Codes (NFC), Title 45, published by the National Fire Protection Association (NFPA) contains standards for laboratories using chemicals, which are not requirements, but are generally employed by organizations in order to protect workers. These standards provide basic protection of life and property in laboratory work areas through prevention and control of fires and explosions, and also serve to protect personnel from exposure to non-fire health hazards.

In addition to the NFC, the NFPA adopted a hazard rating system which is promulgated in NFPA 704 - Standard System for the Identification of the Hazards of Materials for Emergency Response. NFPA 704 is a "standard (that) provides a readily recognized, easily understood system for identifying specific hazards and their severity using spatial, visual, and numerical methods to describe in simple terms the relative hazards of a material. It addresses the health, flammability, instability, and related hazards that may be presented as short-term, acute exposures that are most likely to occur as a result of fire, spill, or similar emergency." In addition, the hazard ratings per NFPA 704 are used by emergency personnel to quickly and easily identify the risks posed by nearby hazardous materials in order to help determine what, if any, specialty equipment should be used, procedures followed, or precautions taken during the first moments of an emergency response. The scale is divided into four color-coded categories, with blue indicating level of health hazard, red indicating the flammability hazard, yellow indicating the chemical reactivity, and white containing special codes for unique hazards such as corrosivity and radioactivity. Each hazard category is rated on a scale from 0 (no hazard; normal substance) to 4 (extreme risk). Table 3.4-3 summarizes what the codes mean for each hazards category.

In addition to the information in Table 3.4-3, a number of other physical or chemical properties may cause a substance to be a fire hazard. With respect to determining whether any substance is classified as a fire hazard, SDS lists the NFPA 704 flammability hazard ratings (e.g., NFPA

704). NFPA 704 is a standard that provides a readily recognized, easily understood system for identifying flammability hazards and their severity using spatial, visual, and numerical methods to describe in simple terms the relative flammability hazards of a material.

TABLE 3.4-3
NFPA 704 Hazards Rating Code

Hazard Rating Code	Health (Blue)	Flammability (Red)	Reactivity (Yellow)	Special (White)
4 = Extreme	Very short exposure could cause death or major residual injury (extreme hazard).	Will rapidly or completely vaporize at normal atmospheric pressure and temperature, or is readily dispersed in air and will burn readily. Flash point below 73°F.	Readily capable of detonation or explosive decomposition at normal temperatures and pressures.	W = Reacts with water in an unusual or dangerous manner.
3 = High	Short exposure could cause serious temporary or moderate residual injury.	Liquids and solids that can be ignited under almost all ambient temperature conditions. Flash point between 73°F and 100°F.	Capable of detonation or explosive decomposition but requires a strong initiating source, must be heated under confinement before initiation, reacts explosively with water, or will detonate if severely shocked.	**OXY** = Oxidizer
2 = Moderate	Intense or continued but not chronic exposure could cause temporary incapacitation or possible residual injury.	Must be moderately heated or exposed to relatively high ambient temperature before ignition can occur. Flash point between 100°F and 200°F.	Undergoes violent chemical change at elevated temperatures and pressures, reacts violently with water, or may form explosive mixtures with water.	**SA** = Simple asphyxiant gas (includes nitrogen, helium, neon, argon, krypton, and xenon).
1 = Slight	Exposure would cause irritation with only minor residual injury.	Must be heated before ignition can occur. Flash point over 200°F.	Normally stable, but can become unstable at elevated temperatures and pressures.	Not applicable
0 = Insignificant	Poses no health hazard, no precautions necessary.	Will not burn.	Normally stable, even under fire exposure conditions, and is not reactive with water.	Not applicable

Although substances can have the same NFPA 704 Flammability Ratings Code, other factors can make each substance's fire hazard very different from each other. For this reason, additional chemical characteristics, such as auto-ignition temperature, boiling point, evaporation rate, flash point, lower explosive limit (LEL), upper explosive limit (UEL), and vapor pressure, are also considered when determining whether a substance is fire hazard. The following is a brief description of each of these chemical characteristics.

Auto-ignition Temperature: The auto-ignition temperature of a substance is the lowest temperature at which it will spontaneously ignite in a normal atmosphere without an external source of ignition, such as a flame or spark.

Boiling Point: The boiling point of a substance is the temperature at which the vapor pressure of the liquid equals the environmental pressure surrounding the liquid. Boiling is a process in which molecules anywhere in the liquid escape, resulting in the formation of vapor bubbles within the liquid.

Evaporation Rate: Evaporation rate is the rate at which a material will vaporize (evaporate, change from liquid to a vapor) compared to the rate of vaporization of a specific known material. This quantity is a represented as a unit less ratio. For example, a substance with a high evaporation rate will readily form a vapor which can be inhaled or explode, and thus have a higher hazard risk. Evaporation rates generally have an inverse relationship to boiling points (i.e., the higher the boiling point, the lower the rate of evaporation).

Flash Point: Flash point is the lowest temperature at which a volatile liquid can vaporize to form an ignitable mixture in air. Measuring a liquid's flash point requires an ignition source. At the flash point, the vapor may cease to burn when the source of ignition is removed. There are different methods that can be used to determine the flashpoint of a solvent but the most frequently used method is the Tagliabue Closed Cup standard (ASTM D56), also known as the TCC. The flashpoint is determined by a TCC laboratory device which is used to determine the flash point of mobile petroleum liquids with flash point temperatures below 175 degrees Fahrenheit (79.4 degrees Centigrade).

Flash point is a particularly important measure of the fire hazard of a substance. For example, the Consumer Products Safety Commission (CPSC) promulgated Labeling and Banning Requirements for Chemicals and Other Hazardous Substances in 15 U.S.C. §1261 and 16 CFR Part 1500. Per the CPSC, the flammability of a product is defined in 16 CFR Part 1500.3 (c)(6) and is based on flash point. For example, a liquid needs to be labeled as: 1) “Extremely Flammable” if the flash point is below 20 degrees Fahrenheit; 2) “Flammable” if the flash point is above 20 degrees Fahrenheit but less than 100 degrees Fahrenheit; or, 3) “Combustible” if the flash point is above 100 degrees Fahrenheit up to and including 150 degrees Fahrenheit.

Lower Explosive Limit (LEL): The lower explosive limit of a gas or a vapor is the limiting concentration (in air) that is needed for the gas to ignite and explode or the lowest concentration (percentage) of a gas or a vapor in air capable of producing a flash of fire in presence of an ignition source (e.g., arc, flame, or heat). If the concentration of a substance in air is below the LEL, there is not enough fuel to continue an explosion. In other words, concentrations lower than the LEL are "too lean" to burn. For example, methane gas has a LEL of 4.4 percent (at 138 degrees Centigrade) by volume, meaning 4.4 percent of the total volume of the air consists of methane. At 20 degrees Centigrade, the LEL for methane is 5.1 percent by volume. If the atmosphere has less that 5.1 percent methane, an explosion cannot occur even if a source of ignition is present. When the concentration of methane reaches 5.1 percent, an explosion can occur if there is an ignition source.

Upper Explosive Limit (UEL): The upper explosive limit of a gas or a vapor is the highest concentration (percentage) of a gas or a vapor in air capable of producing a flash of fire in presence of an ignition source (e.g., arc, flame, or heat). Concentrations of a substance in air above the UEL are "too rich" to burn.

Vapor Pressure: Vapor pressure is an indicator of a chemical's tendency to evaporate into gaseous form.

Health Hazards Guidance: In addition to fire impacts, health hazards can also be generated due to exposure of chemicals present in both conventional as well as reformulated products. Using available toxicological information to evaluate potential human health impacts associated with conventional solvents and potential replacement solvents, the toxicity of the conventional solvents can be compared to solvents expected to be used in reformulated products. As a measure of a chemical's potential health hazards, the following values need to be considered: the Threshold Limit Values established by the American Conference of Governmental Industrial Hygiene, OSHA's Permissible Exposure Limits, the Immediately Dangerous to Life and Health levels recommended by the National Institute for Occupational Safety and Health (NIOSH), and health hazards developed by the National Safety Council. The following is a brief description of each of these values.

Threshold Limit Values (TLVs): The TLV of a chemical substance is a level to which it is believed a worker can be exposed day after day for a working lifetime without adverse health effects. The TLV is an estimate based on the known toxicity in humans or animals of a given chemical substance, and the reliability and accuracy of the latest sampling and analytical methods. The TLV for chemical substances is defined as a concentration in air, typically for inhalation or skin exposure. Its units are in parts per million (ppm) for gases and in milligrams per cubic meter (mg/m^3) for particulates. The TLV is a recommended guideline by ACGIH.

Permissible Exposure Limits (PEL): The PEL is a legal limit, usually expressed in ppm, established by OSHA to protect workers against the health effects of exposure to hazardous substances. PELs are regulatory limits on the amount or concentration of a substance in the air. A PEL is usually given as a time-weighted average (TWA), although some are short-term exposure limits (STEL) or ceiling limits. A TWA is the average exposure over a specified period of time, usually eight hours. This means that, for limited periods, a worker may be exposed to concentrations higher than the PEL, so long as the average concentration over eight hours remains lower. A short-term exposure limit is one that addresses the average exposure over a 15 to 30 minute period of maximum exposure during a single work shift. A ceiling limit is one that may not be exceeded for any period of time, and is applied to irritants and other materials that have immediate effects. The OSHA PELs are published in 29 CFR 1910.1000, Table Z1.

Immediately Dangerous to Life and Health (IDLH): IDLH is an acronym defined by NIOSH as exposure to airborne contaminants that is "likely to cause death or immediate or delayed permanent adverse health effects or prevent escape from such an environment." IDLH values are often used to guide the selection of breathing apparatus that are made available to workers or firefighters in specific situations.

3.4.3.2.6 Oil and Pipeline Regulations and Oversight

Oil Pollution Act: The Oil Pollution Act was signed into law in 1990 to give the federal government authority to better respond to oil spills. The Oil Pollution Act improved the federal government's ability to prevent and respond to oil spills, including provision of money and resources. The Oil Pollution Act establishes polluter liability, gives states enforcement rights in navigable waters of the state, mandates the development of spill control and response plans for all vessels and facilities, increases fines and enforcement mechanisms, and establishes a federal trust fund for financing clean-up.

The Oil Pollution Act also establishes the National Oil Spill Liability Trust Fund to provide financing for cases in which the responsible party is either not readily identifiable, or refuses to pay the cleanup/damage costs. In addition, the Oil Pollution Act expands provisions of the National Oil and Hazardous Substances Pollution Contingency Plan, more commonly called the National Contingency Plan, requiring the federal government to direct all public and private oil spill response efforts. It also requires area committees, composed of federal, state, and local government officials, to develop detailed, location-specific area contingency plans. In addition, the Oil Pollution Act directs owners and operators of vessels, and certain facilities that pose a serious threat to the environment, to prepare their own specific facility response plans. The Oil Pollution Act increases penalties for regulatory non-compliance by responsible parties; gives the federal government broad enforcement authority; and provides individual states the authority to establish their own laws governing oil spills, prevention measures, and response methods.

Oil Pollution Prevention Regulation: In 1973, the USEPA issued the Oil Pollution Prevention regulation (see 40 CFR 112)**,** to address the oil spill prevention provisions contained in the Clean Water Act of 1972. The Spill Prevention, Control, and Countermeasure (SPCC) Rule is part of the Oil Pollution Prevention regulations (see 40 CFR Part 112, Subparts A - C). Specifically, the SPCC rule includes requirements for oil spill prevention, preparedness, and response to prevent oil discharges to navigable waters and adjoining shorelines. The rule requires specific facilities to prepare, amend, and implement SPCC Plans. SPCC Plans require applicable facilities to take steps to prevent oil spills including: 1) using suitable storage containers/tanks; 2) providing overfill prevention (e.g., high-level alarms); 3) providing secondary containment for bulk storage tanks; 4) providing secondary containment to catch oil spills during transfer activities; and, 5) periodically inspecting and testing pipes and containers.

U.S. Department of Transportation, Office of Pipeline Safety: The Office of Pipeline Safety, within the U.S. DOT, Pipeline and Hazards Material Safety Administration, has jurisdictional responsibility for developing regulations and standards to ensure the safe and secure movement of hazardous liquid and gas pipelines under its jurisdiction in the United States. The Office of Pipeline Safety has the following key responsibilities:

- Support the operation of, and coordinate with the United States Coast Guard on the National Response Center and serve as a liaison with the Department of Homeland Security and the Federal Emergency Management Agency on matters involving pipeline safety;

- Develop and maintain partnerships with other federal, state, and local agencies, public interest groups, tribal governments, and the regulated industry and other underground utilities to address threats to pipeline integrity, service, and reliability and to share responsibility for the safety of communities;

- Administer pipeline safety regulatory programs and develops regulatory policy involving pipeline safety;

- Oversee pipeline operator implementation of risk management and risk-based programs and administer a national pipeline inspection and enforcement program;

- Provide technical and resource assistance for state pipeline safety programs to ensure oversight of intrastate pipeline systems and educational programs at the local level; and,

- Support the development and conduct of pipeline safety training programs for federal and state regulatory and compliance staff and the pipeline industry.

49 CFR Parts 178 – 185 relates to the role of transportation, including pipelines, in the United States. 49 CFR Parts 186-199 establishes minimum pipeline safety standards. The Office of the State Fire Marshal works in partnership with the Federal Pipeline and Hazardous Materials Safety Administration to assure pipeline operators are meeting requirements for safe, reliable, and environmentally sound operation of their facilities for intrastate pipelines within California.

Chemical Facility Anti-Terrorism Standards: The Federal Department of Homeland Security established the chemical facility anti-terrorism standards in 2007 (see 6 CFR Part 27). These regulations established risk-based performance standards for the security of chemical facilities and require covered chemical facilities to prepare Security Vulnerability Assessments, which identify facility security vulnerabilities, and to develop and implement security plans.

3.4.3.3 State Regulations

California Hazardous Waste Control Law: The California Hazardous Waste Control Law is administered by the California Environmental Protection Agency (CalEPA) to regulate hazardous wastes within the State of California. While the California Hazardous Waste Control Law is generally more stringent than RCRA, both the state and federal laws apply in California. The California Department of Toxic Substances Control (DTSC) is the primary agency in charge of enforcing both the federal and state hazardous materials laws in California. The DTSC regulates hazardous waste, oversees the cleanup of existing contamination, and pursues avenues to reduce hazardous waste produced in California. The DTSC regulates hazardous waste in California under the authority of RCRA, the California Hazardous Waste Control Law, and the California Health and Safety Code. Under the direction of the CalEPA, the DTSC maintains the Cortese List and Envirostor databases of hazardous materials and waste sites as specified under Government Code §65962.5.

The Hazardous Waste Control Law (22 CCR Chapter 11, Appendix X) also lists 791 chemicals and approximately 300 common materials which may be hazardous; establishes criteria for identifying, packaging, and labeling hazardous wastes; prescribes management controls; establishes permit requirements for treatment, storage, disposal, and transportation; and identifies some wastes that cannot be disposed of in landfills.

California Occupational Safety and Health Administration: The California Occupational Safety and Health Administration (CalOSHA) is the primary agency responsible for worker safety in the handling and use of chemicals in the workplace. The CalOSHA requires the employer to monitor worker exposure to listed hazardous substances and notify workers of exposure (8 CCR Sections 337-340). The regulations specify requirements for employee training, availability of safety equipment, accident-prevention programs, and hazardous substance exposure warnings. CalOSHA standards are generally more stringent than federal regulations.

Hazardous Materials Release Notification: Many state statutes require emergency notification of a hazardous chemical release, including:

- California Health and Safety Code §25270.7, §25270.8, and §25507;
- California Vehicle Code §23112.5;
- California Public Utilities Code §7673 (General Orders #22-B, 161);
- California Government Code §51018 and §8670.25.5(a);
- California Water Code §13271 and §13272; and,
- California Labor Code §6409.1(b)10.

California Accident Release Prevention (CalARP) Program: The California Accident Release Prevention Program (19 CCR Division 2, Chapter 4.5) requires the preparation of RMPs. CalARP requires stationary sources with more than a threshold quantity of a regulated substance to be evaluated to determine the potential for and impacts of accidental releases from any processes onsite (not transport) subject to state risk management requirements. RMPs are documents prepared by the owner or operator of a stationary source containing detailed information including: (1) regulated substances held onsite at the stationary source; (2) offsite consequences of an accidental release of a regulated substance; (3) the accident history at the stationary source; (4) the emergency response program for the stationary source; (5) coordination with local emergency responders; (6) hazard review or process hazard analysis; (7) operating procedures at the stationary source; (8) training of the stationary source's personnel; (9) maintenance and mechanical integrity of the stationary source's physical plant; and (10) incident investigation. The CalARP program is implemented at the local government level by Certified Unified Program Agencies (CUPAs) also known as Administering Agencies (AAs). Typically, local fire departments are the administering agencies of the CalARP program because they frequently are the first responders in the event of a release. California is proposing modifications to the CalARP Program along with the state's PSM program in response to an accident at the Chevron Richmond Refinery. The proposed regulations were released for public comment on July 15, 2016 and the public comment period closes on September 15, 2016.

Hazardous Materials Disclosure Program: The Unified Hazardous Waste and Hazardous Materials Management Regulatory Program (Unified Program) as promulgated by CalEPA in CCR, Title 27, Chapter 6.11 requires the administrative consolidation of six hazardous materials and waste programs (program elements) under one agency, a CUPA. The Unified Program administered by the State of California consolidates, coordinates, and makes consistent the administrative requirements, permits, inspections, and enforcement activities for the state's environmental and emergency management programs, which include Hazardous Waste Generator and Onsite Hazardous Waste Treatment Programs ("Tiered Permitting"); Above ground SPCC Program; Hazardous Materials Release Response Plans and Inventories (business plans); the CalARP Program; the UST Program; and the Uniform Fire Code Plans and Inventory Requirements. The Unified Program is implemented at the local government level by CUPAs.

Hazardous Materials Management Act: The State of California (California Health and Safety Code Division 20, Chapter 6.95) requires any business that handles more than a specified amount of hazardous or extremely hazardous materials, termed a "reportable quantity," to submit a Hazardous Materials Business Plan to its Certified Unified Program Agency. Business plans must include an inventory of the types, quantities, and locations of hazardous materials at the facility. Businesses are required to update their business plans at least once every three years and the chemical portion of their plans every year. Also, business plans must include emergency response plans and procedures to be used in the event of a significant or threatened significant release of a hazardous material. These plans need to identify the procedures to follow for immediate notification to all appropriate agencies and personnel of a release, identification of local emergency medical assistance appropriate for potential accident scenarios, contact information for all company emergency coordinators, a listing and location of emergency equipment at the business, an evacuation plan, and a training program for business personnel. The requirements for hazardous materials business plans are specified in the California Health and Safety Code and 19 CCR.

Hazardous Materials Transportation in California: California regulates the transportation of hazardous waste originating or passing through the State in Title 13, CCR. The California Highway Patrol (CHP) and Caltrans have primary responsibility for enforcing federal and state regulations and responding to hazardous materials transportation emergencies. The CHP enforces materials and hazardous waste labeling and packing regulations that prevent leakage and spills of material in transit and provide detailed information to cleanup crews in the event of an incident. Vehicle and equipment inspection, shipment preparation, container identification, and shipping documentation are all part of the responsibility of the CHP. Caltrans has emergency chemical spill identification teams at locations throughout the State.

California Fire Code: While NFC Standard 45 and NFPA 704 are regarded as nationally recognized standards, the California Fire Code (24 CCR) also contains state standards for the use and storage of hazardous materials and special standards for buildings where hazardous materials are found. Some of these regulations consist of amendments to NFC Standard 45. State Fire Code regulations require emergency pre-fire plans to include training programs in first aid, the use of fire equipment, and methods of evacuation.

3.4.3.4 Local Regulations

Most counties in California have prepared Hazardous Waste Management Plans (HWMPs) that outlines how hazardous waste generated in the county is managed. The HWMP identifies the types and amounts of wastes generated; establishes programs for managing these wastes; identifies an application review process for the siting of specified hazardous waste facilities; identifies mechanisms for reducing the amount of waste generated; and identifies goals, policies, and actions for achieving effective hazardous waste management

Contra Costa County has adopted an industrial safety ordinance that addresses the human factors that lead to accidents. The ordinance requires stationary sources to develop a written human factors program that considers human factors as part of process hazards analyses, incident investigations, training, operating procedures, among others.

3.4.4 SIGNIFICANCE CRITERIA

The impacts associated with hazards will be considered significant if any of the following occur:

- Non-compliance with any applicable design code or regulation.
- Non-conformance to National Fire Protection Association standards.
- Non-conformance to regulations or generally accepted industry practices related to operating policy and procedures concerning the design, construction, security, leak detection, spill containment or fire protection.
- Exposure to hazardous chemicals in concentrations equal to or greater than the Emergency Response Planning Guideline (ERPG) 2 levels.

3.4.5 ENVIRONMENTAL IMPACTS

As discussed in the Initial Study, some control measures have the potential to create hazards and hazardous materials impacts. For example, some control measures that would regulate VOC emissions by establishing VOC content requirements for products such as coatings may result in formulating these products with materials that are low or exempt VOC materials. Such reformulated products could have increased hazardous physical or chemical properties compared to the products that are currently being used, which could increase hazards through routine transport of disposal or through upset conditions involving an accidental release of these materials into the environment. Control measures that could require a control device to be installed may increase the risk of release at industrial facilities due to failure of the control equipment, which would then create an increase in potential hazard impacts caused by accidental release of hazards materials into the environment. Hazards could also be generated by the conversion of gasoline-fueled mobile sources to alternative fuels such as natural gas and propane, etc. This subchapter evaluates the potential hazards and hazardous materials impacts that could result due to implementation of the 2017 Plan and its control strategy.

3.4.5.1 Use of Reformulated Materials

The 2017 Plan includes control measures, including SS25 – Coatings, Solvents, Lubricants, Sealants, and Adhesives, SS26 - - Surface Prep and Cleaning Solvent, and SS27 – Digital Printing, that could require reformulation of consumer products including coatings, lubricants, sealants, adhesives, solvents, and digital inks. Manufacturers of coatings, lubricants, sealants, adhesives, solvents, and digital inks would be expected to comply with the control measures by lowering the VOC content in the regulated consumer products used in the Bay Area. A number of VOCs currently used in coating and solvent formulations have also been identified as TACs, such as ethylene-based glycol ethers, trichloroethylene (TCE), and toluene. When a product is reformulated to meet new VOC limits, however, a manufacturer could use a chemical, not used before, that may be a TAC.

The use of new formulations of coatings, lubricants, sealants, adhesives, solvents, and digital inks may alter chemical constituents of the products used in these operations. Previous experiences with regulations aimed at lowering VOC materials have indicated that manufacturers tend to use less hazardous solvents in reformulated products. It is expected that this will continue to be the trend with digital printing inks and solvents, and future compliant coatings are therefore expected to contain less hazardous materials, or non-hazardous materials, compared to conventional products, resulting in a net benefit regarding hazards (CARB, 2006).

The use of coatings, lubricants, sealants, adhesives, solvents, and digital inks is not expected to change from current practice, and thus the amount of material transported is not expected to change. Therefore, no additional transport of the coatings, lubricants, sealants, adhesives, solvents, and digital inks is expected and, no new hazards to the public will be created through transport, use, or disposal of hazardous materials. As a result, the proposed project is not expected to increase the probability of a hazardous material release.

It is assumed that coatings would be reformulated as water-based or with solvents that are less toxic. There are two hazards to be considered when evaluating hazard impacts from reformulating products and solvents: flammability and ignitions/explosions. Reformulation with water-based materials would reduce the risk of flammability, since solvents are not typically included as part of the formulation of these coatings. Alternative solvents can be used (e.g., TBAC and acetone) which have the same flammability rating as the conventional solvents (e.g., toluene, xylene, methyl ethyl ketone (MEK)) (see Table 3.4-4). The National Fire Protection

Association (NFPA) Flammability Classification for parachlorobenzotrifluoride (PCBTF) is the lowest of the solvents evaluated (1 = combustible if heated versus 3 = warning: flammable liquid flash point below 100°F)). Consequently, no increase in flammability due to reformulation is expected.

The auto-ignition temperature of a substance is the temperature at or above which a material will spontaneously ignite (catch fire) without an external source of ignition, such as a spark or flame. Flash point is the lowest temperature at which a liquid would have a concentration in the air near the liquid surface which could be ignitable by an external source of ignition (spark or flame). The lower the flash point, the easier it is to ignite the material. Tetrabutylammonium chloride (TBAC) has characteristics that are in the range of the conventional solvents (boiling points, evaporation rates, flash points and explosive limits, auto-ignition temperatures and vapor pressures) for the solvent it would replace. Parachlorobenzotrifluoride (PCBTF) also has characteristics that are similar to the solvents likely to be replaced; however, PCBTF's auto-ignition temperature is lower. While the auto-ignition temperature for PCBTF is the lowest of the solvents presented it is still 194°F and the flashpoint temperature of 109°F is higher than both the replacement solvents evaluated (CARB, 2006).

Acetone has characteristics that are similar to the conventional solvents it would likely replace; however, the flash point temperature is the lowest compared to all solvents evaluated (see Table 3.4-4). Acetone vapors will not cause an explosion unless the vapor concentration exceeds 26,000 ppm. In contrast, toluene vapors can cause an explosion at 12,000 ppm; the concentration of MEK that could cause an explosion is 14,000 ppm; and the concentration of xylene vapors that could cause an explosion is even lower at 10,000 ppm. Under operating guidelines of working with flammable materials in well-ventilated areas, as prescribed by the fire department codes, it would be difficult to achieve concentrated streams of such vapors. Therefore, reformulation is not expected to increase, and may actually reduce, ignition or explosion hazards.

TABLE 3.4-4
Chemical Characteristics for Common Solvents

Chemical Compounds	M.W.	Boiling Point (°F)	Flashpoint (°F)	Vapor Pressure (mmHg @ 68 °F)	Lower Explosive Limit (% by Vol.)	Flammability Classification (NFPA)*
Traditional/Conventional Solvents						
Toluene	92	231	40	22	1.3	3
Xylene	106	292	90	7	1.1	3
MEK	72	175	21	70	2.0	3
Isopropanol	60	180	53	33	2.0	3
Butyl Acetate	116	260	72	10	1.7	3
Isobutyl Alcohol	74	226	82	9	1.2	3
Stoddard Solvent	144	302-324	140	2	0.8	2
Petroleum	100	314-387	105	40	1.0	4

Chemical Compounds	**M.W.**	**Boiling Point (^oF)**	**Flashpoint (^oF)**	**Vapor Pressure (mmHg @ 68 ^oF)**	**Lower Explosive Limit (% by Vol.)**	**Flammability Classification (NFPA)***
Distillates (Naptha)						
EGBE	118	340	141	0.6	1.1	2
EGME	76	256	107	6	2.5	2
EGEE	90	275	120	4	1.8	2
Replacement Solvents						
Acetone	58	133	1.4	180	2.6	3
Di-Propyl Glycol	134	451	279	30	1	1
Propylene Glycol	76	370	210	0.1	2.6	1
Ethylene Glycol	227	388	232	0.06	3.2	1
Texanol	216	471	248	0.1	0.62	1
Oxsol 100	181	282	109	5	0.90	1
t-Butyl Acetate	113	208	59	34	1.5	3

Source: BAAQMD, 2005

*National Fire Protection Association. 0 = minimal; 1 = slight; 2 = moderate; 3 = serious; 4 = severe

The following safety practices and application techniques are recommended by the National Association of Corrosion Engineers (NACE) and the Society for Protective Coatings during the application of coatings and solvents including future compliant coatings and surface preparation and cleaning solvents.

- **Worker Isolation –** Areas where coatings with hazardous materials are applied should be restricted to essential workers. If feasible, these workers should avoid direct contact with hazardous materials by using automated equipment or an area with plenty of ventilation.

- **Protective Clothing and Equipment** – When there is the potential for hazardous material exposure, workers should be provided with and required to use appropriate personal protective clothing and equipment such as coveralls, footwear, chemical-resistant gloves and goggles, full faceshields, and suitable respiratory equipment.

- **Respiratory Protection –** Only the most protective respirators should be used for situations involving exposures to hazardous materials because they have poor warning properties, are potent sensitizers, or may be carcinogenic. Any respiratory protection program must, at a minimum, meet the requirements of the OSHA respiratory protection standard [29 CFR 1910.134]. Respirators must be certified by NIOSH and MSHA according to 30 CFR or by NIOSH (effective July 19, 1995) according to 42 CFR 84.

- **Worker and Employer Education –** Worker education is vital to a good occupational safety and health program. OSHA requires that workers be informed about hazardous materials they work with, potential hazards of those materials, training to minimize hazards, potential health effects of exposure, and methods to prevent exposure.

The hazard impacts of reformulating coatings, lubricants, sealants, adhesives, solvents, and digital inks are expected to be less than significant. It is expected that the lower VOC content materials will contain either less hazardous materials or non-hazardous materials, as compared to conventional products, resulting in a net benefit regarding hazards. Reformulation with water-based coatings would reduce the risk of flammability, since solvents are not typically included as part of the formulation of these coatings and replacement solvents, like TBAC and acetone, have the same flammability rating as the conventional solvents that would be replaced (toluene, xylene, MEK). Replacement solvents generally have auto-ignition temperature and flash point temperature characteristics that are similar or better than conventional solvents. Reformulation is not expected to increase, and may actually reduce, flammability, ignition and explosion hazards. Local fire department and OSHA regulations coupled with standard operating practices ensure that conditions are in place to protect against hazard impacts. Therefore, no significant hazards impacts are expected.

3.4.5.2 Increased Risk of Accidental Release from New Air Pollution Control Devices

3.4.5.2.1 Use of Ammonia in Selective Catalytic Reduction (SCR)

Proposed control measures SS11 – Refinery Facility-wide Emissions Limit; SS22 – Stationary Gas Turbines; and, TR20 – Ocean Going Vessels may require or encourage the use of SCR to reduce NOx emissions. Ammonia or urea is used to react with the NOx, in the presence of a catalyst, to form nitrogen gas and water. In some SCR installations, anhydrous ammonia is used. Although ammonia is currently used in SCRs throughout the Bay Area, safety hazards related to the transport, storage, and handling of ammonia exist. Ammonia has acute and chronic non-cancer health effects and also contributes to ambient PM10 emissions under some circumstances.

Onsite Release Scenario: The use of anhydrous ammonia involves greater risk than aqueous ammonia because it is stored and transported under pressure. In the event of a leak or rupture of a tank, anhydrous ammonia is released and vaporizes into the gaseous form, which is its normal state at atmospheric pressure and produces a toxic cloud. Aqueous ammonia is a liquid at ambient temperatures and gas is only produced when a liquid pool from a spill evaporates. Under current OES regulations implementing the CalARP requirements, both anhydrous and aqueous ammonia are regulated under California Health and Safety Code Section 2770.1.

Certain control measures may require the increased use and storage of ammonia. Combustion sources at facilities such as gas turbines and refineries may be required or may choose to use SCRs to comply with regulations that may be developed from the proposed 2017 Plan control measures. All of the stationary sources are located at industrial and commercial facilities, and are expected to be located in industrial/commercial zones. However, the use and storage of anhydrous ammonia could result in significant hazard impacts as there is the potential for anhydrous ammonia to migrate off-site and expose individuals to concentrations of ammonia that could lead to adverse health impacts. Anhydrous ammonia would be expected to form a vapor cloud (since anhydrous ammonia is a gas at standard temperature and pressure) and migrate from the point of release. The number of people exposed and the distance that the cloud would travel would depend on the meteorological conditions present. Depending on the location of the spill, a number of individuals could be exposed to concentrations of ammonia that would exceed the ERPG2 concentrations.

In the event of an aqueous ammonia release, the ammonia solution would have to pool and spread out over a flat surface in order to create sufficient evaporation to produce a significant vapor cloud. For a release from onsite vessels or storage tanks, spills would be released into a containment area, which would limit the surface area of the spill and the subsequent toxic emissions. The containment area would limit the potential pool size, minimizing the amount of spilled material that could evaporate, form a vapor cloud, and impact residences or other sensitive receptors in the area of the spill. Significant hazard impacts associated with a release of aqueous ammonia would not be expected. Therefore, the use of aqueous ammonia is preferred over anhydrous ammonia.

Transportation Release Scenario: Use and transport of anhydrous ammonia involves greater risk than aqueous ammonia because it is stored and transported under pressure. In the event of a leak or rupture of a tank, anhydrous ammonia is released and vaporizes into the gaseous form, which is its normal state at atmospheric temperature and pressure, and produces a toxic cloud. Aqueous ammonia is a liquid at ambient temperatures and pressure, and gas is only produced when a liquid pool from a spill evaporates. Deliveries of ammonia would be made to each facility by tanker truck via public roads. The maximum capacity of a tanker truck is 150 barrels. Regulations for the transport of hazardous materials by public highway are described in 49 Code of Federal Regulations (CFR) 173 and 177. Nineteen percent aqueous ammonia is considered a hazardous material under 49 CFR 172.

Although trucking of ammonia and other hazardous materials is regulated for safety by the U.S. Department of Transportation, there is a possibility that a tanker truck could be involved in an accident spilling its contents. The factors that enter into accident statistics include distance traveled and type of vehicle or transportation system. Factors affecting automobiles and truck transportation accidents include the type of roadway, presence of road hazards, vehicle type, maintenance and physical condition, and driver training. A common reference frequently used in measuring risk of an accident is the number of accidents per million miles traveled. Complicating the assessment of risk is the fact that some accidents can cause significant damage without injury or fatality.

The actual occurrence of an accidental release of a hazardous material cannot be predicted. The location of an accident or whether sensitive populations would be present in the immediate vicinity also cannot be identified. In general, the shortest and most direct route that takes the least amount of time would have the least risk of an accident. Hazardous material transporters do not routinely avoid populated areas along their routes, although they generally use approved truck routes that take population densities and sensitive populations into account.

The hazards associated with the transport of regulated (CCR Title 19, Division 2, Chapter 4.5 or the CalARP requirements) hazardous materials, including ammonia, would include the potential exposure of numerous individuals in the event of an accident that would lead to a spill. Factors such as amount transported, wind speed, ambient temperatures, route traveled, and distance to sensitive receptors are considered when determining the consequence of a hazardous material spill.

In the unlikely event that the tanker truck would rupture and release the entire 150 barrels of aqueous ammonia, the ammonia solution would have to pool and spread out over a flat surface in order to create sufficient evaporation to produce a significant vapor cloud. For a road accident, the roads are usually graded and channeled to prevent water accumulation and a spill would be channeled to a low spot or drainage system, which would limit the surface area of the spill and the subsequent toxic emissions. Additionally, the roadside surfaces may not be paved and may absorb some of the spill. Without this pooling effect on an impervious surface, the spilled ammonia would not evaporate into a toxic cloud and impact residences or other sensitive receptors in the area of the spill. An accidental aqueous ammonia spill occurring during transport is, therefore, not expected to have significant impacts.

In the unlikely event that a tanker truck would rupture and release the entire contents of anhydrous ammonia, the ammonia would be expected to form a vapor cloud (since anhydrous ammonia is a gas at standard temperature and pressure) and migrate from the point of release. There are federal, State and local agencies with jurisdiction over hazardous materials and waste that are responsible for ensuring that hazardous materials and waste handling activities are conducted in accordance with applicable laws and regulations. While compliance with these laws and regulations will minimize the chance of an accidental release of anhydrous ammonia, the potential will still exist that an unplanned release could occur. The number of people exposed and the distance that the cloud would travel would depend on the meteorological conditions present. Depending on the location of the spill, a number of individuals could be exposed to high concentrations of ammonia resulting in potentially significant impacts.

3.4.5.2.2 Use of Caustic in Wet Gas Scrubbers

Implementation of some control measures proposed in the 2017 Plan could result in the use of WGS technology to reduce NOx emissions including SS1 – Fluid Catalytic Cracking in Refineries, SS5 – Sulfur Recovery Units, SS6 – Refinery Fuel Gas, and SS7 – Sulfuring Acid Plants. Use of WGS may occur on refinery sources such as fluidized catalytic cracking units (FCCU), sulfur recovery units (SRU), and tail gas treatment units (TGU).

For any operator that chooses to install a WGS for control of FCCU emissions, hazardous materials may be needed to operate the WGS and additional solid waste is expected to be generated. Caustic is a key ingredient needed for the operation of a WGS. While there are several types of caustic solutions that can be used in WGS operations, caustic made from sodium hydroxide (NaOH) is the most commonly used for WGSs for FCCUs, and it is considered an acutely hazardous substance. Sodium hydroxide is in use at refineries, so onsite storage is expected to exist, but if needed a new storage tank may be constructed. The increased use would require additional truck deliveries of NaOH.

It is expected that the affected facilities will receive NaOH from a local supplier located in the Bay area. Deliveries of NaOH (50 percent by weight) would be made by tanker truck via public roads as is currently the case with existing NaOH deliveries. NaOH is typically delivered in 6,000 gallon trucks, so the proposed project would not introduce any new transportation hazards for NaOH.

The onsite storage and handling of NaOH creates the possibility of an accidental spill and release of NaOH. However, because NaOH has such a low vapor pressure (6.33 mm Hg at 40 ^{o}C or 104 ^{o}F) when compared to water (55.3 mm Hg at 40 ^{o}C or 104 ^{o}F) at the same temperature, any spill of NaOH would not be expected to evaporate faster than water. Thus, any spill of NaOH would be expected to stay in liquid form and would not likely exceed the ERPG-2 vapor concentration of five milligrams per cubic meter for NaOH. Further, operators at each affected facility who construct a new NaOH storage tank will need to build a containment berm large enough to hold 110 percent of the tank capacity in the event of an accidental release due to tank rupture. Thus, any spill of NaOH would not be expected to migrate beyond the boundaries of the berm onsite. Further, any spill of NaOH is not expected to present a potential offsite public and sensitive receptor exposure. Lastly, since NaOH is not a flammable compound, other types of heat-related hazard impacts such as fires, explosions, or boiling liquid expanding vapor explosions (BLEVE)s, are not expected to occur and, therefore, will not be evaluated as part of this hazards analysis. In conclusion, the hazards and hazardous materials impacts due to the use, tank rupture and the accidental release of NaOH are not expected to exceed the ERPG-2 concentration limit.

For WGSs that may be installed to control NOx from SRU/TGUs, the caustic used in the WGS is made from soda ash, instead of NaOH. Soda ash is the common name for sodium carbonate (Na2CO3), a non-toxic, non-cancerous, and non-hazardous substance. Soda ash has a NFPA health rating 2 because it corrosive, may be harmful if inhaled, and may cause skin irritation. Workers handling soda ash will need to take the necessary precautions as required by OSHA when dealing with this substance, which include the use of protective clothing including goggles, rubber gloves and coveralls. Thus, hazard impacts associated with the use, storage, or transportation relative to the deliveries of soda ash are not expected to exceed exposure thresholds as the material is non-toxic, non-hazardous, and non-carcinogenic.

3.4.5.3 Use of Alternative Fuels

The 2017 Plan would establish incentive programs that may require or promote the use of alternative fuels, including control measures TR14 – Cars and Light Trucks, TR17 – Planes, TR19 – Medium- and Heavy-Duty Trucks, TR21 – Commercial Harbor Crafts, and TR22 – Construction, Freight, and Farming Equipment. Use of alternative fuels in place of conventional fuels may present a potential safety issue due to the increased transport, use, and handling of alternative fuels. Most of the alternative fuels are flammable, and increased use could result in increased hazards associated with their transport and use, particularly in mobile sources.

3.4.5.3.1 Biofuels/Renewable Fuels

The hazards related to biofuels are primarily associated with the use of methanol and ethanol at in the manufacturing process and not the material from which the fuels are produced (e.g., corn, wood chips, vegetation, etc.). Therefore, the hazard impacts associated with biofuels will be limited to the discussion of methanol and ethanol.

The primary hazard associated with pure methanol is that it burns with an invisible flame. Ethanol is a highly flammable liquid with explosive limits in the range of 3.5 to 19 percent in air and a flash point of 54 degrees Fahrenheit. Ethanol vapors are also combustible, heavier than air, and may form an explosive mixture when combined with air.

The increase in production of biofuels would increase the demand for methanol and/or ethanol. The transport of methanol and ethanol would require additional transport to meet the increased demand. Since the probability of accidents is related to the miles traveled, an increase in the likelihood of an accident would be expected. However, the truck accident rate is small, on the order of one accident per five million miles traveled, and the accident rate with chemical releases is even less, so this would not be a significant risk factor.

Renewable fuels are expected to be manufactured at existing refineries or other industrial facilities and would not introduce new hazards. Biodiesel and renewable diesel are considered safer than conventional diesels; therefore, increased usage of biodiesel and renewable diesel with a concurrent decline in usage of conventional diesel will not significantly alter existing hazards associated with mobile source fuels. Consequently, increased usage of biodiesel and renewable diesel are not expected to generate significant adverse hazard impacts.

3.4.5.3.2 Compressed Natural Gas

Hazards associated with CNG are approximately equivalent or less compared to gasoline and diesel. Therefore, increased usage of CNG with a concurrent decline in usage of gasoline and diesel will not significantly alter existing hazards associated with mobile source fuels. Consequently, increased usage of CNG is not expected to generate significant adverse hazard impacts.

3.4.5.3.3 Propane

The energy content of a gallon of propane is lower than a gallon of gasoline (based on energy content, about 1.25 gallons of propane are equal to a gallon of gasoline). Compared to one gallon of diesel, the fuel equivalent for propane is 1.42. This requires larger fuel tanks in a propane vehicle to achieve the same range as a gasoline- or diesel-powered vehicle. It would also require more tanker deliveries to supply refueling stations with the same available energy as conventional fuels. Since the probability of accidents is related to the miles traveled, an increase in potential delivery accidents can be expected with propane than conventional fuels (assuming that they are delivered from similar source locations in similar sized tankers). However, the national truck accident rate is small (on the order of one accident per five million miles traveled) and the accident rate with chemical releases is even less, so this would not be a significant risk factor.

Propane is generally stored in above ground tanks. In case of a rupture, there is the potential for the gas to pool because it is heavier than air. This presents the possibility of a boiling liquid, vapor cloud explosion and fire with potential consequences to nearby structures and other storage tanks. NFPA 58 Code specifies the separation distances required between various sized propane tanks. Propane poses a somewhat greater safety risk than CNG, but lower than gasoline. Unlike natural gas, propane vapors are heavier than air, so that leaks from the fuel system tend to pool at ground level rather than disperse. The flammability limits of propane vapor in air are also broader than those for natural gas.

The hazards associated with propane are approximately equivalent or less compared to gasoline and diesel. Therefore, increased usage of LPG with a concurrent decline in usage of gasoline and diesel will not significantly alter existing hazards associated with mobile source fuels. Consequently, increased usage of propane is not expected to generate significant adverse hazard impacts.

3.4.5.3.4 Electric and Hybrid Vehicles Powered Vehicles

Electricity used to power vehicles is commonly provided by batteries, but fuel cells are also an emerging competitor. Batteries are energy storage devices, and fuel cells convert chemical energy to electricity. Commercially available electric vehicles (EVs) are mostly battery-powered at the current time. The following discussion concentrates therefore on battery powered EVs.

NiMH batteries can generate hydrogen gas if overcharged, which can lead to explosions without proper venting. In 1996, the International Center for Technology Assessment (ICTA) conducted a comprehensive review of the safety concerns associated with the use of EVs. The ICTA found risk of hydrogen emissions during stressful conditions has been virtually eliminated by the use of seals and proper valve regulation. By following the National Electric Codes (NECs) and the Society of Automotive Engineers (SAE) recommended safety practices and guidelines for the operation and maintenance of EVs and hybrids, any hydrogen gas risk during battery recharging would be eliminated (ICTA, 1996). There has been in a shift away from nickel metal hydride batteries in EV’s to lithium-ion batteries (UN 2010).

Li-ion batteries can be fire hazards. There are a few reported cases of fires caused by Li-ion batteries in EVs. In response to these fires, the National Highway Traffic Safety Administration (NHTSA) performed an investigation on the fire hazards associated with Li-ion batteries in EVs. The NHTSA concluded that EVs do not pose a greater risk of fire than gasoline-powered vehicles. The NHTSA also developed an interim guidance, with the assistance of the NFPA, DOE, and others, to increase and identify the appropriate safety measures for handling an EV or hybrid automobile accident (NHTSA, 2012).

Furthermore, all electrical propulsion vehicles must comply with Federal Motor Vehicle Safety Standard (FMVSS) 305. FMVSS 305 specifies performance requirements for limitation of electrolyte spillage, retention of propulsion batteries, and electrical isolation of the chassis from the high-voltage system during a crash event. FMVSS 305 assures that accidents involving EVs and hybrids cause no more electrical hazard than a gasoline- or diesel-powered vehicle.

Electric propelled vehicles are considered less hazardous than conventional fuel vehicles. The 2017 Plan expects that conventional-fueled vehicles will be replaced with alternative-fueled vehicles, which would generally result in a reduction in hazards associated with conventional-fueled vehicles. However, the extent to which conventional-fueled vehicles are replaced is uncertain.

3.4.6 CUMULATIVE HAZARDS IMPACTS

In addition to evaluating whether any action the Air District may take in implementing the proposed 2017 Plan will cause a significant hazard impact by itself, the EIR must also evaluate whether any District action may contribute to a significant cumulative impact caused by other existing and reasonably foreseeable activities (CEQA Guidelines Section 15064(h)). A significant cumulative hazard impact occurs where hazards at a given location (i.e., hazards from all past, present, and reasonably foreseeable future projects) combine to result in cumulative hazard impacts exceeding applicable exposure levels or resulting in non-compliance with applicable codes and standards. The geographical location for the cumulative analysis is the jurisdictional boundaries of the Air District, which includes all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties, and portions of southwestern Solano and southern Sonoma counties.

As described in Section 3.4.2, a number of hazards currently exist in the Bay Area including those associated with the transport and use of hazardous materials and hazardous waste. A total of 1,272 hazardous materials incidents in the Bay Area were report to OES in 2015. In addition, there are currently hazards from the use of air pollution control equipment and related materials required for their use including ammonia and caustic materials. Further, the use of fossil fuels results in potential impacts associated with fire, explosions, and accidental releases during fuel transport, storage, dispensing and use. Alternative fuels such as natural gas and propane may also result in hazards. However, the hazards associated with alternative fuels are generally less than or equivalent to hazards associated with the use of fossil fuels.

3.4.7 CONCLUSIONS

The hazards and hazardous material impacts are expected to be less than significant for the 2017 Plan for the following reasons:

- Reformulated Products: The analysis indicates that the hazard impacts associated with reformulated coatings, lubricants, sealants, adhesives, solvents, and digital inks are expected to be less than significant. An increase of future compliant reformulated materials would be expected to result in a concurrent reduction in the amount of materials formulated with conventional solvents. Further, the net number of accidental releases would be expected to remain constant, regardless of formulations being used, allowing for population growth in the district. Furthermore, solvents used in reformulated products tend to be less hazardous than conventional solvents.

- Accidental Release from New Air Pollution Control Devices: This section determined that the use of ammonia in SCRs could be potentially significant due to implementation of the control measures. However, the use of aqueous ammonia at concentrations less than 20 percent by volume is expected to reduce hazard impacts associated with ammonia use to less than significant. In addition, the hazard impacts associated with the increased use of caustic (NaOH and sodium carbonate) are expected to be less than significant. The hazards and hazardous materials impacts due to the use, tank rupture and the accidental release of NaOH are not expected to exceed the ERPG-2 concentration limit. Additionally, the hazard impacts associated with the use, storage, or transportation relative to the deliveries of soda ash are not expected to exceed exposure thresholds as the material is non-toxic, non-hazardous, and non-carcinogenic.

- Use of Alternative Fuels: The hazard impacts associated with the use of alternative fuels due to implementation of control measures in the 2017 Plan were determined to be less than significant when users of alternative fuels comply with existing regulations and recommended safety procedures. Further, any increase in the use of alternative fuels will result in a concurrent decrease in the amount of conventional fuels used in the district.

The 2017 Plan is not expected to introduce any new hazards into the Bay Area and as analyzed above, the impacts on hazards and hazardous materials are less than significant. Further, the 2017 Plan is expected to result in a reduction in the use of fossil fuels which will also reduce the potential for hazards and hazardous material spills. Therefore, hazards and hazardous materials impacts associated with the 2017 Plan are not cumulatively significant and would not make a considerable contribution to an existing cumulatively significant hazards/hazardous materials impact.

CEQA requires mitigation measures to be implemented to avoid or minimize any significant impacts. As no significant hazards and hazardous materials impacts have been identified, no mitigation measures to reduce or avoid noise impacts are proposed for the 2017 Plan.

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CHAPTER 3.5 HYDROLOGY AND WATER QUALITY

3.5 HYDROLOGY AND WATER QUALITY

3.5.1 INTRODUCTION

This section of the EIR evaluates the potential impacts of the 2017 Plan on water demand and water quality. The Initial Study (see Appendix A) noted that several stationary source control measures could require affected facilities to install air pollution control equipment or modify their operations to reduce stationary source emissions, and that these modifications could result in an increase in water demand and increased wastewater generation. In addition, the 2017 Plan calls for the Air District to promote the use of alternative fuels, which could have the potential to create water quality or groundwater quality impacts in the event of accidental releases during transport, storage and handling. Finally, the Plan includes measure that could require the reformulation of architectural coatings or other products, which could lead to a change in the nature and toxicity of wastewater effluent. These potential impacts are analyzed and assessed below.

3.5.2 ENVIRONMENTAL SETTING

3.5.2.1 Regional Hydrology

The state of California is divided into ten hydrologic (see Figure 3.5-1) regions corresponding to the state‘s major water drainage basins. The hydrologic regions define a river basin drainage area and are used as planning boundaries, which allows consistent tracking of water runoff, and the accounting of surface water and groundwater supplies.

The Air District is within the San Francisco Bay Hydrologic Region (Bay Region) which includes all of San Francisco County and portions of Marin, Sonoma, Napa, Solano, San Mateo, Santa Clara, Contra Costa, and Alameda counties. It occupies approximately 4,500 square miles; from southern Santa Clara County to Tomales Bay in Marine County; and inlad to near the confluence of the Sacramento and San Joaquin rivers at the eastern end of Suisun Bay. The eastern boundary follows the crest of the Coast Ranges, where the highest peaks are more than 4,000 feet above mean sea level (DWR, 2013a).

Some water agencies in the region have imported water from the Sierra Nevada for nearly a century to supply their customers. Water from the Mokelumne and Tuolumne rivers accounts for about 38 percent of the region’s average annual water supply. Water from the Sacramento-San Joaquin Delta (Delta), via the federal Central Valley Project (CVP) and the State Water Project (SWP), accounts for another 28 percent. Approximately 31 percent of the average annual water supply is from local groundwater and surface water, and 3 percent is from miscellaneous sources such as harvested rainwater, recycled water, and transferred water. Population growth and diminishing water supply and water quality have led to the development of local surface water supplies, recharge of groundwater basins, and incorporation of conservation guidelines to sustain water supply and water quality for future generations (DWR, 2013a).

The San Francisco Bay estuary system is one of the largest in the country and drains approximately 40 percent of the state's surface water from the Sierra Nevada and the Central Valley. The two major drainages, the Sacramento and San Joaquin Rivers, receive more than 90 percent of runoff during the winter and spring months from rainstorms and snow melt. Water from these drainages flows into what is known as the Delta region, then into the sub-bays, Suisun Bay and San Pablo Bay, and finally into the Central Bay and out the Golden Gate. Nearly half of the surface water in California starts as rain or snow that falls within the watershed and flows downstream toward the Bay. Much of the water flowing toward the Bay is diverted for agricultural, residential, and industrial purposes as well as delivery to distant cities of southern California as part of state and federal water projects.

San Francisco Bay encompasses approximately 1,600 square miles and is surrounded by the nine Bay Area counties of which seven borders the Bay. Other surface waters flow either directly to the Bay or Pacific Ocean. The drainage basin that contributes surface water flows directly to the Bay covers a total area of 3,464 square miles. The largest watersheds include Alameda Creek (695 square miles), the Napa River (417 square miles), and Coyote Creek (353 square miles) watersheds. The San Francisco Bay estuary includes deep-water channels, tidelands, and marshlands that provide a variety of habitats for plants and animals. The salinity of the water varies widely, as the landward flows of saline water and the seaward flows of fresh water converge near the Benicia Bridge. The salinity levels in the Central Bay can vary from near oceanic levels to one-quarter as much, depending on the volume of freshwater runoff (ABAG, 2013).

3.5.2.2 Surface Water Hydrology

3.5.2.2.1 Watersheds

The California Department of Water Resources (DWR) has grouped the watersheds in the Bay Region into six principle watersheds. These watersheds drain into Suisun Bay, San Pablo Bay, North San Francisco Bay, South San Francisco Bay, or directly into the Pacific Ocean. Large streams such as the Guadalupe River and Coyote and Alameda creeks, drain from the Coast Ranges and generally flow northwest into San Francisco Bay. The Alameda Creek watershed is the largest in the region at nearly 700 square miles. The Napa River originates in the Mayacamas Mountains at the northern end of Napa Valley and flows south into San Pablo Bay. Sonoma Creek begins in mountains within Sugarloaf State Park, then flows south through Sonoma Valley into San Pablo Bay. The major watersheds of the San Francisco Bay hydrologic region are summarized in Table 3.5-1.

FIGURE 3.5-1
Hydrologic Regions of California

TABLE 3.5-1
Watersheds of the San Francisco Bay Hydrologic Region

LOCATION	WATERSHED
North Bay	Corte Madera Creek Watershed
	Novato Creek Watershed
	Petaluma River Watershed
	Napa River Watershed
	Marin and North Bay Coastal Drainages(1)
Suisun Bay	GreenValley/Suisun Creeks watersheds
	Walnut Creek Watershed
	San Pablo/Wildcat Creeks Watersheds
	Suisun Bay Drainages(2)
East Bay	San Leandro Creek Watershed
	San Lorenzo Creek Watershed
	Alameda Creek Watershed
	East Bay Drainages(3)
South Bay	Coyote Creek Watershed
	Guadalupe River Watershed
	West Santa Clara Valley Drainages(4)
Peninsula	San Francisquito Creek Watershed
	San Mateo Creek Watershed
	San Mateo and Peninsula Coastal Drainages(5)

Source: AGAG, 2013
(1) Including Lagunitas Creek, Arroyo Corte Madera Creek, Miller Creek, etc.
(2) Including Sulphur Springs Creek, Laurel Creek, Mt. Diablo Creek, etc.
(3) Including Rodeo Creek, Cordonices Creek, Claremont Creek, Peralta Creek, Lake Merritt, etc.
(4) Including Stevens Creek, Permanente Creek, Saratoga Creek, etc.
(5) Including Cordilleras Creek, Colma Creek, Pilarcitos Creek, Pescadero Creek, San Gregorio Creek, etc.

3.5.2.2.2 Surface Water Bodies

The most prominent surface water body in the Bay Region is San Francisco Bay itself. Other surface water bodies include: creeks and rivers; ocean bays and lagoons (such as Bolinas Bay and Lagoon, Half Moon Bay, and Tomales Bay); urban lakes (such as Lake Merced and Lake Merritt); and human-made lakes and reservoirs (such as Lafayette Reservoir, Briones Reservoir, Calaveras Reservoir, Crystal Springs Reservoir, Kent Lake, Lake Chabot, Lake Hennessey, Nicasio Reservoir, San Andreas Lake, San Antonio Reservoir, San Pablo Reservoir, Upper San Leandro Reservoir, Anderson Reservoir, and Lake Del Valle).

3.5.2.3 Surface Water Quality

The San Francisco Bay Regional Water Quality Control Board (SFBRWQCB) is the lead agency charged with protecting and enhancing surface water and groundwater quality in the Bay Area. SFBRWQCB implements the Total Maximum Daily Load (TMDL) Program, which involves determining a safe level of loading for each problem pollutant, determining the pollutant sources, allocating loads to all of the sources, and implementing the load allocations. SFBRWQCB is taking a watershed management approach to runoff source issues, including TMDL implementation, by engaging all affected stakeholders in designing and implementing goals on a watershed basis to protect water quality. Representatives from all levels of government, public interest groups, industry, academic institutions, private landowners, concerned citizens, and others are involved in creating watershed action plans. The plans include actions such as improving coordination between regulatory and permitting agencies, increasing citizen participation in watershed planning, improving public education on water quality and protection issues, and prioritizing and enforcing current regulations more consistently (DWR, 2013a).

Despite successful regulation of municipal and industrial wastewater discharges through the NPDES permits, significant surface water quality issues remain to be resolved. Pollutants from urban and rural runoff include pathogens, nutrients, sediments, and toxic residues. Some toxic residues are from past human activities such as mining; industrial production; and the manufacture, distribution, and use of agricultural pesticides. These residues include mercury, polychlorinated biphenyls (PCBs), selenium, and chlorinated pesticides (DWR, 2013a).

Emerging pollutants in the region include flame retardants, perfluorinated compounds, nonylphenol fipronil, and pharmaceuticals. The SFBRWQCB monitors these pollutants through its Regional Monitoring Program; develops management strategies; and implements actions, including pollution prevention. Sanitary sewer spills can occur because of aging collection systems and treatment plants. Pollutants can spread over large areas, possibly sickening people and pets who contact them, and cleaning up the pollutants after flooding is difficult.

San Francisco Bay and a number of the streams, lakes, and reservoirs in the Bay Region have elevated mercury levels, as indicated by elevated mercury levels in fish tissue. The major source of the mercury is local mercury mining and mining activities in the Sierra Nevada and coastal mountains. Large amounts of contaminated sediments were discharged into the Bay from Central Valley streams and local mines in the region. Significant impaired water bodies include the Bay, the Guadalupe River in Santa Clara County (from New Almaden Mine), and Walker Creek in Marin County (from Gambonini Mine). Consequently, the SFBRWQCB has adopted TMDLs for mercury in the Bay, Guadalupe River, and Walker Creek. Wastewater treatment plants and urban runoff also are a source of mercury, and some wetlands may contain significant amounts of methylmercury (the bioavailable form of mercury in the aquatic environment) from contaminated sediments (DWR, 2013a).

San Francisco Bay is a nutrient-enriched (nitrogen and phosphorus) estuary, but has not suffered from some of the problems found in other similar estuaries with high nutrient concentrations. Dissolved oxygen concentrations in the Bay's subtidal habitats are much higher, and phytoplankton levels are substantially lower than expected in an estuary with such high nutrient enrichment. The phytoplankton growth is limited by strong tidal mixing, reduced sunlight due to high turbidity, and grazing clams (DWR, 2013a).

However, evidence suggests that the historical resilience of San Francisco Bay to the harmful effects of nutrient enrichment is weakening. Since the late 1990s, the Bay has experienced significant increases in phytoplankton biomass from Suisun Bay to the South Bay (30 to 105 percent) and significant declines in dissolved oxygen concentrations (2 to 4 percent). Also, cyanobacteria and dinoflagellate (red tide) blooms are occurring in portions of the bay. The SFBRWQCB is working collaboratively with stakeholders to evaluate the impacts of nutrients on water quality and to develop a regional nutrient management strategy (DWR, 2013a).

Sediments are dredged from San Francisco Bay to maintain navigation through shipping channels for commercial and recreational purposes. Long-term management strategies were established in 1998 to dispose of the sediments. These strategies include eliminating unnecessary dredging, disposing dredged material in the most environmentally sound manner, and maximizing the use of dredged material as a resource.

The quantity and quality of biological resources has declined in San Francisco Bay partly because of contaminants. Fewer fish and other aquatic and riparian species reside in the bay. Some species have significant levels of contaminants, which threaten their health and reproduction and necessitate health advisories discouraging consumption of the species.

Non-native invasive species are considered a growing water quality threat as they have reduced or eliminated populations of many native species, disrupted food webs, eroded marshes, and interfered with boating and other water contact recreation. San Francisco Bay is considered one of the most highly invaded estuaries in the world. Exotic and invasive species, such as the Chinese Mitten Crab, New Zealand Mud Snail, Asian Clam, and Atlantic Spartina (Cordgrass) threaten to alter the estuary's ecosystem and undermine its food web. The SFBRWQCB, California Department of Fish and Wildlife, and other agencies have developed the California Aquatic Invasive Species Management Plan, which focuses on early detection of invasive species, risk assessment of the primary introduction vectors, improved coordination among agencies, and rapid response actions. The State Coastal Conservancy has developed the Invasive Spartina Plan to address the threat from non-native Spartina (DWR, 2013a).

The rate and timing of freshwater inflows are among the most important factors influencing the physical, chemical, and biological conditions in San Francisco Bay. Retaining adequate freshwater inflows to the Bay is critical to protect migrating fish and estuarine habitat. Adequate inflows are necessary to control salinity, to maintain proper water temperature, and to flush out residual pollutants that cannot be eliminated by treatment or source management.

The Sacramento and San Joaquin Rivers flow into the eastern end of Suisun Bay, contributing most of the freshwater inflows to the bay. Many small rivers and streams also contribute fresh water. Much of the fresh water is impounded by upstream dams and is diverted to various water projects, which provide vital water to industries, farms, homes, and businesses throughout the state. The SFBRWQCB, the Central Valley Regional Water Quality Control Board, the SWRCB, and other stakeholders are working to improve Bay water quality by finding solutions to complex diversion issues. These agencies have formed the Bay-Delta Team to implement a long-term program that addresses impacts to beneficial uses of water in the bay and the Delta (DWR, 2013a).

Another water quality issue in the Bay Region is from stream channel erosion. An excess of sediment can be conveyed downstream, which leads to loss of riparian habitat and loss of spawning habitat for native salmonids. Stream erosion is accelerated by urbanization and additional impervious surfaces, land use conversion, rural development, and grazing. Many watersheds in the region are impaired by excessive sedimentation, a lack of large woody debris, and a lack of spawning gravels. The SFBRWQCB addresses these issues through its stormwater program, which regulates construction activities and controls erosion from developments; through working with flood control agencies on stream maintenance; and through its TMDL program, which sets load limits for discharge from sources such as roads, confined animal facilities, vineyards, and grazing lands. The SFBRWQCB also directs technical assistance and grant funding to locally managed watershed programs working on restoration projects and education and outreach efforts (DWR, 2013a).

3.5.2.4 Drainage and Runoff

During periods of rain, water flushes sediment and pollutants from urbanized parts of the Estuary into storm drain systems. These drains discharge directly to surface waters within the region, except in San Francisco, where stormwater is mixed with sewage and directed to the treatment plant.

Urban runoff contributes significant quantities of total suspended solids, heavy metals, petroleum hydrocarbons, and other pollutants to the waters of the region. The impacts of pollutants in urban runoff on aquatic systems are many and varied. For example, small soil particles washed into streams can smother spawning grounds and marsh habitat. Lead and petroleum hydrocarbons washed off from roadways and parking lots may cause toxic responses in aquatic life and exemplify another kind of threat.

The Water Board's urban runoff management program focuses on reducing pollutant transport through stormwater drain systems into surface waters. In general, measures that will effectively limit storm drain pollutant discharge will also limit direct runoff of pollutants into creeks, streams, and lakes. The program is structured around the municipalities and local agencies responsible for maintaining storm drain systems, and three classes of activities that are responsible for significant amounts of pollutant influx to those public storm drain systems: highways under the jurisdiction of the California Department of Transportation (Caltrans), industrial activities, and construction on areas larger than five acres. Within each of these program areas, the Water Board's urban runoff management approach emphasizes general, long-term planning to avoid any increases in pollutant loading, and more structured, intensive approaches when existing water quality problems require immediate action (RWQCB, 2015).

The SFBRWQCB has initiated a program that regulates certain municipal, industrial, and construction stormwater discharges through NPDES permits. Stormwater permits include requirements to prevent or reduce discharges of pollutants that cause or contribute to violations of water quality objectives. Compliance with these requirements is achieved through implementation of control measures or best management practices (BMPs) identified in dischargers' stormwater management plans or stormwater pollution prevention plans (SWPPPs) (RWQCB, 2015).

3.5.2.5 Floodplain Risk

Major floods occur in the Bay Region. The floods can be from creeks and rivers, local stormwater runoff, or from levee failures. Many streams in the region flood repeatedly, such as the Napa River, which has flooded Napa Valley several times causing widespread structural losses and agricultural damages. Floods can be flash floods or debris-flow floods and can inundate urban or coastal areas.

The Bay Region has more than 350,000 people who are exposed to flooding from a 100-year flood, and more than one million people who are exposed to flooding from a 500-year flood. The 500-year floodplain contains approximately 550,000 acres of land and 322,000 structures. The majority of exposure is in Santa Clara County, which has more than 600,000 people in the 500-year floodplain. A wide variety of projects and programs are implemented to reduce flood damages in the Bay Area. These include structural and non-structural measures and disaster preparedness, response, and recovery. The region has 150 public agencies that manage floods with 2,588 miles of levees and 222 dams and weirs (DWR, 2013a).

3.5.2.6 Ground Water Hydrology

3.5.2.6.1 Ground Water Resources

Groundwater resources in the Bay Region are supplied by both alluvial and fractured-rock aquifers. Alluvial aquifers are composed of sand and gravel or finer-grained sediments, with groundwater stored within the voids, or pore spaces, between the alluvial sediments. Fractured-rock aquifers consist of impermeable granitic, metamorphic, volcanic, or hard sedimentary rocks, with groundwater being stored within cracks, fractures, or other void spaces. The distribution and extent of alluvial and fractured-rock aquifers and water wells vary within the region. Municipal and irrigation wells in the region range in depth from about 100 to 200 feet in the smaller basins, and 200 to 500 feet in the larger basins. Well yields typically are less than 500 gallons per minute (gpm) in the smaller basins, and range from less than 50 gpm to approximately 3,000 gpm in the larger basins (DWR, 2013a).

The Bay Region contains 33 alluvial groundwater basins and subbasins underlying approximately 1,400 square miles, or about 31 percent of the region. The majority of the groundwater in the region is stored in alluvial aquifers. The most heavily used groundwater basins in the region are the Petaluma Valley and Napa-Sonoma Valley groundwater basins in the North Bay; the Santa Clara and San Mateo subbasins of the Santa Clara Valley Groundwater Basin and the Westside Groundwater Basin in the South Bay; and the Niles Cone and East Bay Plain subbasins of the Santa Clara Valley Groundwater Basin and the Livermore Valley Groundwater Basin in the East Bay (DWR, 2013a).

Fractured-rock aquifers are generally found in the mountain and foothill areas adjacent to alluvial groundwater basins. Due to the highly variable nature of the void spaces within fractured-rock aquifers, wells drawing from fractured-rock aquifers tend to have less capacity and less reliability than wells drawing from alluvial aquifers. On average, wells drawing from fractured-rock aquifers yield 10 gpm or less. Although fractured-rock aquifers are less productive compared to alluvial aquifers, they commonly are the critical sole source of water for many communities. The majority of water used in the Bay Region comes from alluvial aquifers or from imported water supplies (DWR, 2013a).

3.5.2.6.2 Groundwater Quality

Drought, overdraft, and pollution have impaired portions of all 33 groundwater basins in the Bay Area. The basins face a perpetual threat of contamination from spills, leaks, and discharges of solvents, fuels, and other pollutants. Contamination affects the supply of potable water and water for other beneficial uses. Some municipal, domestic, industrial, and agricultural supply wells have been removed from service due to the presence of pollution, mainly in shallow groundwater zones. Overdraft can result in land subsidence and saltwater intrusion, although active groundwater management has stopped or reversed the saltwater intrusion.

A variety of historical and ongoing industrial, urban, and agricultural activities and their associated discharges have degraded groundwater quality. Such discharges include industrial and agricultural chemical spills, underground and above-ground tank and sump leaks, landfill leachate, septic tank failures, and chemical seepage via shallow drainage wells and abandoned wells. The Bay Area has over 800 active groundwater cleanup cases, about half of which are fuel cases. In many cases, the treated groundwater is discharged to surface waters via storm drains. High priority cleanup cases include Department of Defense sites such as Hunter’s Point, Point Molate, Point Isabel (Moffett Field), and the “Brownfields” sites. These sites generally are contaminated former industrial sites in urban areas that are suitable for redevelopment.

Much of the Bay Region’s groundwater is considered to be an existing or potential source of drinking water. However, some groundwater is not, such as shallow or saline groundwater around the perimeter of San Francisco Bay. Successful groundwater management in the region ensures that groundwater basins provide high quality water for drinking; irrigation; industrial processes; and the replenishment of streams, wetlands, and San Francisco Bay.

The agencies in the region have implemented various programs to monitor and protect groundwater quality. The Sonoma Valley County Sanitation District (SVCSD), Zone 7, SCVWD, and ACWD are developing Salt and Nutrient Management Plans to ensure that Bay Region groundwater basins are protected, as required by SWRCB’s Recycled Water Policy. Also, SVCSD has developed a new guidance document to help local water agencies develop their own Salt and Nutrient Management Plans. The goal of the plans is to reduce the salts and nutrients that enter the region’s groundwater basins (DWR, 2013a).

3.5.2.7 Water Supply and Demand

The following water agencies serve the majority of the water demands in the Bay Area Region:

- Alameda County Water District (ACWD)
- Bay Area Water Supply and Conservation Agency (BAWSCA)
- Contra Costa Water District (CCWD)
- East Bay Municipal Utility District (EBMUD)
- Marin Municipal Water District (MMWD)
- City of Napa Water Department
- San Francisco Public Utilities Commission (SFPUC)
- Santa Clara Valley Water District (SCVWD)
- Solano County Water Agency (Solano CWA)
- Sonoma County Water Agency (Sonoma CW)
- Zone 7 Water Agency (Zone 7)

The Bay Area relies on imported water, local surface water, and groundwater for water supply. Local supplies account for about 30 percent of the total, and the remaining supply is imported from the State Water Project (SWP), Central Valley Project (CVP), and the Mokelumne and Tuolumne watersheds. In 2010, demand in the region was 1,278,480 acre-feet per year (af/yr)[1]. Demand is projected to grow to 1,680,963 af/yr in a normal year, and 1,666,870 af/yr in a single dry year by 2035 (see Table 3.5-2) (DWR, 2013a).

Some water agencies in the region have imported water from the Sierra Nevada for nearly a century to supply customers. EBMUD and SFPUC import surface water into the Bay Region from the Mokelumne and Tuolumne rivers via the Mokelumne and Hetch Hetchy aqueducts, respectively. Water from these two rivers accounts for approximately 38 percent of the average annual water supply in the Bay Area. Water from the Sacramento-San Joaquin Delta (Delta), via the federal CVP and the SWP, accounts for another 28 percent. Approximately 31 percent of the average annual water supply in the Bay Area comes from local groundwater and surface water; and three percent is from miscellaneous sources such as harvested rainwater, recycled water, and transferred water. Reservoirs in the region capture runoff to augment local water supplies and to recharge aquifers. Some reservoirs store water at the terminus of constructed aqueducts, such as the Santa Clara Terminal Reservoir at the terminus of the South Bay Aqueduct.

About a third of Bay Area residents get their water from local supplies. In the South Bay, local streams supply water to the SFPUC, San Jose and other cities in Santa Clara County, cities in Alameda County, and to small developments in the surrounding mountains. The Alameda County Water District, Zone 7 Water Agency (Zone 7) and SCVWD recharge their groundwater basins with local streams, as well as with deliveries from the SWP and the CVP. Local streams also play a large role in the North Bay, providing a majority of the water supply for Marin and Napa counties. Population growth and diminishing water supply and water quality have led to the development of local surface water supplies, recharge of groundwater basins, and

[1] One acre-foot of water is equal to approximately 325,851 gallons.

incorporation of conservation guidelines to sustain water supply and water quality for future generations (DWR, 2013a).

Bay Area water agencies manage a diverse portfolio of water supplies, including groundwater, local surface water, Sierra Nevada water from the Mokelumne and Tuolumne rivers, Delta water from the SWP and the CVP, and recycled water. San Francisco Public Utilities Commission (SFPUC), East Bay Municipal Utility District (EBMUD), and Santa Clara Valley Water District (SCVWD) have critical water interties to deliver water between water systems during emergencies such as earthquakes and wildfires. SWP contractors and DWR established the Monterey Agreement in 1994 to improve water management flexibility and increase the reliability of SWP deliveries during periods of water shortage (DWR, 2013a).

Historically, the Bay Area has experienced a significant increase in population with a minimal associated change in total water use. The Water Conservation Bill of 2009, or SBX7-7, provides the regulatory framework to support the statewide reduction in urban per capita water use. Each water retailer was required to determine and report its existing baseline water consumption and establish an interim target in their 2015 Urban Water Management Plan (UWMP) and a 2020 water use target in. Although water wholesalers are not required to meet the targets outlined in SBX7-7, many Bay Area wholesalers implement conservation programs and policies both to ensure compliance with SBX7-7 and to ensure that long-term water supply reliability goals are met (IRWMP, 2013).

These demand management measures, combined with alternative resources and strategies, and regulatory requirements, are expected to allow Bay Area water agencies to continue to meet projected demand through 2035 in average years. However, in dry years all but four major agencies (Marin Municipal Water District, City of Napa, SFPUC and Zone 7) project a shortfall. Without strong local and regional planning, most Bay Area Region water agencies could experience future supply shortfalls in severe droughts. Supplies and demands of the Bay Area Region are summarized in Table 3.5-2 below and show that supplies are adequate through 2035 except in dry year scenarios, in which a shortfall is projected (IRWMP, 2013).

TABLE 3.5-2
Summary of Bay Area Region Water Supply and Demand

		Projected				
	Current	**Normal Year**		**Single Dry Year**		**Multiple Dry Year**
	2010	2020	2035	2020	2035	Worst Case
Population[1]	7,331,716	8,231,905	9,186,676	8,231,905	9,186,676	
Supply (AFY)	1,475,595	1,719,535	1,793,699	1,522,959	1,563,757	1,073,975
Demand (AFY)	1,278,480	1,534,534	1,680,963	1,517,778	1,666,870	1,197,143
Difference (AFY)	197,115	185,001	112,736	5,181	-103,113	-123,168

Source: IRWMP, 2013
Note: [1] Does not include Sonoma CWA

3.5.2.8 Drinking Water Quality

Drinking water in the Bay Region ranges from high-quality Mokelumne and Tuolumne River water to variable-quality Delta water, which constitutes about one-third of the domestic water supply. Purveyors that depend on the Delta for all or part of their domestic water supply can meet drinking water standards, but still need to be concerned about microbial contamination, salinity, and organic carbon.

In 2013, the SWRCB completed a statewide report titled, "Communities that Rely on a Contaminated Groundwater Source for Drinking Water." The report identified contaminated wells statewide that exceed a primary drinking water standard prior to any treatment or blending. In the Bay Region, 28 contaminated wells were identified that are used by 18 water systems. Most of the affected drinking water systems are small and often need financial assistance to construct a water treatment plant or another facility to meet drinking water standards. The most prevalent contaminants in the region are arsenic, nitrate, and aluminum (DWR, 2013a).

3.5.2.9 Recycled Water

In the 1990s, a number of local agencies joined with the DWR and the United States Bureau of Water Reclamation to study the feasibility of using high-quality recycled water to augment water supplies and help the Bay-Delta ecosystem. This cooperative effort, known as the Bay Area Regional Water Recycling Program (BARWRP), produced a Master Plan for regional water recycling in 1999 for the five South Bay counties. Since then, local water agencies have built a number of projects consistent with BARWRP, and recycled water has come to be widely used in the Bay Area for a number of applications, including landscape irrigation, agricultural needs, commercial and industrial purposes, and as a supply to the area's wetlands. The 2006 Bay Area Integrated Regional Water Management Plan (IRWMP) identified 43 potential recycled water projects that could be implemented by the year 2020 (ABAG, 2013). The potential market for recycled water is estimated to be 240,000 acre-feet per year by 2025. The region increased its recycled water use over 36 percent, from 29,500 af in 2001 to 40,300 af in 2009 (DWR, 2013a). The largest use of recycled water is for landscape irrigation, including golf courses, wetlands, industrial uses, and agricultural irrigation.

3.5.2.10 Wastewater Treatment

Wastewater is generated by residential, commercial and industrial sources throughout the Bay Area. The Clean Water Act requires treatment of wastewater for the protection of human health and receiving water bodies and preservation of the health of aquatic and riparian species. Wastewater treatment facilities consist of staged processes with the specific treatment systems authorized through NPDES permits. Primary treatment generally consists of initial screening and clarifying. Primary clarifiers are large pools where solids in wastewater are allowed to settle out. The clarified water is pumped into secondary clarifiers and the screenings and solids are collected, processed through large digesters to break down organic contents, dried and pressed, and either disposed of in landfills or used for beneficial agricultural applications. Secondary clarifiers repeat the process of the primary clarifiers further, refining the effluent.

Other means of secondary treatment include flocculation (adding chemicals to precipitate solids removal) and aeration (adding oxygen to accelerate breakdown of dissolved constituents). Tertiary treatment involves the removal of nutrients and nearly all suspended organic matter from wastewater, and may consist of filtration, disinfection, and reverse osmosis technologies. Chemicals are added to the wastewater during the primary and secondary treatment processes to accelerate the removal of solids and to reduce odors. Chlorine is often added to eliminate pathogens during final treatment, and sulfur dioxide is often added to remove the residual chlorine. Methane produced by the treatment processes can be used as fuel for the plant's engines and electricity needs. Recycled water must receive a minimum of tertiary treatment in compliance with DHS regulations. Water used to recharge potable groundwater supplies generally receives reverse osmosis and microfiltration prior to reuse.

Wastewater treatment in the Bay Area is provided by various agencies as well as individual city and town wastewater treatments. Treated wastewater is generally discharged into a water body, evaporation pond or percolation basin, or used recycled for agriculture, irrigation or landscaping. The U.S. EPA's NPDES permit program affects how a municipality handles its sanitary wastewater. Tertiary treatment is now commonly required for discharges to bodies of water, particularly where there is potential for human contact. Properly managed wastewater treatment systems play an important role in protecting community health and local water quality

3.5.3 REGULATORY SETTING

There are a variety of overlapping federal, state and local regulations that regulate water resources and water quality. A number of federal regulations (e.g., the Clean Water Act) are primarily implemented by state agencies with oversight from the U.S. EPA. This section summarizes the more pertinent federal, state and local regulations on water resources.

3.5.3.1 Federal Regulations

3.5.3.1.1 Clean Water Act

The Clean Water Act (CWA) establishes the basic structure for regulating discharges of pollutants into "waters of the United States." The Act specifies a variety of regulatory and non-regulatory tools to sharply reduce direct pollutant discharges into waterways, finance municipal wastewater treatment facilities, and manage polluted runoff. Some of these tools include:

- Section 303(d) – Total Maximum Daily Loads (TMDLs);
- Section 401 – Water Quality Certification; and
- Section 402 – National Pollutant Discharge Elimination System (NPDES) Program.

Section 303(d) – Total Maximum Daily Loads (TMDLs): The CWA §303(d) requires the SWRCB to prepare a list of impaired water bodies in the state and determine total maximum daily loads (TMDLs) for pollutants or other stressors impacting water quality of these impaired water bodies. A TMDL is a quantitative assessment of water quality conditions, contributing sources, and the load reductions or control actions needed to restore and protect bodies of water in order to meet their beneficial uses. All sources of the pollutants that caused each body of water to be included on the list, including point sources and non-point sources, must be identified. The California §303 (d) list was completed in March 1999. On July 25, 2003, U.S. EPA gave final approval to California's 2002 revision of §303 (d) List of Water Quality Limited Segments. A priority schedule has been developed to determine TMDLs for impaired waterways. TMDL projects are in various stages throughout the District for most of the identified impaired water bodies. The RWQCBs will be responsible for ensuring that total discharges do not exceed TMDLs for individual water bodies as well as for entire watersheds.

Section 401 – Water Quality Certification: The RWQCBs coordinate the State Water Quality Certification program, or CWA §401. Under CWA §401, states have the authority to review any federal permit or license that will result in a discharge or disruption to wetlands and other waters under state jurisdiction to ensure that the actions will be consistent with the state‘s water quality requirements. This program is most often associated with CWA §404, which obligates the U.S. Army Corps of Engineers to issue permits for the movement of dredge and fill material into and from "waters of the United States".

Section 402 – National Pollutant Discharge Elimination System (NPDES) Program: Section 402: Section 402 regulates point-source discharges to surface waters through the National Pollutant Discharge Elimination System (NPDES) program. In California, the State Water Resources Control Board (State Water Board or SWRCB) oversees the NPDES program, which is administered by the Regional Water Quality Control Boards (RWQCBs). The NPDES program provides for both general permits (those that cover a number of similar or related activities) and individual permits. The NPDES program covers municipalities, industrial activities, and construction activities. The NPDES program includes an industrial stormwater permitting component that covers ten categories of industrial activity that require authorization under an NPDES industrial stormwater permit for stormwater discharges. The NPDES permit establishes discharge pollutant thresholds and operational conditions for industrial facilities and wastewater treatment plants. For point source discharges (e.g., wastewater treatment facilities), the RWQCBs prepare specific effluent limitations for constituents of concern such as toxic substances, total suspended solids (TSS), bio-chemical oxygen demand (BOD), and organic compounds.

Construction activities, also administered by the State Water Board, are discussed below under state regulations. Section 402(p) of the federal Clean Water Act, as amended by the Water Quality Act of 1987, requires NPDES permits for stormwater discharges from municipal separate storm sewer systems (MS4s), stormwater discharges associated with industrial activity (including construction activities), and designated stormwater discharges, which are considered significant contributors of pollutants to waters of the United States. On November 16, 1990, USEPA published regulations (40 CFR Part 122), which prescribe permit application requirements for MS4s pursuant to CWA 402(p). On May 17, 1996, USEPA published an Interpretive Policy Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems, which provided guidance on permit application requirements for regulated

MS4s. MS4 permits include requirements for post-construction control of stormwater runoff in what is known as Provision C.3. The goal of Provision C.3 is for the Permittees to use their planning authorities to include appropriate source control, site design, and stormwater treatment measures in new development and redevelopment projects to address both soluble and insoluble stormwater runoff pollutant discharges and prevent increases in runoff flows from new development and redevelopment projects. This goal is to be accomplished primarily through the implementation of low impact development (LID) techniques.

3.5.3.1.2 Safe Drinking Water Act (SDWA)

Passed in 1974 and amended in 1986 and 1996, the SDWA gives the EPA the authority to set drinking water standards. Drinking water standards apply to public water systems, which provide water for human consumption through at least 15 service connections, or regularly serve at least 25 individuals. There are two categories of drinking water standards: the National Primary Drinking Water Regulations (NPDWR), and the National Secondary Drinking Water Regulations (NSDWR). The NPDWR are legally enforceable standards that apply to public water systems. NPDWR standards protect drinking water quality by limiting the levels of specific contaminants that can adversely affect public health and are known or anticipated to occur in water.

3.5.3.1.3 Section 10 of the Rivers and Harbors Act

Section 10 of the Rivers and Harbors Act, administered by United States Army Corp of Engineers (U.S. ACE), requires permits for all structures (such as riprap) and activities (such as dredging) in navigable waters of the U.S.

3.5.3.1.4 Executive Order 11990 – Protection of Wetlands

Executive Order 11990 is an overall wetlands policy for all agencies managing federal lands, sponsoring federal projects, or providing federal funds to state or local projects. Executive Order 11990 requires that when a construction project involves wetlands, a finding must be made by the federal agency that there is no practicable alternative to such construction, and that the proposed action includes all practicable measures to minimize impacts to wetlands resulting from such use.

3.5.3.1.5 Executive Order 11988 – Floodplain Management

Executive Order 11988 directs federal agencies to avoid to the extent practicable and feasible short- and long-term adverse impacts associated with the occupancy and modification of floodplains, and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative. Further, Executive Order 11988 requires the prevention of uneconomic, hazardous, or incompatible use of floodplains; protection and preservation of the natural and beneficial floodplain values; and consistency with the standards and criteria of the National Flood Insurance Program (NFIP).

3.5.3.1.6 National Flood Insurance Act

The U.S. Congress passed the National Flood Insurance Act (NFIA) in 1968 and the Flood Disaster Protection Act in 1973 to restrict certain types of development on floodplains and to provide for a national flood insurance program (NFIP). The purpose of these acts is to reduce the need for large, publicly funded flood control structures and disaster relief. The NFIP is a federal program administered by the Flood Insurance Administration of FEMA. It enables individuals who have property (a building or its contents) within the 100-year floodplain to purchase insurance against flood losses. Community participation and eligibility, flood hazard identification, mapping, and floodplain management aspects are administered by state and local programs and support directorate within FEMA. FEMA works with the states and local communities to identify flood hazard areas and publishes a flood hazard boundary map of those areas. Floodplain mapping is an ongoing process in the Bay Area, and flood maps must be regularly updated for both major rivers and tributaries as land uses and development patterns change.

3.5.3.2 State Regulations

3.5.3.2.1 Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act established the State Water Resources Control Board and divided the state into nine regions, each overseen by a regional water quality control board (RWQCB). The nine regional boards have the primary responsibility for the coordination and control of water quality within their respective jurisdictional boundaries. Under the Porter-Cologne Water Quality Control Act, water quality objectives are limits or levels of water quality constituents or characteristics established for the purpose of protecting beneficial uses. The Act requires the RWQCBs to establish water quality objectives while acknowledging that water quality may be changed to some degree without unreasonably affecting beneficial uses. Designated beneficial uses, together with the corresponding water quality objectives, also constitute water quality standards under the federal Clean Water Act. Therefore, the water quality objectives form the regulatory references for meeting state and federal requirements for water quality control.

Each RWQCB is required to prepare and update a Basin Plan for their jurisdictional area. Pursuant to the CWA NPDES program, the RWQCB also issues permits for point source discharges that must meet the water quality objectives and must protect the beneficial uses defined in the Basin Plan.

3.5.3.2.2 Construction General Permit

The California Construction Stormwater Permit (Construction General Permit), adopted by the State Water Resources Control Board, regulates construction activities that include clearing, grading, and excavation resulting in soil disturbance of at least one acre of total land area. Individual storm water NPDES permits are required for specific industrial activities and for construction sites greater than five acres. Statewide general storm water NPDES permits have been developed to expedite discharge applications. They include the statewide industrial permit and the statewide construction permit. A prospective applicant may apply for coverage under one of these permits and receive Waste Discharge Requirements (WDRs) from the appropriate RWQCB. WDRs establish the permit conditions for individual dischargers. The Stormwater Rule automatically designates all operators of construction site activities that result in a land disturbance of equal to or greater than one and less than five acres as small construction activity under the NPDES stormwater permitting program. Site activities that disturb less than one acre are also regulated as small construction activity if they are part of a larger common plan of development or sale with a planned disturbance of equal to or greater than one acre and less than five acres, or if they are designated by the NPDES permitting authority. The NPDES permitting authority or U.S. EPA Region may designate construction activities disturbing less than one acre based on the potential for contribution to a violation of a water quality standard or for significant contribution of pollutants to waters of the United States.

The Construction General Permit authorizes the discharge of stormwater to surface waters from construction activities. The Construction General Permit requires that all developers of land where construction activities will occur over more than one acre to develop and implement a Stormwater Pollution Prevention Plan (SWPPP), which specifies Best Management Practices (BMPs) that will reduce pollution in stormwater discharges to the Best Available Technology Economically Achievable/Best Conventional Pollutant Control Technology standards; and, perform inspections and maintenance of all BMPs. Typical BMPs contained in SWPPPs are designed to minimize erosion during construction, stabilize construction areas, control sediment, control pollutants from construction materials, and address post construction runoff quantity (volume) and quality (treatment). The SWPPP must also include a discussion of the program to inspect and maintain all BMPs.

3.5.3.2.3 Drinking Water Standards

The California Safe Drinking Water Act, enacted in 1976, is codified in Title 22 of the CCR. The California Safe Drinking Water Act provides for the operation of public water systems and imposes various duties and responsibilities for the regulation and control of drinking water in the State of California including enforcing provisions of the federal Safe Drinking Water Act. The California Safe Drinking Water Program was originally implemented by the California Department of Public Health until July 1, 2014, when the program was transferred to the SWRCB via an act of legislation, SB 861. This transfer of authority means that the SWRCB has regulatory and enforcement authority over drinking water standards and water systems under Health and Safety Code §116271.

Potable water supply is managed through the following agencies and water districts: the California Department of Water Resources (DWR), the California Department of Health Services (DHS), the SWRCB, the U.S. EPA, and the U.S. Bureau of Reclamation. Water right applications are processed through the SWRCB for properties claiming riparian rights. The DWR manages the State Water Project (SWP) and compiles planning information on water supply and water demand within the state. Primary drinking water standards are promulgated in the CWA §304 and these standards require states to ensure that potable water retailed to the public meets these standards. Standards for a total of 88 individual constituents, referred to as Maximum Contaminant Levels (MCLs) have been established under the Safe Drinking Water Act as amended in 1986 and 1996. The U.S. EPA may add additional constituents in the future. The MCL is the concentration that is not anticipated to produce adverse health effects after a lifetime of exposure. State primary and secondary drinking water standards are codified in CCR Title 22 §§64431 - 64501. Secondary drinking water standards incorporate non-health risk factors including taste, odor, and appearance. The 1991 Water Recycling Act established water recycling as a priority in California. The Water Recycling Act encourages municipal wastewater treatment districts to implement recycling programs to reduce local water demands. The DHS enforces drinking water standards in California.

3.5.3.2.4 California Department of Fish and Wildlife

The California Department of Fish and Wildlife is responsible for conserving, protecting, and managing California's fish, wildlife, and native plant resources. To meet this responsibility, the Fish and Game Code (Section 1602) requires an entity to notify the Department of any proposed activity that may substantially modify a river, stream, or lake. The notification requirement applies to any work undertaken in or near a river, stream, or lake that flows at least intermittently through a bed or channel. This includes ephemeral streams, desert washes, and watercourses with a subsurface flow. It may also apply to work undertaken within the flood plain of a body of water.

3.5.3.2.5 Wastewater Treatment Regulations

The federal government enacted the CWA to regulate point source water pollutants, particularly municipal sewage and industrial discharges, to waters of the United States through the NPDES permitting program. In addition to establishing a framework for regulating water quality, the CWA authorized a multibillion dollar Clean Water Grant Program, which together with the California Clean Water Bond funding, assisted communities in constructing municipal wastewater treatment facilities. These financing measures made higher levels of wastewater treatment possible for both large and small communities throughout California, significantly improving the quality of receiving waters statewide. Wastewater treatment and water pollution control laws in California are codified in the CWC and CCR, Titles 22 and 23. In addition to federal and state restrictions on wastewater discharges, most incorporated cities in California have adopted local ordinances for wastewater treatment facilities. Local ordinances generally require treatment system designs to be reviewed and approved by the local agency prior to construction. Larger urban areas with elaborate infrastructure in place would generally prefer new developments to hook into the existing system rather than construct new wastewater treatment facilities. Other communities promote individual septic systems to avoid construction of treatment facilities which could encourage growth. The RWQCBs generally delegate management responsibilities of septic systems to local jurisdictions. Regulation of wastewater treatment includes the disposal and reuse of biosolids.

3.5.3.3 Local Regulations

3.5.3.3.1 McAteer-Petris Act/San Francisco Bay Conservation and Development Commission

The McAteer-Petris Act is a provision under California law that preserves San Francisco Bay from indiscriminate filling. The Act established the San Francisco Bay Conservation and Development Commission (BCDC) as the agency charged with preparing a plan for the long-term use of the Bay and regulating development in and around the Bay. The San Francisco Bay Plan, completed in January 1969, includes policies on 18 issues critical to the wise use of the Bay, ranging from ports and public access to design considerations and weather. The McAteer-Petris Act authorizes BCDC to incorporate the policies of the Bay Plan into state law. The Bay Plan has two key features: policies to guide future uses of the bay and shoreline, and maps that apply these policies to the bay and shoreline. BCDC conducts its regulatory process in accordance with the Bay Plan policies and maps, which guide the protection and development of the Bay and its tributary waterways, marshes, managed wetlands, salt ponds, and shoreline.

3.5.3.3.2 General Plan Safety Elements

Government Code §65302 as amended (2007 Cal. Stat. 369), requires that on or after January 1, 2009, the updated safety elements of general plans must incorporate significantly enhanced geographic data, goals, and policies related to flood hazards. This enhanced assessment of flood hazards will include, but is not limited to: flood mapping information from multiple agencies including FEMA, the Army Corps of Engineers, the Office of Emergency Services, the Department of Water Resources, and any applicable regional dam, levee, or flood protection agencies; historical data on flooding; an inventory of existing and planned development (including transportation infrastructure) in flood zones; and new policies that comprehensively address existing and future flood risk in the planning area.

3.5.3.3.3 Other Local Regulations

In addition to federal and state regulations, cities, counties and water districts may also provide regulatory advisement regarding water resources. Many jurisdictions incorporate policies related to water resources in their municipal codes, development standards, storm water pollution prevention requirements, and other regulations.

3.5.4 SIGNIFICANCE CRITERIA

As discussed in the Initial Study, the impacts associated with hydrology and water quality will be considered significant if any of the following occur:

Water Demand:

- The existing water supply does not have the capacity to meet the increased demands of the project, or the project would use more than 263,000 gallons per day of potable water (based on the estimated water demand for 500 new housing units).

Hydrology and Water Quality:

- The project will cause degradation or depletion of ground water resources substantially affecting current or future uses.
- The project will cause the degradation of surface water substantially affecting current or future uses.
- The project will result in a violation of National Pollutant Discharge Elimination System (NPDES) permit requirements.
- The capacities of existing or proposed wastewater treatment facilities and the sanitary sewer system are not sufficient to meet the needs of the project.
- The project results in substantial increases in the area of impervious surfaces, such that interference with groundwater recharge efforts occurs.
- The project results in alterations to the course or flow of floodwaters.

3.5.5 ENVIRONMENTAL IMPACTS

As discussed in the Initial Study, the 2017 Plan control strategy includes some measures which have the potential to create hydrology and water quality impacts. For example, control measures that would control PM and/or SOx emissions could require additional water use and wastewater discharge from air pollution emission control equipment, such as wet gas scrubbers of for dust control. Other measures could require additional water use, such as those that encourage the planting of trees/plants. However, determining and assessing any potential hydrology impacts from developing and promoting a model tree planting ordinance (NW2) or encouraging tree planting to cool roofs and parking lots (BL4) would be speculative at best. As such, these speculative impacts are not considered further in this EIR.

The 2017 Plan also includes measures to promote the use of alternative fuels, which could have the potential to create water quality or groundwater quality impacts in the event of accidental releases during transport, storage and handling. To reduce VOC emissions, some proposed control measures involve reformulating products. Under this circumstance, it is not expected that there will be a substantial increase in the volume of wastewater generated by affected facilities, but there could be a change in the nature and toxicity of water effluent. This subchapter evaluates the potential hydrology and water quality impacts that could result due to implementation of the proposed control measures in the 2017 Plan.

3.5.5.1 Potential Methods of Control

The sections below discuss the water demand, water quality, and wastewater production impacts of a variety of potential methods of control which could be required by the control measures of the 2017 Plan. These methods include dust suppression, hydrostatic testing, wet electrostatic precipitators, wet gas scrubbers, and other control equipment. Additional background information about these types of air pollution control equipment is provided in Section 3.1.2 of this EIR.

3.5.5.2 Hydrology and Water Quality Impacts from Air District Actions

3.5.5.2.1 Water Demand

The exact water demand impacts from SO_2, $PM_{2.5}$, ROG, and TAC control equipment would be difficult to calculate for several reasons. First, without knowing the desired level of control to sufficiently reduce pollutant concentrations, it is not possible to determine the number or size of stationary sources that would need to be retrofitted with air pollution control equipment. In addition, exact calculations would require knowing the replenishment method for maintaining a fresh solution, the flow rate, and the rate of evaporation, which depends on the operating temperature and humidity. All of these factors would need to be known for each individual piece of equipment in order to calculate the water demand.

Although the water demand created by the control strategy of the 2017 Plan cannot be calculated precisely, it is still possible to qualitatively assess the potential for significant water quality impacts. Table 3.5-3 lists a number of potential air pollution control technologies which could be required if certain stationary source measures associated with the 2017 Plan are implemented. As shown in Table 3.5-3, many of these control technologies do not use water as part of the emission control process and, therefore, would not be expected to contribute to water demand or water quality impacts. These control technologies will not be considered further in this analysis. As the table indicates, the only two control measures with the potential to increase water use and generate additional wastewater are wet electrostatic precipitators and wet gas scrubbers.

TABLE 3.5-3
Emission Control Technologies and Potential Water Use and Wastewater Generation

Potential Control Technology	Uses Water?	Generates Wastewater?
Baghouse	No	No
Compressor	No	No
Cyclone	No	No
Diesel Oxidation Catalyst	No	No
Diesel Particulate Filter	No	No
Electrostatic Precipitator (Dry)	No	No
Electrostatic Precipitator (Wet)	**Yes**	**Yes**
Flue Gas Treatment (Additive to Existing Amine System)	No	No
Flue Gas Treatment (Merox Treatment)	No	No
Selective Oxidation Catalyst	No	No
SOx Reducing Additive	No	No
Replacement of Old with New Diesel ICEs	No	No

Potential Control Technology	Uses Water?	Generates Wastewater?
Wet Gas Scrubber	**Yes**	**Yes**
Carbon Adsorption Equipment	No	No
Afterburners	No	No

The potential for water demand and water quality impacts from wet electrostatic precipitators and wet gas scrubbers is discussed below, along with the potential for impacts from dust suppression, hydrostatic testing, and other control equipment.

Wet Electrostatic Precipitator (ESP)

Installation of wet ESPs would require additional water, which is used as part of the emission control process. Control measures aimed at emission reductions from refineries and PM reduction may require the use of ESPs. Instead of clean water, it is likely that each affected operator would utilize strip sour water or similar existing treated process wastewater from elsewhere within each facility. Because existing sources of wastewater, e.g., strip sour water or similar existing treated wastewater, could be used to operate a wet ESP, the water demand from installing new add-on control equipment would be minimal. In addition, as discussed in Subsection 3.5.5.2.2 below, wastewater from the wet ESP can be treated and recycled back to the wet ESP, further minimizing water demand impacts. Thus, the volume of water associated with the installation and operation of a wet ESP to comply with potential future emission reduction requirements is expected to be minor and would not create a significant impact in terms of water demand.

Wet Gas Scrubber (WGS)

A WGS removes SO_2 from the flue gas by using a liquid solution that can be regenerated. As a result, installation of a WGS would result in an increased demand for water (SS1). For example, one wet ESP and one WGS were installed on the FCCU at the Phillips 66 Los Angeles Refinery to control sulfur oxide emissions, as well as PM10 and PM2.5 emissions. The environmental analysis for this project indicated that the expected water demand associated with the WGS was about 300 gallon per minute (432,000 gallons per day) (SCAQMD, 2007). Wet WGSs of this size are primarily designed for large emission sources (e.g., refineries and other large manufacturing facilities), but this technology can also be scaled down for use on smaller sources. The 2017 Plan control measures could lead to three new WGS at this size, plus additional WGS at smaller sources. The water demand from even one new WGS is over the significance threshold, however.

Dust Suppression

Water could be needed for dust suppression, to control fugitive dust emissions associated with site preparation for installation of new air pollution control equipment, or associated with new measures to reduce particulate matter emissions.

Installation of some types of relatively small air pollution control equipment (e.g., equipment, compressors, diesel oxidation catalysts, diesel particulate filters, and steam ejectors) is not expected to require site preparation activities because the equipment is generally not very large and could often be constructed onto existing equipment or foundations. In the event that some site preparation is necessary for these types of control technologies, plots would be small in area and would require little water for fugitive dust control. Therefore, little or no water for dust suppression purposes is expected to be needed for construction of compressors, diesel oxidation catalysts, and diesel particulate filters, or the replacement of diesel ICEs with new diesel ICEs.

For large air pollution control equipment, site preparation activities requiring water for dust control would likely be necessary. For example, one water truck per affected facility could be needed for dust suppression activities during initial site preparation/earth moving to install large air pollution control equipment. One water truck used for dust control can hold approximately 6,000 gallons, and it can be refilled over the course of the day if more than 6,000 gallons is needed. If one Flue Gas Treatment (FGT) unit (one of the largest types of potential control equipment) were installed in response to future emission reduction requirements, a typical system could require an area of approximately 6,000 square feet. By applying one gallon of water per square foot of disturbed area, at a minimum of two times per day to minimize fugitive dust, the total amount of water expected to be used for dust suppression is approximately 12,000 gallons per day for one affected facility. On windy days, a third water application could be needed. Thus, the total peak amount of water that could be used for dust suppression is approximately 18,000 gallons per facility per day. This analysis assumes that all water used for dust suppression activities is potable water. However, some affected facilities likely have access to reclaimed water supplies, which could be used instead of potable water for dust suppression activities. Finally, once construction is complete, water demand for fugitive dust control activities would cease.

The 2017 Plan includes several measures aimed at reducing particulate matter (PM), some of which could include the use of water. For example, new water fog systems, mist systems, and judicious other use of water to control dust per SS35 could be needed to control PM from large bulk material operations. Taken together, these could require a total of approximately 37,611 gallons of water per day. In contrast, measures SS31 and SS36 are not estimated to result in significant increased water use. The PM reduction called for by SS31 can be provided by baghouses or wet electrostatic precipitators, which were discussed previously. Reducing trackout of particulate matter through SS36 can be accomplished with little water use through approaches such as installing grizzy bars and dry mechanical and hand-sweeping to clean up any trackout.

Hydrostatic Testing

Hydrostatic testing could be needed in order to test some types of new equipment and piping, by filling equipment or piping with water to check for leaks. Because testing does not require the use of potable water, the water used for the hydrotesting equipment and associated piping would likely be comprised of industrial wastewater that is diverted for testing prior to discharge to the industrial sewer system. Using diverted wastewater would eliminate the need for additional potable water supplies and would not increase the amount of wastewater generated by a facility (e.g., refinery).

Therefore, water demand to perform hydrotesting of new equipment and piping, is expected to be minimal. In general, construction activities would have to be completed before hydrotesting could occur. As a result, it is not likely that water demand for fugitive dust control would overlap with water demand for hydrostatic testing. Further, hydrotesting needs to be completed prior to operation of the equipment so hydrostatic testing would not overlap with equipment construction activities (e.g., dust suppression) or equipment operation.

Water Demand Conclusion

Table 3.5-4 summarizes the potential water demand impacts from the different types of actions and control measures that were discussed above.

TABLE 3.5-4
Potential Water Demand Impacts Associated with 2017 Plan

ACTIVITY	POTENTIAL WATER USE (gpd)
Dust Suppression	85,600 – 109,600$^{(1)}$
Hydrostatic Testing	Unknown but expected to be minor
Wet Electrostatic Precipitator	Minimal (expected to be largely recycled water)
Wet Gas Scrubber	432,000 gallons per day$^{(2)}$
Plant Watering	Unknown
TOTAL WATER USE	517,600 – 541,600
Significance Threshold	263,000
SIGNIFICANT?	**Yes**

(1) Assumes dust suppression activities at four large construction projects, plus systems associated with particulate matter control under SS35.
(2) Source: SCAQMD, 2007. Assumes WGS at one refinery.

As shown in the table, water demand impacts from installing most types of air pollution control equipment that use water as part of the control process would not create water demand impacts that exceed the applicable water demand significance thresholds. However, water demand impacts from installing one large WGS could exceed applicable water demand significance thresholds.

The 2017 Plan also works to reduce water use through control measure WR2 by determining best practices to reduce water consumption, increasing water recycling, encouraging the adoption of water conservation ordinances, and developing public outreach and education programs on water conservation. Calculating the water demand reductions that could result from WR2 is not possible, however, because of the assumptions and speculation that would be needed. As a result, the water demand impacts of the 2017 Plan are concluded to be significant.

3.5.5.2.2 Wastewater and Water Quality Impacts

The 2017 Plan includes stationary source measures that may require additional air pollution control equipment with the potential to generate additional wastewater associated with the use of wet ESPs or WGSs. However, the use of wet ESPs and WGSs has been shown to be effective at reducing PM2.5 emissions and is a potential control methodology. The extent of the use of these types of control equipment is unknown.

Increased demand for water from the various air pollution control technologies will be directly proportional to any increases in wastewater from affected facilities. However, as with quantifying water demand, it is difficult to calculate the volumes of wastewater from air pollution control equipment for the following reasons. First, not all of the additional water demand generated by installing air pollution control equipment would ultimately be discharged as wastewater. Some proportion of the increased water demand would be emitted as steam or would evaporate during the control process. To determine the evaporation rate it is necessary to know the operating temperature and humidity in the vicinity of the equipment, which are currently unknown. In addition, wastewater discharge requirements under a facility's Industrial Wastewater Discharge Permit and current wastewater discharge rates need to be known.

Despite these uncertainties, wastewater and water quality impacts from air pollution control technologies that use water as part of the control process are evaluated in the following subsections to the extent possible based on available information.

<u>Dust Suppression</u>

Water used for dust suppression activities typically wets the top one to two inches of soil, evaporates and then forms a soil crust. As a result, this water does not flow into storm drains, sewers or other water collection systems. Therefore, water quality impacts from dust suppression activities are concluded to be less than significant.

<u>Hydrostatic Testing</u>

As noted above, water used for the hydrotesting tanks and associated piping would likely be industrial wastewater that is diverted for testing prior to discharge to the industrial sewer system. Requirements regarding the constituents and amount of effluent that can be released by any industrial facility into a sanitary sewer system are limited under a facility's IWDP from the local sanitation districts.

Using diverted wastewater would eliminate the need for additional potable water supplies to perform hydrostatic testing and would not increase the overall amount of wastewater generated by any affected facility, but would vary the discharge rate during construction. While the wastewater is diverted, the total daily discharge rate of a facility would decline. Upon completion of the hydrotesting for any new or modified equipment and piping, the hydrotest water would be returned to the existing wastewater stream, treated as necessary, and then discharged to the sanitary sewer system. The temporary increase in effluent levels would not be expected to exceed any existing wastewater discharge limits because refinery operators would be able to control the amount of effluent released each day.

Since hydrotest water would most likely be comprised of wastewater diverted from other equipment or processes, hydrotest water would not be expected to contribute to an exceedance of a facility's current wastewater discharge limits, require changes to existing wastewater permit conditions, or require new wastewater permits. Therefore, changes to existing permit conditions would not likely be required, and no violations of existing IWDPs, National Pollutant Discharge Elimination System permits, or other wastewater permit limits are expected.

Wet ESPs

An IWDP or NPDES permit entitles each affected facility to discharge wastewater. Since additional water would be needed as part of the wet ESP's pollution control process, the 2017 Plan could increase the wastewater generated by each affected facility. However, instead of clean water, it is likely that affected facilities (especially refineries) would utilize strip sour water or similar existing treated waste process water from elsewhere within each facility.

Wastewater from the wet ESP is collected and flows into a sump where it is typically treated and recycled to minimize water demand and wastewater generated from the equipment. Once recycled, wastewater generated by the wet ESP can also be returned to the wet ESP, which further reduces the total amount of water required for air pollution control, as well as the amount of wastewater discharged into the sewer system. For some types of wet ESPs, recirculation of treated water to the ESP may approach 100 percent.

If wastewater from the wet ESP resulted in discharges that are not within the percent variation allowed by the local sanitation districts, each affected facility would need to apply for a revision to its IWDP or other wastewater discharge permits to accommodate additional discharges to the sanitary sewer system. However, because existing sources of industrial process wastewater (e.g., strip sour water or similar existing treated waste process water) could be used to operate a wet ESP, additional wastewater generated from installing this new add-on control equipment would be minimal. Using existing sources of wastewater could actually result in a net decrease in the amount of wastewater discharged from the affected facility or refinery.

Wet Gas Scrubber

Water from the WGS can be treated and then recirculated back to the wet gas scrubber to be used again. Depending on a facility's water treatment system, the rest of the effluent may be further treated and discharged to the sanitary sewer system. Depending on the type of WGS, some water may be lost as steam.

One wet ESP with one WGS were installed on the FCCU at a Los Angeles Refinery to reduce SOx emissions, as well as PM10 and PM2.5 emissions. The environmental analysis for this project indicated that the expected wastewater discharge from the combined operation of the wet ESP and WGS was about 70 gallons per minute (about 100,800 gallons per day) (SCAQMD, 2007). Wet ESPs and WGSs of this size are primarily designed for large stationary emission sources (e.g., refineries and other large manufacturing facilities), but these technologies can also be scaled down for use on smaller sources. Wastewater from larger facilities such as refineries is often treated at existing wastewater treatment facilities operated by the facility, so increased wastewater may not be discharged to publicly owned treatment facilities. The wastewater that would be generated by the WGS would be required to be treated and discharged under an IWDP or NPDES permit. If a facility that installed a WGS would generate wastewater in excess of existing wastewater permit requirements, the wastewater permits would need to be revised and modified. Wastewater discharges would then need to comply with the existing or modified wastewater permit.

Alternative Fuels

Several measures were identified in the Initial Study for the 2017 Plan as having the potential to promote the use of alternative fuels, which could create water quality of groundwater quality impacts in the event of accidental releases. However, several of these are continuing activities, with no new actions proposed pursuant to the 2017 Plan. The proposed green ports incentives program (SS20) could potentially lead to increased use of alternative fuels. However, this program is just beginning and could involve a wide range of alternatives. As a result, it is impossible to determine at this point without speculation whether any significant groundwater quality impacts could result. As the program is developed, potential impacts will be considered and assessed appropriately pursuant to CEQA.

Reformulated Products

The 2017 Plan also includes control measures that could require reformulation of coatings, solvents, lubricants and adhesives (SS25, SS26 and SS27). While reformulated products would be expected to have lower VOC contents, the reformulations could have widely varying compositions depending on the chemical characteristics of the replacement solvents chosen. For example, most reformulations are expected to be made with water, but other reformulations could be made with a solvent that is exempt from the definition of a VOC, such as acetone. In addition, the control measures could result in the use of UV-cured resins and coatings which would not be expected to use water or generate wastewater. The development of reformulated products is expected to require the same types of equipment (e.g., spray guns, rollers, and brushes) currently used in coating operations, and the corresponding clean-up practices employed to clean the coating equipment would also not be expected to change.

At this point, the products that could be reformulated as a result of the control strategy in the 2017 Plan are unknown, as are the potential changes that would be made to these products. For those products reformulated with water, then water would also be used for clean-up and the resultant wastewater material could be disposed of into the public sewer system. For reformulated products made with exempt or non-exempt solvents, adverse impacts to water resources could result if clean-up and disposal of reformulated solvents, coatings or products were not handled properly. The use of water to reformulate coatings, solvents and products would generally lead to products that would be less toxic than products reformulated with either exempt or non-exempt chemicals (that are typically petroleum-based) and as such, these products would generate fewer impacts to water quality.

The use of aqueous-based or low VOC solvents may lead to adverse impacts to water resources if contaminated solvents are not handled properly. For example, if the material becomes contaminated with hazardous materials during the manufacturing or cleaning process, then the solution must be disposed of properly after its useful life. Proper disposal may be accomplished by use of wastewater treatment equipment or by shipping to a waste treatment, recycling or disposal site that accepts hazardous materials.

Illegal disposal of spent cleaning materials could result in significant adverse water quality impacts. Potential adverse wastewater impacts associated with reformulated solvents are expected to be minimal, however, since compliance with State and federal waste disposal regulations would minimize adverse impacts. State and federal regulations are also expected to promote the development and use of non-hazardous solvents. Wastewater which may be generated from reformulated inks is expected to contain less hazardous materials (e.g., water based) than the wastewater generated for solvent-based coating operations, thereby reducing toxic influent to the POTWs.

The only increase in wastewater discharge expected from the implementation of the 2017 Plan would be from new air pollution control equipment that utilizes water for control (e.g., ESPs and WGS). The wastewater discharge from a representative refinery project was estimated to be approximately 100,000 gallons per day. Industrial facilities that could potentially use ESPs and WGSs are expected to be relatively large facilities that maintain and operate wastewater treatment facilities under the requirements of IWDP or NPDES permits. While the installation of an ESP or WGS would likely increase the wastewater generated from a facility, the wastewater would be required to be treated by the industrial facility prior to discharge, and the wastewater is not expected to be discharged to public wastewater treatment plants. Facilities could be required to modify existing wastewater discharge permits. However, the discharge of wastewater under an approved discharge permit is expected to minimize the potential for significant water quality impacts. Wastewater permit modifications for large facilities (e.g., refineries) would likely not be required as these facilities operate wastewater treatment facilities and generate large amounts of wastewater on a daily basis.

The impacts of installing air pollution control equipment to comply with potential future emission reduction requirements that may be required to comply with control measures in the 2017 Plan are not expected to exceed any applicable water quality significance thresholds and, therefore, are concluded to be less than significant.

3.5.6 CUMULATIVE HYDROLOGY AND WATER QUALITY IMPACTS

In addition to evaluating whether any individual action the District may take in implementing the proposed 2017 Plan will cause significant hydrology and water quality impacts, the EIR must also evaluate whether any District action may contribute to a significant cumulative impact. Specifically, CEQA Guidelines Section 15064(h) requires an evaluation of whether the District's implementation of the proposed 2017 Plan will result in any "cumulatively considerable" contribution to an existing (or reasonably foreseeable future) significant hydrology and water quality impact. A significant cumulative impact occurs where water demand, wastewater generation and water quality impacts from all sources at a given location (i.e., from all past, present, and reasonably foreseeable future projects) combine to result in cumulative impacts. The same significance criteria identified in Section 3.5.4 apply to cumulative hydrology/water quality impacts as well as project-specific impacts.

As explained in detail in the preceding subsections, for the proposed regulatory measures that call for new emissions control requirements for stationary sources, implementation of these measures will occur at industrial or commercial facilities, and the potential control equipment that would be implemented could require water in excess of the water demand significance criteria (i.e., an increase in water demand over 263,000 gallons per day of potable water). Accordingly, stationary source control measures in the 2017 Plan may result in a cumulatively considerable contribution to water demand. The impacts on wastewater treatment and water quality associated with the 2017 Plan does not include any specifically identified actions that would result in any "cumulatively considerable" contributions to water treatment and water quality associated with stationary sources.

The District has considered the potential for the proposed 2017 Plan to contribute to cumulative hydrology and water quality impacts with respect to all potential existing and reasonably foreseeable future activities. In doing so, the District has considered the potential for other activities that could result from implementation of the Plan Bay Area, the Regional Transportation Plan and SB 375 Sustainable Communities Strategy adopted by BTC and ABAG. As MTC and ABAG found in their EIR for Plan Bay Area, implementation of Plan Bay Area will likely result in significant adverse impacts on water supplies due to the land use patterns which could cause water demand to disproportionately change in certain areas over others, concentrating people in certain geographical locations. Disproportional needs due to a change in land use patterns is also the cause of potentially significant adverse impacts relating to inadequate wastewater treatment capacity, and the need for new or expanded water and wastewater treatment facilities. Furthermore, there are potentially significant adverse impacts from development that requires new or expanded storm water drainage. The impacts are generated when development occurs outside of urbanized areas or when transportation projects increase the amount of impervious surfaces in an area. Development under the Plan Bay Area is not expected to exceed wastewater treatment requirement requirements of RWQCBs because development that takes place in rural areas typically utilizes septic tanks which are not under the purview of the RWQCB; therefore, the impacts are considered as less than significant (ABAG, 2013).

Implementation of the Plan Bay Area could result in potentially significant adverse water quality impacts due to an increase in the amount of impervious surface, which in turn causes an increase in the amount of polluted runoff. The Plan Bay Area EIR also identified potentially significant adverse impacts from construction-related ground disturbing activities that increase erosion by altering drainage patterns. Non-point source pollution of storm water was also a potentially significant adverse impact, as it will increase due to new developments and transportation projects as well as the increase from construction sites associated with ground disturbing activities (ABAG, 2013).

The District has taken these potential Plan Bay Area hydrology and water quality impacts into account in its cumulative impact analysis. The 2017 Plan is expected to result in cumulatively considerable contributions to water demand as it will result in potentially significant impacts on water demand. With respect to impacts on wastewater treatment and water quality, the 2017 Plan impacts are less than significant and are also not expected to make a cumulatively considerable contribution to wastewater treatment and water quality impacts.

Mitigation measures HWQ-1 and HWQ-2 are identified below for the proposed project, and these measures will also help mitigate the potentially significant cumulative water demand impacts associated with the 2017 Plan. However, cumulative water demand impacts are expected to remain significant as recycled water may not be available in all cases.

3.5.7 CONCLUSIONS

The discussion above found no significant impacts are expected in terms of wastewater or water quality. However, the potential future water demand created by the need for new air pollution control equipment to implement the 2017 Plan, particularly Wet Gas Scrubbers, would be a significant environmental impact. As a result, CEQA requires that mitigation measures be identified to reduce this impact to the extent possible. Two mitigation measures have been developed, as discussed below.

3.5.8 MITIGATION MEASURES

To reduce this impact, any affected facility that installs an air pollution control technology that increases demand for water will be required to comply with the following water demand mitigation measures:

HWQ-1 When air pollution control equipment is installed and water is required for its operation, the operator shall use recycled water, if available, to satisfy the water demand for the air pollution control equipment.

HWQ-2 In the event that recycled water cannot be delivered to the affected facility, the operator shall submit a written declaration with the application for an Authority to Construct permit for the air pollution control equipment, to be signed by an official of the water purveyor indicating the reason(s) why recycled water cannot be supplied to the project.

In spite of implementing the above water demand mitigation measures, water demand impacts remain significant as recycled water may not be available in all cases.

CHAPTER 3.6 NOISE

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Environmental Setting
Regulatory Setting
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Environmental Impacts
Cumulative Noise Impacts
Conclusions

3.6 NOISE

3.6.1 INTRODUCTION

This chapter of the EIR evaluates the 2017 Plan, including the 85 associated control measures, to determine whether the Plan would result in any significant noise impacts. The Initial Study that was prepared for the 2017 Plan examined the potential for noise impacts which could result from the adoption and implementation of the Plan. To summarize, the Initial Study determined that the installation of new or replacement equipment, including air pollution controls, would not have significant noise impacts, primarily because these construction activities would principally occur at industrial facilities such as refineries, power plants, and other similar facilities located in areas that are zoned for industrial uses and do not have sensitive noise receptors (see pages 2-41 through 2-44 of the Initial Study in Appendix A for more information). As a result, no noise impacts are anticipated from the regulatory actions proposed as part of the 2017 Plan, and these are not considered further in this EIR. The Initial Study did identify the possibility for noise impacts from construction and operation of projects that could potentially be funded through the Air District's grants and incentives programs, which are analyzed further below.

3.6.2 ENVIRONMENTAL SETTING

3.6.2.1 Terminology Used in Noise Analysis

Noise is sound that is unwanted by or objectionable to the person who hears it. Because all humans perceive and interpret sound differently, the types of sound that constitute "noise" are subjective. The objectionable nature of sound can be caused by its pitch or its loudness. The pitch of a tone or sound depends on the relative frequency of the vibrations by which it is produced. Its loudness depends on the amplitude of sound waves combined with the reception characteristics of the ear. Amplitude may be compared with the height of an ocean wave.

The range of sound pressure that can be perceived by the human ear is extremely large. The decibel is the preferred unit for measuring sound since it accounts for this range using a relative scale adjusted to the human range for hearing, which is referred to as the A-weighted decibel, or dBA. The A-weighted decibel assigns weighted values to selected frequency bands in an attempt to reflect how the human ear responds to sound. The range of human hearing is from 0 dBA, which is the threshold of hearing, to about 140 dBA, which is the threshold for experiencing pain.

Individual noise events, such as train pass-bys or aircraft overflights, are usually described either by the maximum noise level experienced during the event or based on the total amount of sound energy from the event. The maximum measured noise level is expressed as the "L_{max}" for the event. The total sound energy is expressed by as the "Sound Exposure Level" (SEL), which is a measure of the total sound energy over the duration of a noise event "squeezed" into a reference duration of one second. The SEL for a noise event is typically 5 to 10 dB higher than the L_{max}.

Ambient noise levels from multiple background sources are usually expressed by the cumulative noise level experienced at a given location averaged over a longer duration. “Equivalent Noise Level” (L_{eq}) is a measure of the average noise level experienced over a given period of time. It is defined as the equivalent steady-state sound level that, in a stated period, contains the same acoustic energy as the actual time-varying sound level during the same period. “Day/Night Noise level” (L_{dn}) and “Community Noise Equivalent Level” (CNEL) are measures of average noise levels (based on A-weighted decibels) over a 24-hour day, with nighttime noise given extra weighting to account for its higher perceived annoyance. L_{dn} measures average 24-hour noise with noise levels during the nighttime period (10:00 p.m. to 7:00 a.m.) increased by 10 dB. CNEL is similar to L_{dn}, but it increases noise during the evening period (7:00 p.m. to 10:00 p.m.) by 5 dB.

Table 3.6-1 provides definitions for these and other technical acoustical terms commonly used in this chapter.

TABLE 3.6-1
Definitions of Acoustical Terms

Term	Definition
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
A-Weighted Sound Level (dBA)	The sound pressure level in decibels as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise.
Community Noise Equivalent Level (CNEL)	The average A-weighted noise level during a 24-hour day, obtained after addition of 5 decibels to sound levels in the evening from 7:00 p.m. to 10:00 p.m. and after addition of 10 decibels to sound levels in the night between 10:00 p.m. and 7:00 a.m.
Day/Night Noise Level (L_{dn})	The average A-weighted noise level during a 24-hour day, obtained after addition of 10 decibels to levels measured in the night between 10:00 p.m. and 7:00 a.m.
Decibel (dB)	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure. The reference pressure for air is 20 micro Pascals.
Equivalent Noise Level (L_{eq})	The average A-weighted noise level during the measurement period.
Frequency (Hz)	The number of complete pressure fluctuations per second above and below atmospheric pressure. Normal human hearing is between 20 Hz and 20,000 Hz. Infrasonic sounds are below 20 Hz and ultrasonic sounds are above 20,000 Hz.
Intrusive	That noise which intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, time of occurrence, and tonal or informational content as well as the prevailing ambient noise level.
L_{01}, L_{10}, L_{50}, L_{90}	The A-weighted noise levels that are exceeded 1 percent, 10 percent, 50 percent, and 90 percent of the time during the measurement period.
L_{max}, L_{min}	The maximum and minimum noise levels during the measurement period.
Loudness	The amplitude of sound waves combined with the reception characteristics of the human ear.
Pitch	The height or depth of a tone or sound, depending on the relative rapidity (frequency) of the vibrations by which it is produced.

Term	Definition
SEL	Sound Exposure Level is a measure of cumulative noise exposure of a noise event expressed as the sum of the sound energy over the duration of a noise event, normalized to a one-second duration.
Sound Pressure	Sound pressure or acoustic pressure is the local pressure deviation from the ambient atmospheric pressure caused by a sound wave. Sound pressure can be measured using a microphone. The unit for sound pressure (p) is the Pascal [symbol: Pa or 1 Newton exerted over an area of 1 square meter (N/m^2).
Sound Pressure Level	The sound pressure level is expressed in decibels as 20 times the logarithm to the base 10 of the ratio between the pressures exerted by the sound to a reference sound pressure (e.g., 20 micro Pascals in air). Sound pressure level is the quantity that is directly measured by a sound level meter.
Vibration	Vibration means mechanical motion of the earth or ground, building, or other type of structure, induced by the operation of any mechanical device or equipment. The magnitude of vibration is stated as the acceleration in “g” units (1 g is equal to 32.2 feet/second^2 or 9.3 meters/second^2).

3.6.2.2 The Noise Environment in the San Francisco Bay Area

The approximately 5,600 square miles within the jurisdiction of the Bay Area Air Quality Management District include all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties, and portions of southwestern Solano and southern Sonoma counties. The total population of the region in 2010 was 7.15 million, with the most populous counties being Santa Clara (1.69 million), Alameda (1.37 million), and Contra Costa (1.05 million). About 17 percent of the region was developed as of 2010, with the remaining undeveloped area including open space and agricultural lands as well as water bodies and parks (ABAG, 2013).

Noise is a by-product of urbanization, and there are numerous noise sources and receptors in a highly urbanized region such as the San Francisco Bay Area. The region covers a diverse array of land uses that range from quiet, relatively undeveloped rural areas to loud, dense, urban areas. Ambient noise levels for areas where sensitive receptors may be located can range from 46 dBA for a small town or quiet suburban area to greater than 87 dBA for an urban area next to a freeway.

The existing noise environment in the Bay Area can be broken down into two categories of noise sources for purposes of this Program EIR: transportation sources, and stationary/other sources. Transportation sources include motor vehicle traffic on roadways, railroad operations such as light rail and commuter trains, and aircraft operations. Stationary/other sources are non-transportation sources such as industrial equipment, construction equipment, commercial operation, and any other sources not associated with the transportation of people or goods.

3.6.2.2.1 Transportation Noise Sources

Traffic is the predominant noise source in many parts of the San Francisco Bay Area. Traffic noise exposure is primarily a function of the volume of vehicles, the speed of those vehicles, the number of those vehicles that are medium and heavy trucks, the time of day (i.e., daytime vs. nighttime), and the proximity of noise-sensitive receivers to the roadway. Existing traffic noise exposure can be as low as 50 dB L_{dn} in isolated and less frequented areas, and as high as 75 dB L_{dn} in higher-traffic areas (FTA, 2006). Bus transit can also make a meaningful contribution to roadway noise levels. In San Francisco, however, a large portion of the transit bus fleet is electrified, and so its contribution to roadway noise levels is decreased (ABAG, 2013).

The Bay Area is also affected by noise from freight and passenger rail operations. While these operations generate significant noise levels in the immediate vicinity of the railways, train operations are intermittent and the region's railways are widely dispersed. Light rail such as SF MUNI and VTA operate with more frequency than heavy rail operations, but at lower speeds resulting in lower noise levels. Heavy rail operations such as BART, on the other hand, can attain greater speeds and have the potential for higher noise levels along extended stretches. The contribution of rail noise to the overall ambient noise environment in the Bay Area is relatively minor compared to other sources such as roadway traffic. Train operations may be a source of significant groundborne vibration near the tracks, however. Vibration-sensitive receivers within 100 feet of rail operations may be adversely affected by vibration exposure when trains pass by (ABAG, 2013).

The Bay Area is also home to a significant number of airports, including public use, private use, and military facilities. Major airports include San Francisco International, Oakland International and Norman Y. Mineta San José International. In addition to the numerous daily flights originating and terminating at these facilities, aircraft not utilizing these airports frequently fly over the Bay Area. All of these operations contribute to the overall ambient noise environment. In general, like rail noise, the proximity of the receiver to the airport and aircraft flight path determines the noise exposure. Other contributing factors include the type of aircraft operated, the altitude of the aircraft, and atmospheric conditions. Atmospheric conditions may affect which flight paths are used by air traffic, and may also affect aircraft noise propagation (ABAG, 2013).

3.6.2.2.2 Stationary and Other Noise Sources

A variety of stationary noise sources is located within the Bay Area. These include manufacturing plants, landfills, treatment plants (e.g., water), power generation facilities, food packaging plants, lumber mills, and aggregate mining facilities, just to name a few. Noise generated by these sources varies widely but can often be a significant if not dominant contributor to the noise environment at a given location.

One important non-transportation noise source is construction activity. Noise from construction equipment varies greatly depending on factors such as the type of operations being performed and the model, age, and condition of the equipment being used. Noise associated with diesel-powered heavy equipment often dominates the noise environment in the vicinity of construction sites. Equipment such as generators, pumps, and compressors may also contribute significantly to noise levels. The loudest operations are those involving impact equipment, such as pile driving and pavement breaking, which may also produce significant vibration in the vicinity. Maximum noise levels from typical construction equipment operations is approximately 75-100 dB (L_{max} at

50 feet), with heavy demolition and pile driving operations generating the highest noise levels. (FTA 2006.)

3.6.3 REGULATORY SETTING

General noise levels are primarily regulated through planning requirements and building standards that aim to ensure that noise-sensitive receptors are not exposed to incompatible noise levels, as well as through local noise ordinances that establish limits on the amount of noise that can be generated by industrial, commercial, construction, and other types of activities. Beyond these general regulatory mechanisms, transportation noise sources are also subject to a number of specialized requirements implemented by various state and federal transportation agencies.

3.6.3.1 General Noise Regulation

3.6.3.1.1 Standards for Ambient Noise Exposure Levels Experienced By Noise-Sensitive Land Uses

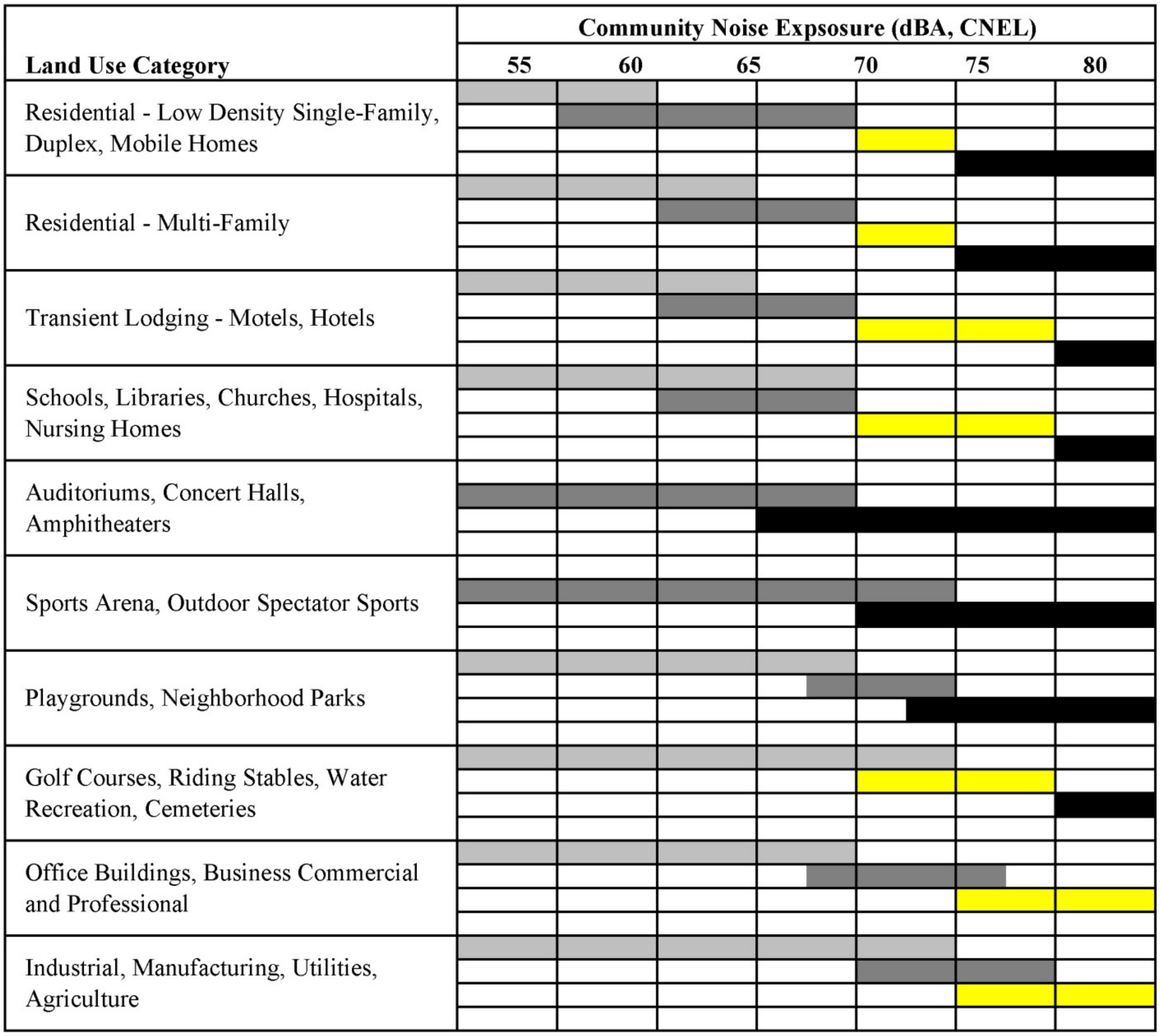
Cities and counties within the San Francisco Bay Area are required to adopt a noise element as part of their general plans to identify, assess, and provide mitigation for noise problems within their communities. The noise element typically assesses current and projected future noise levels associated with local noise sources, including, but not limited to, traffic, trains, aircraft, and industrial operations. The noise element identifies existing and foreseeable future noise problems and lays out potential solutions, and it serves as a guide for future land use decisions. The policies and programs set forth in the noise element are used primarily for planning purposes in order to ensure that noise-sensitive land uses are not sited in areas with incompatible noise-generating uses.

Many local noise elements incorporate land use compatibility guidelines developed by the Governor's Office of Planning and Research as part of its General Plan Guidelines. These compatibility guidelines, outlined in Table 3.6-2, address the amount of exterior noise exposure that different types of land uses can expected to tolerate without undue disturbance. The compatibility guidelines identify the amount of exterior noise that various land uses can be expected to accommodate with standard construction practices, which will bring noise levels within interior spaces down to acceptable levels for the specified type of land use. For example, as Table 3.6-2 shows below, noise-sensitive land uses are generally compatible with average daily exterior noise levels not exceeding 65 to 70 dB L_{dn}/CNEL. With exterior noise below these levels, interior noise exposure should not exceed average daily levels of 45 dB L_{dn}/CNEL within noise-sensitive spaces.

Higher exterior noise levels would require additional insulating techniques beyond common code practices to achieve acceptable interior noise levels. As such, the compatibility matrix in Table 3.6-2 can be used to assess the acceptability of existing or projected noise levels in a given area for a proposed land use in that area (ABAG, 2013). Although the Guidelines' compatibility standards are recommendations only and are not mandatory, many local jurisdictions follow them in adopting their own noise exposure goals and policies.

TABLE 3.6-2

Noise Land Use Compatibility Matrix



Normally Acceptable - Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction without any special noise insulation requirements.

Conditionally Acceptable - New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply system or air condionally will normally suffice.

Normally Unacceptable - New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and deeded noise insulation features including in the design.

Clearly Unacceptable - New construction or development should generally not be undertaken.

Source: Office of Planning and Research, 2003.

State and federal requirements for multiple-occupancy residential buildings such as apartment houses, hotels and the like apply similar standards for noise exposure. California's Noise Insulation Standards for new multi-family residential units, hotels, and motels require noise insulation sufficient to keep interior noise within 45 dB L_{dn}. The standards assume that interior noise will meet this standard as long as exterior noise is no greater than 60 dB L_{dn}, but require an acoustical analysis to demonstrate compliance in areas where exterior noise exceeds 60 dB L_{dn}. (24 CCR Pt. 2, Appx. Ch. 12 & 12A.) Similarly, the federal Department of Housing and Urban Development's Noise Abatement and Control requirements (24 CFR Pt. 51, Subpt. B) specify that exterior noise levels of 65 dBA L_{dn} or less are acceptable for residential land uses, and that exterior noise levels exceeding 65 dBA L_{dn} are normally unacceptable under most circumstances. These exterior noise standards are based on an assumption that with standard construction practices, interior noise levels will not exceed 45 dBA L_{dn} if the exterior standards are met.

3.6.3.1.2 Regulatory Limits on the Amount of Noise Generated By Specific Activities

In addition to planning and building requirements that aim to ensure that noise-sensitive receptors are not exposed to excessive noise levels, local cities and counties often impose regulatory limits on the amount of noise that can be generated by specific activities within their jurisdictions. These standards generally relate to noisy activities such as the use of loudspeakers and construction equipment, as well as stationary noise sources and facilities such as air conditioning units and industrial activities. Local noise regulations are intended to ensure that noise from individual noise sources does not cause or contribute to ambient noise levels that are incompatible with nearly sensitive land uses, in accordance with the noise element in the jurisdiction's general plan and related noise policies.

Furthermore, cities and counties often specify performance standards for non-transportation noise sources such as mechanical equipment at commercial locations or industrial facilities. These performance standards are used to address intermittent noise exposure, and are often expressed in terms of an average noise level (L_{eq}) or maximum noise level (L_{max}) generated by an activity or piece of equipment. These performance standards are generally tied directly to the noise limits specified in the noise ordinance in the city or county's municipal code (ABAG, 2013).

3.6.3.2 Regulation of Noise from Transportation Sources

In addition to the general regulation of noise-generating activities under land use planning policies and local noise ordinances, the federal and state governments have adopted various regulations for transportation noise sources. At the federal level, transportation noise is regulated under the U.S. Department of Transportation (USDOT), which includes the Federal Highway Administration (FHWA), the Federal Transit Administration (FTA), the Federal Railroad Administration (FRA), and the Federal Aviation Administration (FAA). At the state level, transportation noise is regulated by Caltrans and other state agencies.

Transportation noise regulations can be broken down into requirements that apply to noise generated by the operation of individual transportation vehicles, such as locomotives, trucks, and airplanes; and requirements that apply to transportation infrastructure, such highways and airports. These regulatory requirements are outlined below.

3.6.3.2.1 Regulations Applicable to Noise from Vehicles

Trucks and Automobiles

Federal regulations establish noise limits for medium and heavy trucks (more than 4.5 tons, gross vehicle weight rating) under 40 CFR Part 205, Subpart B. The federal truck pass-by noise standard is 80 dB at 15 meters from the vehicle pathway centerline. These standards are implemented through regulatory requirements applicable to truck manufacturers.

The State of California also implements noise limits for vehicles licensed to operate on public roads. For heavy trucks, the state pass-by standard is consistent with the federal limit of 80 dB. The state pass-by standard for light trucks and passenger cars (less than 4.5 tons gross vehicle rating) is also 80 dB at 15 meters from the centerline.

Railroad Locomotives and Railcars

Federal regulations in 40 CFR Part 201 and 49 CFR Part 210 set limits on the amount of noise that can be generated by locomotives, railcars, and related railroad operations such as railcar coupling. The regulations require that new locomotives be certified as meeting the applicable noise standards.

Airplanes

Aircraft operated in the U.S. are subject to certain federal requirements regarding noise emissions levels. These requirements are set forth in 14 CFR Part 36. Part 36 establishes maximum acceptable noise levels for specific aircraft types, taking into account the model year, aircraft weight, and number of engines.

3.6.3.2.2 Regulations Applicable to Noise from Transportation Infrastructure

In addition to regulations governing the amount of noise that can be generated by individual vehicles, federal and state agencies have also adopted requirements for noise generated by the transportation infrastructure that those vehicles use, such as highways, railways and airports.

Roadways

FHWA regulations in 23 CFR Part 772 establish requirements for considering noise impacts from federal highway projects. These regulations apply to any federally-funded project involving the construction of a new highway or significant modification of an existing freeway. They require the agency undertaking the project to evaluate potential noise abatement measures when the project would either (i) result in a substantial noise increase over existing levels (defined as an increase of 5-15 dB), or (ii) cause ambient noise levels to approach or exceed specified "Noise Abatement Criteria" at nearby noise-sensitive land uses. The Noise Abatement Criteria require evaluation of abatement measures when exterior noise levels will exceed 67 dB L_{eq} for most human-occupied land uses, or 72 dB L_{eq} for certain uses considered to be somewhat less sensitive to noise, such as hotels, motels, offices, and restaurants/bars.

At the state level, Caltrans has adopted a Traffic Noise Analysis Protocol to implement these requirements for federally-funded highway projects in California (Caltrans 2011). The Caltrans Protocol incorporates the FHWA Noise Abatement Criteria, and it defines a "substantial" project-related traffic noise level increase as an increase in worst-case-hour noise of 12 dB or more. Noise abatement measures need to be evaluated and considered for the project if the project will result in a substantial noise increase (12 dB or more), or if overall noise levels in the vicinity of the project are projected to exceed the FHWA Noise Abatement Criteria when the project is implemented (or to come within 1 dB of the Criteria).

Mass Transit Projects

The FTA has prepared a guidance document for evaluating noise and vibration impacts for proposed mass transit projects. The document, *Transit Noise and Vibration Impact Assessment* (FTA, 2006), provides guidance for how to evaluate noise and vibration impacts in the NEPA environmental review process for proposed mass transit projects seeking funding from FTA. All types of mass transit projects are covered, including bus and rail projects. The guidance contains procedures for assessing impacts at different stages of project development, from early planning before mode and alignment have been selected through preliminary engineering and final design. It establishes moderate and severe impact criteria based on the existing ambient noise environment and the sensitivity of nearby land uses that could be affected. The guidance also describes a range of mitigation measures for reducing noise and vibration impacts.

In addition, the Federal Railroad Administration (FRA) has developed similar guidance for assessing noise and vibration impacts of high-speed trains in its *High-Speed Ground Transportation Noise and Vibration Impact Assessment* guidance document (FRA, 2012). This guidance document is aimed at high-speed rail projects with speeds of 90-250 mph, whereas the FTA's *Transit Noise and Vibration Impact Assessment* guidance referred to above covers conventional train speeds below 90 mph. The FRA guidance provides for three levels of analysis, including a preliminary impact screening, a general assessment, and a detailed analysis, as well as a range of mitigation measures for dealing with adverse noise and vibration impacts. The report also includes criteria for evaluating the extent of potential impacts.

Airports

California's Airport Noise Standards, found in Title 21 of the California Code of Regulations, identify a noise exposure level of 65 dB CNEL as the noise impact boundary around airports. Within the noise impact boundary, airport proprietors are required to ensure that all land uses are compatible with the aircraft noise environment or obtain a variance from Caltrans.

Any actions that airport proprietors take to reduce aircraft noise in the vicinity of the airport are subject to approval by the FAA, which has the ultimate authority and responsibility to implement and enforce flight operational procedures and manage the air traffic control system. The FAA has allowed airport proprietors to implement a number of actions to address local community noise concerns, including runway use and flight routing changes, aircraft operational procedure changes, and engine run-up restrictions.

In addition, the FAA's Airport Noise Compatibility Planning regulations in 14 CFR Part 150 encourage airports to develop noise compatibility programs that identify nearby land uses that are incompatible with high noise levels from airport operations and propose measures to reduce any incompatibility. With an approved Part 150 program, airport projects such as land acquisition, residential/school sound insulation, etc., become eligible for federal funding. Within the Bay Area, Mineta San Jose International and San Francisco International have been designated has having a "noise problem" in accordance with these regulations.

3.6.3.3 Regulations Related to Vibration

3.6.3.3.1 Federal Vibration Policies

The FRA and FTA have published guidance on assessing vibration impacts. According to the FRA, fragile buildings can be exposed to groundborne vibration levels of 0.5 inches per second PPV without experiencing structural damage. The FTA has identified the human annoyance response to vibration levels as 80 VdB (U.S. FTA, 2006).[1]

3.6.3.3.2 State Vibration Policies

There are no adopted state policies or standards for ground-borne vibration. However, Caltrans recommends that extreme care be taken when sustained pile driving occurs within 7.5 meters (25 feet) of any building, and 15 to 30 meters (50 to 100 feet) of a historic building or a building in poor condition.

3.6.4 SIGNIFICANCE CRITERIA

As explained in the Initial Study, the Air District evaluates whether the proposed 2017 Plan will cause significant noise impacts based on applicable local noise ordinances. If an activity resulting from implementation of the 2017 Plan will generate noise levels at the boundary of the

[1] The peak particle velocity (PPV) is the maximum instantaneous peak of the vibration signal. The PPV is most frequently used to describe vibration impacts to buildings. The root mean square (RMS) amplitude is most frequently used to describe the effect of vibration on the human body. The RMS amplitude is defined as the average of the squared amplitude of the signal. The decibel notation, VdB, is commonly used to measure RMS. The decibel notation acts to compress the range of numbers required to describe vibration.

site where the activity takes place exceeding the levels set forth in an applicable local noise ordinance, that impact is considered a significant noise impact resulting from the 2017 Plan.
In addition, if the activity does not by itself generate noise impacts that exceed the ordinance, the cumulative impact of the activity must be evaluated in conjunction with noise from other past, present, and reasonably foreseeable probable future activities to determine the extent of their combined noise impact. If the cumulative effect of all such noise-generating activities exceeds the applicable noise ordinance, then the 2017 Plan would be considered to be contributing to a significant cumulative noise impact.

If that is the case, then the activity arising from the 2017 Plan must be evaluated to determine whether its incremental contribution to the problem is “cumulatively considerable,” and therefore significant. The Air District uses an incremental contribution of 3 dBA as the threshold for what constitutes a “cumulatively considerable” contribution. As a result, if the incremental contribution resulting from the 2017 Plan increases ambient noise levels by more than 3 dBA at the site boundary, then it would be considered to be making a cumulatively considerable contribution to a significant cumulative noise impact, and it would need to be treated as significant for purposes of the EIR analysis under CEQA. If the incremental contribution is less than 3 dBA, then the contribution is not cumulatively considerable and is not treated as significant.

Accordingly, the analysis in this chapter evaluates (i) whether any activity that may arise from the proposed 2017 Plan will generate noise levels at the boundary of the site where the activity takes place that will exceed the levels set forth in any applicable local noise ordinance (i.e., project-level impacts); and (ii) if noise levels are already exceeding such levels based on existing noise-generating activities (or will exceed them based on existing noise and reasonably foreseeable future projects), whether the incremental contribution resulting from the activity will increase ambient noise levels at the site boundary by more than 3 dBA (i.e., cumulative impacts).

3.6.5 ENVIRONMENTAL IMPACTS

As noted previously, the proposed 2017 Plan sets forth a comprehensive roadmap for Air District actions over the next few years to reduce air pollution and protect public health and the global climate. The Plan includes a number of different types of proposed implementation actions to achieve these goals, including stationary-source regulatory measures to reduce emissions from industrial facilities and grant funding measures to incentivize voluntary emission-reducing activities, among others.

Regarding the Air District’s proposed stationary-source regulatory measures, the District found in the Initial Study that the installation of new or replacement equipment, including air pollution controls, would not have significant noise impacts, because these activities would principally occur at industrial facilities such as refineries, power plants, and other similar facilities located in areas that are zoned for industrial uses and do not have sensitive noise receptors (see pages 2-41 through 2-44 of the Initial Study in Appendix A for more information). As a result, no noise impacts are anticipated from the regulatory actions proposed as part of the 2017 Plan, and these are not considered further in this EIR.

Regarding grants and incentives measures, the Air District is proposing to continue to use its grants and incentives programs to fund projects in furtherance of the Plan's goals of reducing air pollution and protecting public health and the global climate. As discussed previously, the District's grant programs include:

- The Transportation Fund for Clean Air, which funds cost-effective projects aimed at reducing on-road motor vehicle emissions in the Bay Area. These include shuttle bus and feeder bus services between transit hubs and commercial and employment centers, ridesharing and other trip reduction programs, bicycle projects such as bikeways and electronic bike lockers, and vehicle replacement projects that fund the replacement of older, higher-emitting vehicles with cleaner zero emission vehicles or partial zero emission vehicles.
- The Carl Moyer Program, which provides grants to upgrade or replace heavy-duty diesel vehicles and equipment such as trucks, school buses, agricultural equipment, marine vessels, and locomotives;
- The Mobile Source Incentive Fund, which provides grants to public and private sector for projects eligible for the Carl Moyer Program, vehicle scrappage and agricultural assistance programs, and for projects to reduce pollution from school buses; and
- The Goods Movement Program, which provides grants to upgrade or replace diesel freight movement equipment such as trucks, locomotives, harbor craft, and cargo handling equipment.

It is anticipated that some of the projects funded through these grants and incentives programs could affect the number, type, and concentration of vehicles circulating within the Bay Area. For example, the District may provide funds for shuttle or feeder routes to provide connections to transit hubs, which would add shuttle buses, vans, or other similar vehicles to local roadways. The District could also provide funds to support changes in the types of vehicles currently on the road, for example by funding an upgrade to lower-emission vehicles and heavy duty trucks. Additionally, some projects could affect travel patterns that could increase or decrease the number of vehicles on the roads, or affect the location and concentration of vehicle traffic. For example, projects promoting alternatives to automobile travel may reduce vehicle traffic in certain areas, while roadway modifications such as reducing automobile lanes to add bicycle lanes to a roadway could cause automobile traffic to shift to other routes, or to become more concentrated on certain routes. These changes could decrease automobile traffic in certain areas and increase it in other areas, depending on how exactly such projects are implemented. All of these actions have the potential to affect noise levels in the areas where they take place, at least to a certain degree.

In addition, some of the projects funded through these grants and incentives programs could require construction activity, for example if there is construction associated with building bike paths or installation of electric vehicle charging stations. Such construction activities could generate noise impacts, although the extent of any impacts would depend on the type of work involved. Construction equipment can generate significant noise levels, but the amount generated by specific types of equipment can vary greatly as shown in Table 3.6-3. As that table shows, different types of equipment can generate noise of between 74 and 101 dBA at 50 feet from the source. Depending on the nature and location of the noise, and when it occurs, noise at these levels – especially at the upper end of this range – could have the potential to exceed the levels allowed by applicable noise ordinances, which would constitute a significant impact.

TABLE 3.6-3
Construction Equipment Noise Levels

Equipment	Typical Noise Level 50 ft from Source (dBA)
Air Compressor	81
Backhoe	80
Ballast Equalizer	82
Ballast Tamper	83
Compactor	82
Concrete Mixer	85
Concrete Pump	82
Concrete Vibrator	76
Crane, Derrick	88
Crane, Mobile	83
Dozer	85
Generator	81
Grader	85
Impact Wrench	85
Jack Hammer	88
Loader	85
Paver	89
Pile-driver (Impact)	101
Pile-driver (Sonic)	96
Pneumatic Tool	85
Pump	76
Rail Saw	90
Rock Drill	98
Roller	74
Saw	76
Scarifier	83
Scraper	89
Shovel	82
Spike Driver	77
Tie Cutter	84

Equipment	Typical Noise Level 50 ft from Source (dBA)
Tie Handler	80
Tie Inserter	85
Truck	88

Source: U.S. FTA, 2006.

Furthermore, some construction activities could occur in residential areas, commercial areas, and employment centers, or in areas that are already impacted from existing noise-generating activities. Construction activities could also occur in areas impacted by currently-planned or reasonably foreseeable future projects, such that the cumulative noise from a District-funded project and other past, present and future projects, taken together, would exceed the levels allowed by applicable noise ordinances.

At this point, however, no specific projects have been proposed for grant or incentive funding from the 2017 Plan. When specific projects are proposed for funding through the Air District's grants and incentive programs, those projects will be required to comply with applicable noise requirements, such as Caltrans' Standard Specifications and Standard Special Provisions and local city and county noise ordinances. In most if not all cases, implementation of these requirements should reduce the potential impact of construction noise to a less than significant level.

Because the specific projects that would be funded are not known, the features of these projects that would affect noise levels also are not known. The number, type and concentration of any new vehicles that would be added to roadway traffic circulating around the Bay Area is unclear at this point, as is the specific roadways that would be involved, and so it is not possible to estimate the extent of any additional noise that would be generated. Similarly, if construction is involved, the types of construction equipment required, the hours during which such activities could take place, and the proximity to sensitive receptors are not known, and so it is not possible to estimate the extent of any additional noise from those activities either. Given this situation, until specific projects are proposed and funded by the District and these details are identified, it is not possible to say what level of noise may be generated, at what times and locations, and whether any sensitive receptors could potentially be impacted. It is therefore not possible to determine, beyond speculation, whether any construction noise from any specific project funded under the 2017 Plan will be above or below the levels allowed by any applicable noise ordinances. Thus, in accordance with Section 15145 of the CEQA Guidelines, the Air District is not evaluating potential noise impacts associated with such projects any further at this time. These noise concerns will be addressed by lead agencies approving any projects within their communities that may be funded by Air District grants and incentives.

3.6.6 CUMULATIVE NOISE IMPACTS

In addition to evaluating whether any action the Air District may take in implementing the proposed 2017 Plan will cause a significant noise impact by itself, the EIR must also evaluate whether any District action may contribute to a significant cumulative nose impact caused by other existing and reasonably foreseeable future noise-generating activities (CEQA Guidelines Section 15064(h)). A significant cumulative noise impact occurs where noise levels from all noise-generating sources at a given location (i.e., noise from all past, present, and reasonably foreseeable future projects) combine to result in cumulative noise levels exceeding those allowed in applicable local ordinances. Where an Air District action in implementing the proposed 2017 Plan would make an incremental contribution to any such noise levels in an amount of more than 3 dBA (measured at the boundary of the site where the activity is taking place), the District's action would be "cumulatively considerable" and thus significant.

The 2017 Plan does not include any specifically identified actions that would contribute to any existing or reasonably foreseeable significant noise impacts. As explained above, for the proposed regulatory measures that call for new emissions control requirements for stationary sources, implementation of these measures will occur at industrial facilities such as refineries and power plants that are zoned for industrial uses and do not have sensitive noise receptors located nearby that could be affected. Accordingly, noise generated at these locations is not expected to result in any significant noise impacts to sensitive receptors, either from noise generated by any single source or cumulatively from multiple sources combined. Implementation of the 2017 Plan will therefore not be contributing to any significant cumulative noise impacts.

For Air District funding of potential air quality related projects through its grants and incentives programs, there are no specific projects that have been proposed or approved at this point, so it is not possible to determine whether any such projects may be located in an area with any existing (or reasonably foreseeable future) noise exposures exceeding applicable local noise ordinances. Furthermore, to the extent that any projects may be located in such areas, it is not possible to determine whether any project the Air District may fund would increase noise in such areas by more than 3 dBA at the project site boundary. Where there is no way to project whether there will be any significant cumulative noise impact, or whether the Air District would make a cumulatively considerable contribution to any such impact, the EIR does not need to consider such impacts any further under CEQA Guidelines Section 15145.

In reaching these conclusions, the Air District has considered the potential for the proposed 2017 Plan to contribute to cumulative noise impacts with respect to all potential existing and reasonably foreseeable future noise-generating activities in general. In particular, the District has considered the potential for other noise-generating activities that could result from implementation of MTC and ABAG's *Plan Bay Area*, the Regional Transportation Plan and SB 375 Sustainable Communities Strategy adopted by those agencies described above. As MTC and ABAG found in their EIR for *Plan Bay Area*, implementation of *Plan Bay Area* will likely result in heavy construction activities such as pile driving necessary to build some of the transportation infrastructure called for in the Plan, which is expected to temporarily generate noise and vibration levels above established standards. Furthermore, increases in traffic volumes from increased freeway/roadway miles are expected to generate roadside noise levels that exceed FHWA Noise Abatement Criteria, particularly in areas that are located near high use areas such as freeways. In addition, extensions of existing transit lines and planned future transit sources like high speed rail are expected to cause noise and vibration exceeding FTA exposure criteria. The Air District has taken these potential *Plan Bay Area* noise sources into account in its cumulative impact analysis, as it has done with the potential for noise from any and all other noise-generating activities throughout the Bay Area generally. None of these *Plan Bay Area* impacts alters the analysis in the preceding paragraphs, however. To the extent that any noise generating activities that will result from *Plan Bay Area* may impact industrial facilities that may be covered by Air District stationary-source regulatory measures, the combined impacts from *Plan Bay Area* and the 2017 Plan will be in industrial areas with no nearby sensitive noise receptors. And with respect to any projects the District may fund through its grants and incentives programs, since the nature and location of any such projects is not known at this time, it is not possible to evaluate (beyond speculation) how they could potentially contribute to any noise impacts arising from *Plan Bay Area*.

For all of these reasons, there are no significant cumulative noise impacts associated with the proposed 2017 Plan that need to be addressed in the EIR.

3.6.7 CONCLUSIONS

Based on the above analysis, the Air District concludes that the 2017 Plan will not result in any significant noise impacts, individually or cumulatively, that must be addressed in this Program EIR. Although it is possible that certain activities the Air District could potentially fund through its grants and incentives programs could result in significant noise impacts, there are no such impacts that are apparent at the Plan stage. These noise concerns will be addressed by lead agencies approving any projects within their communities that may be funded by Air District grants and incentives.

CEQA requires mitigation measures to be implemented to avoid or minimize any significant impacts. As no significant noise impacts have been identified, no mitigation measures to reduce or avoid noise impacts are proposed for the 2017 Plan.

CHAPTER 3.7 TRAFFIC AND TRANSPORTATION

3.7 TRAFFIC AND TRANSPORTATION

3.7.1 INTRODUCTION

The 2017 Plan is designed as a comprehensive roadmap for the District's efforts over the next few years to reduce air pollution and protect public health and the global climate. The Plan focuses in particular on reducing emissions of ozone-forming pollutants in order to fulfill state ozone air quality planning requirements; on protecting public health by reducing emissions of ozone-forming pollutants, fine particulate matter, and toxic air contaminants; and on developing a regional climate protection strategy by reducing greenhouse gas emissions from a wide variety of sources.

To implement the Plan, the District will draw on the full repertoire of tools and resources at its disposal. This repertoire includes the District's principal regulatory tool, which is its rulemaking authority granted to it under the California Health & Safety Code to adopt mandatory regulations requiring stationary-source facilities to take action to reduce their air emissions. It also includes the District's grants and incentives programs, which provide monetary incentives for implementing voluntary actions to reduce emissions. And it also includes the District's role in promoting sound policy development and healthy air quality choices throughout all sectors of the economy and society. This last tool encompasses efforts such as providing technical support to other agencies as they develop and implement their own policies and programs to help achieve clean air; promoting best practices by developing model ordinances, guidance documents, and the like; outreach and education efforts to engage with community groups and other organizations; and advocacy in support of legislative and regulatory action at the federal and state levels in order to promote the District's air quality, public health, and climate protection goals.

The specific actions and activities that the District is proposing to take to implement the 2017 Plan are set forth in the Plan's control strategy set forth in Chapter 5 of the Plan, and in the individual control measures that make up the control strategy outlined in detail in Appendix H. This chapter of the EIR evaluates these implementation actions and activities to determine whether they will result in any significant traffic and transportation impacts.

The Initial Study (see Appendix A) evaluated the potential traffic and transportation impacts associated with implementation of the control measures in the 2017 Plan. The Initial Study determined that control measures in the 2017 Plan are not expected to substantially increase vehicle trips or vehicle miles traveled (VMT). These strategies to enhance mobility by reducing congestion through transportation infrastructure improvements, mass transit improvements, increasing telecommunications products and services, enhanced bicycle and pedestrian facilities, etc., are expected to result in reducing traffic congestion. Although population in the Bay Area is expected to increase by 2.1 million people by 2040, implementing control measures in the 2017 Plan, in conjunction with the 2013 RTP/SCS, would ultimately result in greater percentages of the population using transportation modes other than single occupancy vehicles. Even if congestion in the region increases compared to the baseline, this would occur for reasons other than complying with the 2017 Plan. Therefore, it is expected that implementing the 2017 Plan, including the RTP/SCS control measures could ultimately provide transportation improvements and congestion reduction benefits and would not conflict with applicable transportation plans, ordinances, or policies.

The Initial Study determined that implementation of 2017 Plan control measures that could result in construction activities include TR3 (Local and Regional Bus Service), TR4 (Local and Regional Rail Service), TR9 (Bicycle and Pedestrian Facilities), and TR18 (Goods Movement). Construction activities would be required to create new bus and rail routes and to build new bicycle and pedestrian lanes, as well as construction associated with transportation corridors in the Bay Area. Construction associated with rail and truck routes/corridors are expected to be located primarily in commercial and industrial zones within the Bay Area. Therefore, construction activities are expected to occur along heavily travelled roadways. Construction traffic could potentially result in increased traffic volumes on heavily traveled streets and require temporary lane closures. Construction traffic impacts, although temporary in nature, are potentially significant and are evaluated in this section of the EIR.

The Bay Area contains a large and complex transportation network that allows for multimodal access across the region. The transportation system includes interstate and state highways, local arterial roadways, local streets and roads, public transit systems, rail, bus and ferry transit, bicycle and pedestrian facilities, seaports, and airports; when combined, these facilities allow for the movement of people and goods throughout the region. The potential impacts of the 2017 Plan on the Bay Area transportation system are evaluated in this subchapter.

3.7.2 ENVIRONMENTAL SETTING

3.7.2.1 Existing Transportation Conditions

The Bay Area features a large and complex transportation network, allowing for multimodal access across the region. The transportation system includes interstate and state highways, local arterial roadways, local streets and roads, public transit systems, bicycle and pedestrian facilities, seaports, and airports; when combined, these facilities allow for the movement of people and goods throughout the region. The various elements of the Bay Area transportation system are described below.

3.7.2.1.1 Roadway Network

The Bay Area currently contains over 1,300 directional miles of limited-access highways, which include both interstates and state highways. These facilities form the backbone of the transportation system, providing access to major employment centers and to destinations outside of the Bay Area. In addition to providing mobility for automobiles, these facilities also support express/transbay bus services and freight movement. The major limited-access highways in the Bay Area are listed in Table 3.7-1. In addition, the Bay Area has over 33,000 directional miles of arterials and local streets, providing more localized access to individual communities. Together, these roadway facilities accommodate nearly 17 million vehicle trips a day (ABAG, 2013).

3.7.2.1.2 Public Transit Systems

There are over 11,500 transit route miles of service including heavy rail (Bay Area Rapid Transit or BART), light rail (Muni Metro and Santa Clara Valley Transportation Authority (VTA) Light Rail), commuter rail (Caltrain and Altamont Commuter Express or ACE), diesel and electric buses, cable cars, and ferries. Transit in the Bay Area accommodates almost 1.6 million boardings per day, primarily through four major operators (Muni, BART, AC Transit, and VTA). These four operators provide the most frequent service in the urban core of the Bay Area; a complete list of the major public transit operators is shown in Table 3.7-2. Amtrak also provides long-distance rail services to the Bay Area via the Capitol Corridor, San Joaquin, Coast Starlight, and California Zephyr lines— connecting the region to the Central Valley, southern California, the Pacific Northwest, and the Midwest (ABAG, 2013).

TABLE 3.7-1
Major Limited-Access Highways in the Bay Area

Route	Highway Limits(1)		Bay Area Counties Served(2)
Interstate 80	San Francisco	Teaneck, NJ	SF, ALA, CC, NAP, SOL
Interstate 280	San Francisco	San Jose	SF, SM, SCL
Interstate 380	San Bruno	South San Francisco	SM
Interstate 580	San Rafael	Tracy	MRN, CC, ALA
Interstate 680	Fairfield	San Jose	SOL, CC, ALA, SCL
Interstate 780	Vallejo	Benicia	SOL
Interstate 880	Oakland	San Jose	ALA, SCL
Interstate 980	Oakland	Oakland	ALA
Interstate 238	San Leandro	Castro Valley	ALA
Interstate 505	Dunnigan	Vacaville	SOL
U.S. Route 101	Olympia, WA	Los Angeles	SON, MRN, SF, SM, SCL
State Route 1	Leggett	Dana Point	SON, MRN, SF, SM
State Route 4	Hercules	Markleeville	CC
State Route 12	Sebastopol	San Andreas	SON, NAP, SOL
State Route 17	San Jose	Santa Cruz	SCL
State Route 24	Oakland	Walnut Creek	ALA, CC
State Route 29	Upper Lake	Vallejo	NAP, SOL
State Route 37	Novato	Vallejo	MRN, SON, NAP, SOL

Route	Highway Limits(1)		Bay Area Counties Served(2)
State Route 85	Mountain View	San Jose	SCL
State Route 87	San Jose	San Jose	SCL
State Route 92	Half Moon Bay	Hayward	SM, ALA
State Route 160	Sacramento	Antioch	SOL, CC
State Route 237	Mountain View	Milpitas	SCL
State Route 242	Concord	Concord	CC

Source: ABAG, 2013

Notes: (1) Reflects the overall route limits, rather than the limits of the limited-access segment.
(2) County abbreviations used: ALA (Alameda), CC (Contra Costa), Marin (MRN), NAP (Napa), San Francisco (SF), San Mateo (SM), Santa Clara (SCL), Solano (SOL), and SON (Sonoma).

TABLE 3.7-2
Major Public Transit Operators in the Bay Area

Transit System	Mode	Average Weekday Ridership(1)	Bay Area Counties Served
Muni	Local/express bus Light rail Cable car	666,000	MRN, **SF**, SM
BART	Heavy rail	369,000	**ALA, CC, SF, SM**
AC Transit	Local/transbay bus	198,000	**ALA, CC**, SCL, SF, SM
VTA	Local/express bus Light rail	135,000	ALA, **SCL**, SM
SamTrans	Local/express bus	45,000	SCL, SF, **SM**
Caltrain	Commuter rail	40,000	**SCL, SF, SM**
Golden Gate Transit/Marin Transit	Local/express bus Ferry	29,000	CC, **MRN**, SF, **SON**
County Connection	Local/express bus	12,000	ALA, **CC**
Santa Rosa City Bus	Local Bus	10,000	**SON**
Tri Delta Transit	Local/express bus	8,000	**CC**
Wheels	Local/express bus	6,000	**ALA**, CC
Sonoma County Transit	Local/express bus	5,000	**SON**
SolTrans(2)	Local/express bus	5,000	CC, **SOL**
WestCAT	Local bus Express/transbay bus	4,000	**CC**, SF
WETA(3)	Ferry	4,000	**ALA, SF, SM, SOL**
ACE	Commuter rail	3,000	**ALA, SCL**
FAST	Local/express bus	3,000	CC, **SOL**
Union City Transit	Local bus	2,000	**ALA**
VINE	Local/express bus	2,000	**NAP**, SOL

Transit System	Mode	Average Weekday Ridership(1)	Bay Area Counties Served
Petaluma Transit	Local bus	1,000	**SON**
Vacaville City Coach	Local bus	1,000	**SOL**
Rio Vista Delta Breeze	Local/express bus	<1,000	CC, **SOL**

Source: ABAG, 2013

Notes: Primary counties served by operator are marked in **BOLD**.
County abbreviations used: ALA (Alameda), CC (Contra Costa), Marin (MRN), NAP (Napa), San Francisco (SF), San Mateo (SM), Santa Clara (SCL), Solano (SOL), and SON (Sonoma).
(1) Reflects FY 2010-2011 ridership data; rounded to the nearest 1,000 daily riders.
(2) Includes prior services in Benicia and Vallejo (Benicia Breeze and Vallejo Transit [bus only]).
(3) Includes preexisting ferry services (Alameda/Oakland Ferry and Vallejo Transit [ferry only]).

3.7.2.1.3 Bicycle and Pedestrian Facilities

The availability of non-motorized facilities in the Bay Area supports the region's transportation, air quality, health, and livability goals. In addition to pedestrian facilities, such as paths and sidewalks, which exist throughout the region, the Bay Area has an extensive local system of bikeways. The California Highway Design Manual defines three classes of bikeways:

- Class I Bikeway (Bike Path): completely separated right-of-way for exclusive use of bicycles and pedestrians;
- Class II Bikeway (Bike Lane): dedicated lane for bicycle travel on a street or highway; and,
- Class III Bikeway (Bike Route): shared lane for bicycle travel on a street or highway.

Under the California Highway Design Manual definitions, the Bay Area has 700 miles of Class I facilities, over 2,000 miles of Class II facilities, and over 1,300 miles of Class III facilities (ABAG, 2013).

3.7.2.1.4 Seaports and Airports

The Bay Area is served by five seaports, which provide the opportunity for intermodal transfers to trucks and railcars. The Port of Oakland, the largest of the five, is the third largest U.S. seaport on the West Coast (after the Ports of Los Angeles and Long Beach). Other seaports include the Port of San Francisco; the Port of Richmond; the Port of Benicia; and the Port of Redwood City. These seaports are supported by freight railroad services operated by Union Pacific (UP) and Burlington Northern Santa Fe (BNSF).

The Bay Area is also served by three major international airports: San Francisco International Airport (SFO); Oakland International Airport (OAK); and Norman Y. Mineta San José International Airport (SJC). Each of these airports provides mobility for people and freight nationally and internationally. The region is also served by one smaller airport with limited commercial service, Charles M. Schulz Sonoma County Airport (STS), as well as numerous smaller general aviation airports (ABAG, 2013).

3.7.2.2 Regional Travel Patterns

The Bay Area transportation system offers numerous modes and routes for the movement of people and goods. Table 3.7-3 provides key metrics regarding Bay Area travel behavior in 2010, the most recent year of detailed U.S. Census data for the San Francisco Bay Area (ABAG, 2013).

Cars, buses, and commercial vehicles travel about 149 million miles a day on the Bay Area freeways and local roads (which is equivalent to about 21 vehicle miles traveled per day per person). Vehicle miles traveled (VMT) refers to the number of vehicle miles traveled within a specified geographic area during a given period of time. One vehicle traveling one mile constitutes one vehicle mile, regardless of its size or the number of passengers. VMT is a common measure of roadway use and economic activity. The region's per capita VMT is the total VMT divided by the population of the Bay Area; basically, it is a measure of the vehicle miles each person travels on average. In general, per capita VMT data correlate with various economic and lifestyle factors. Per capita VMT tends to increase as a result of greater overall economic activity in the region, higher levels of per household auto ownership, and greater demand for single-family homes in suburban locations (ABAG, 2013).

TABLE 3.7-3
Bay Area Travel Behavior (2010)

Daily[(1)] Transit Boardings	1,581,000
Daily Vehicle Trips[(2)]	16,912,000
Daily Vehicle Miles of Travel (VMT)	149,046,000
Daily Vehicle Miles of Travel[(2)] per Capita[(3)]	20.8
Daily Vehicle Hours of Recurring Delay	266,000
Daily Vehicle Hours of Recurring Delay (Freeways)	141,000
Daily Vehicle Hours of Recurring Delay (Expressways & Arterials)	58,000
Daily Vehicle Hours of Recurring Delay (Other Facilities)	67,000
Daily Vehicle Hours of Non-Recurrent Delay[(4)]	108,000
Total Daily Vehicle Hours of Delay	374,000
Average Vehicle Delay per Vehicle (Minutes)	4.6

Source: ABAG, 2013
Notes: (1) Daily metrics are measured for a typical weekday.
(2) Only reflects interzonal trips (assigned directly to the highway network); includes intraregional, interregional, airport-bound, and commercial vehicle trips.

(3) Total daily VMT is calculated using Travel Model One; therefore, to calculate per-capita VMT, it is essential to use simulated population levels to ensure consistency. Simulated population may be slightly different than overall population forecasts for Plan Bay Area EIR alternatives due to slight variability in modeling tools. Further clarification on this issue can be found in the Plan Bay Area Supplemental Reports.

(4) Only includes non-recurrent delay on freeway facilities.

3.7.2.3 Roadway Congestion and Delay

Delay on Bay Area roads and freeways amounts to over 374,000 hours per weekday. Delay is the time difference between travel under congested conditions and travel at posted speed limit. Recurrent delay arises from fluctuations in demand (such as rush hour traffic), the manner in which the facility is operated, and the physical layout of the roadway. Approximately 29 percent of weekday roadway delay is considered non-recurrent, which is caused by collisions, vehicle breakdowns, and other random events (such as inclement weather and debris). The magnitude of non-recurrent delay depends on the nature of the incident: a vehicle collision is likely to cause more delay than a vehicle pulled over on the shoulder (ABAG, 2013).

3.7.2.4 Daily Trips

Of the trips made by Bay Area residents, 30 percent are for work, 13 percent for college or school, and 14 percent for shopping, as shown below in Table 3.7-4. The average one-way commute distance for the region is about 13 miles, as shown in Table 3.7-5. San Francisco residents have the shortest average one way commute distance (6.9 miles), while Contra Costa County residents have the longest average one way commute distance (17.4 miles). The core counties of the region (San Francisco, San Mateo, Alameda, and Santa Clara) have commute distances less than the regional average, while the more suburban and rural outer counties (Contra Costa, Solano, Napa, Sonoma, and Marin) have commute distances greater than the regional average (ABAG, 2013).

TABLE 3.7-4
Typical Weekday Daily Person Trips by Purpose (2010)

Purpose	Trips	% of Total
Commute to Work	7,130,000	30%
Commute to College	573,000	2%
Commute to School	2,687,000	11%
At Work	1,661,000	7%
Eating Out	990,000	4%
Escort	2,380,000	10%
Shopping	3,190,000	14%
Social	702,000	3%

Purpose	Trips	% of Total
Other	4,278,000	18%
Total(1)	**23,592,000**	**100%**

Source: ABAG, 2013
Notes: Daily metrics are measured for a typical weekday.
(1) Only reflects intraregional personal trips.

TABLE 3.7-5
Average One-Way Commute Distance by County (2010)

County of Residence	Commute Distance (miles)
Alameda	13.5
Contra Costa	17.4
Marin	15.6
Napa	17.0
San Francisco	6.9
San Mateo	12.9
Santa Clara	11.0
Solano	15.6
Sonoma	16.6
Bay Area	**13.0**

Source: ABAG, 2013

3.7.2.5 Commute Modes and Patterns

According to the U.S. Census, Bay Area residents use a range of transportation modes to get to workplaces as shown below in Table 3.7-6. While approximately four in five Bay Area residents rely on an automobile to get to work on a typical day, ten percent of residents rely on public transit and four percent either walk or ride bikes to work.

TABLE 3.7-6
Bay Area Resident Workers Categorized by Means of Transportation to Work (1990 - 2010)

	1990	2000	2010
Drive Alone	2,105,000 (68%)	2,248,000 (68%)	2,243,000 (68%)
Carpool	400,000 (13%)	427,000 (13%)	354,000 (11%)
Transit	294,000 (10%)	321,000 (10%)	333,000 (10%)
Walk	112,000 (4%)	106,000 (3%)	112,000 (3%)
Bike	32,000 (1%)	36,000 (1%)	50,000 (2%)
Other	37,000 (1%)	36,000 (1%)	35,000 (1%)
Work at Home	105,000 (3%)	113,000 (4%)	194,000 (6%)
Total Workers	**3,086,000**	**3,306,000**	**3,321,000**

Source: ABAG, 2013

Over the past two decades, the share of workers driving alone to work has been fairly constant. Carpooling has decreased in popularity over the past decade, declining from 13 percent in 1990 to 11 percent in 2010. While transit mode share has remained constant over the past 20 years, bicycling to work has become more popular in the past decade. Finally, the percentage of Bay Area residents working from home has nearly doubled since 1990 (ABAG, 2013).

Significant variability in mode shares exists between Bay Area counties, as shown in Table 3.7-7. San Francisco County is the obvious exception, with the highest transit mode share (34 percent) in the region. In contrast to other counties, where four in five commuters rely on the automobile, less than half of San Francisco commuters use auto-based transportation. This leads to significantly higher mode shares for walking, biking, and transit. Four other counties have significant transit mode shares—Alameda, San Mateo, Contra Costa, and Marin. Higher transit mode shares in these locations is partly explained by their proximity to San Francisco job centers—strong transit connections to/from that county provide a competitive alternative to driving (given the high cost of parking and significant congestion that makes auto travel less desirable) (ABAG, 2013).

TABLE 3.7-7
Bay Area Resident Commute Mode Shares by County (2010)

Mode	Drive Alone	Carpool	Transit	Walk	Bike	Other	Work at Home
Alameda	67%	11%	11%	3%	1%	1%	6%
Contra Costa	69%	13%	9%	1%	1%	1%	6%
Marin	68%	10%	7%	5%	1%	0%	9%
Napa	79%	10%	1%	3%	0%	1%	5%
San Francisco	36%	8%	34%	9%	3%	2%	7%
San Mateo	70%	11%	8%	3%	1%	1%	5%
Santa Clara	78%	10%	3%	2%	2%	1%	5%
Solano	77%	14%	2%	2%	0%	1%	4%
Sonoma	76%	10%	2%	2%	1%	1%	8%
Total	**68%**	**11%**	**10%**	**3%**	**1%**	**1%**	**6%**

Source: ABAG, 2013

While the average travel time to work increased between 1990 and 2000, it has declined since 2000 as shown in Table 3.7-8. The average one-way commute duration for the Bay Area increased by seven percent between 1990 and 2010, from 25.6 minutes in 1990 to 27.4 minutes in 2007. However, since 2000, there has been a seven percent decline in commute duration as an average in the Bay Area. The major downturn in the regional economy during this period appears to have played a significant factor in reducing congestion. Between 2000 and 2010, Alameda and Marin counties each experienced a substantial reduction in travel time to work — 11 and 13 percent, respectively (ABAG, 2013).

TABLE 3.7-8
Average Travel Time to Work (2010)

County	One-Way Trip Duration (minutes)				
	1990	2000	2010	Change 1990-2010	Change 2000-2010
Alameda	25.8	30.8	27.4	+6%	-11%
Contra Costa	29.3	34.4	32.5	+11%	-6%
Marin	28.4	32.3	28.0	-1%	-13%
Napa	21.4	24.3	24.3	+14%	0%
San Francisco	26.9	30.7	30.3	+13%	-1%
San Mateo	24.0	27.0	24.5	+2%	-9%
Santa Clara	23.3	26.1	24.3	+4%	-7%
Solano	28.2	31.8	28.6	+1%	-10%
Sonoma	24.1	26.8	25.8	+7%	-4%
Total	**25.6**	**29.4**	**27.4**	**+7%**	**-7%**

Source: ABAG, 2013

A high proportion of Bay Area residents continue to commute outside their county of residence to jobs in other counties. Table 3.7-9 shows the number of workers who live and work in the same county as well as the number of residents who commuted to other counties for work from 1990 to 2010. In 1990, approximately 26 percent of the region’s workers commuted outside their resident county for work. This share has increased to nearly 28 percent by 2010. At the county level, Alameda, San Francisco, and Santa Clara counties all saw their share of resident workers commuting elsewhere increase between 1990 and 2010. The other counties saw an increasing number of resident workers working in their counties. The decentralization of regional job centers offers a partial explanation for this trend (ABAG, 2013).

Commuting into the Bay Area from counties outside of the regional also occurs. There are an estimated 116,000 workers (about 3.4 percent of employees) who currently commute into the Bay Area. In part, the existing in-commute can be explained by the significant difference in the median housing costs of the counties of origin for the commuters and the Bay Area counties in which they work. For example, some workers in the Bay Area currently commute into the region from San Joaquin County where the median housing price between 2006 and 2010 was $318,600, compared to $637,000 in the Bay Area region. Commuters that travel to the Bay Area for work may actually prefer to live outside of the Bay Area for various reasons (not just the reduced cost of housing) (ABAG, 2013).

TABLE 3.7-9

Bay Area Commutes Within and Between Counties

County	Live and Work in Same County			Live Here, Work Elsewhere			Resident Workers Commuting Out		
	1990	2000	2010	1990	2000	2010	1990	2000	2010
Alameda	446,000	454,000	460,244	187,000	225,000	218,090	30%	33%	32%
Contra Costa	240,000	255,000	276,776	161,000	187,000	186,956	40%	42%	40%
Marin	73,000	79,000	73,769	52,000	48,000	43,256	41%	38%	37%
Napa	38,000	44,000	48,248	13,000	13,000	13,062	25%	23%	21%
San Francisco	307,000	322,000	334,383	75,000	97,000	103,431	20%	23%	24%
San Mateo	202,000	206,000	213,589	145,000	148,000	139,095	42%	42%	39%
Santa Clara	710,000	728,000	703,011	86,000	101,000	109,663	11%	12%	13%
Solano	97,000	99,000	111,490	61,000	75,000	67,141	39%	43%	38%
Sonoma	156,000	184,000	182,501	35,000	41,000	36,514	18%	18%	17%
Total	**2,270,000**	**2,371,000**	**2,404,011**	**815,000**	**935,000**	**917,208**	**26%**	**28%**	**28%**

Source: ABAG, 2013

3.7.3 REGULATORY SETTING

3.7.3.1 Federal Regulations

3.7.3.1.1 Safe, Accountable, Flexible, and Efficient Transportation Equity Act; A Legacy for Users (SAFETEA-LU)

In 2005, the Safe, Accountable, Flexible, and Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU; Public Law 109–59) was signed into law. SAFETEA-LU provided funding for highways, highway safety, and public transportation. SAFETEA-LU addressed challenges such as improving safety, reducing traffic congestion, improving efficiency in freight movement, increasing intermodal connectivity, and protecting the environment. SAFETEA-LU also gave state and local transportation agencies more flexibility to solve transportation problems. SAFETEA-LU expired in 2009 but Congress extended the legislation; the most recent extension is known as Moving Ahead for Progress in the 21st Century (MAP-21). MAP-21, enacted in 2012, reauthorized most SAFETEA-LU highway, transit and Safety programs.

3.7.3.1.2 Moving Ahead for Progress in the 21st Century (MAP-21)

The Moving Ahead for Progress in the 21st Century Act (MAP-21) replaced SAFETEA-LU as the nation's surface transportation program. MAP-21was signed into law in July 2012 and reauthorized the federal highway and public transportation programs for fiscal years 2013 and 2014 for a total of $105 billion, holding funding flat relative to prior years. MAP-21 was intended to create a streamlined, performance-based, and multimodal program to address challenges facing the United States transportation system. These challenges include improving safety, maintaining infrastructure, reducing traffic congestion, improving efficiency of the system and freight movement, protecting the environment, and reducing delays in project delivery. However, the bill marks a notable departure from prior surface transportation acts in several respects, most notably its short duration, elimination of earmarks, consolidation of programs, and introduction of performance measures into the federal transportation policy framework. While the bill retains many of the larger highway and transit programs of its predecessor (SAFETEA-LU), it eliminates almost 100 smaller programs and distributes a much larger share of funds by formula (93 percent compared to 83 percent under SAFETEA).

3.7.3.1.3 Metropolitan Planning General Requirements

Under MAP-21, the U.S. Department of Transportation (USDOT) requires that metropolitan planning organizations, such as MTC, prepare long-range transportation plans (RTPs) and update them every four years if they are in areas designated as "nonattainment" or "maintenance" for federal air quality standards. Prior to enactment of MAP-21, the primary federal requirements regarding RTPs were included in the metropolitan transportation planning rules - Title 23 CFR Part 450 and 49 CFR Part 613. Key federal requirements for long range plans include the following:

- RTPs must be developed through an open and inclusive process that ensures public input; seeks out and considers the needs of those traditionally under served by existing transportation systems; and consults with resource agencies to ensure potential problems are discovered early in the RTP planning process;
- RTPs must be developed for a period of not less than 20 years into the future; RTPs must reflect the most recent assumptions for population, travel, land use, congestion, employment, and economic activity;
- RTPs must have a financially constrained element, transportation revenue assumptions must be reasonable, and the long range financial estimate must take into account construction-related inflation costs;
- RTPs must include a description of the performance measures and performance targets used in assessing the performance of the transportation system;
- RTPs must include a system performance report evaluating the condition and performance of the system with respect to performance targets adopted by the state that detail progress over time;
- RTPs may include multiple scenarios for consideration and evaluation relative to the state performance targets as well as locally-developed measures.
- RTPs must conform to the applicable federal air quality plan (State Implementation Plan or SIP), for ozone and other pollutants for which an area is not in attainment; and
- RTPs must consider planning factors and strategies in the local context.

Traffic management in the state of California is guided by policies and standards set at the state level by Caltrans and by local jurisdictions.

3.7.3.2 State Regulations

3.7.3.2.1 California Department of Transportation (Caltans)

Caltrans in conjunction with the California Highway Patrol (CHP) has created Transportation Management Centers (TMCs) to rapidly detect and respond to incidents while managing the resulting congestion. With the help of intelligent transportation system technologies, such as electronic sensors in the pavement, freeway call boxes, video cameras, ramp meter sensors, earthquake monitors, motorist cellular calls, and commercial traffic reports, as well as Caltrans highway crews, 911 calls and officers on patrol, the TMC provides coordinated transportation management for general commutes, special events and incidents affecting traffic. The TMCs are operated within each Caltrans district.

3.7.3.2.2 California Regional Transportation Plan Guidelines

California law relating to the development of the RTPs is primarily reflected in Government Code Section 65080. Pursuant to Government Code section 65080(d), MPOs, such as MTC, that are located in nonattainment areas must update their RTPs at least every four years. The RTP Guidelines require that an RTP addresses three distinct elements; a policy element, an action element, and a financial element. In addition, when applicable, RTPs shall be consistent with federal planning and programming requirements and shall conform to the RTP Guidelines adopted by the California Transportation Commission (CTC). The CTC cannot program projects that are not identified in the RTP. The CTC's RTP guidelines suggest that projections used in the development of an RTP should be based upon available data (such as from the Bureau of the Census), use acceptable forecasting methodologies, and be consistent with the Department of Finance baseline projections for the region.

The regional travel demand model guidelines are "scaled" to different sizes of MPO's. MTC is included in the "E" grouping of the MPO's serving the largest populations in the state. The guidelines for regional travel demand modeling are the most ambitious for the "E" group, and include (among many other things):

- Guidelines and standards for validation and sensitivity testing of the model;
- Transition to an activity-based demand model;
- Participate in peer review every 10 years; and
- Build a microeconomic land use model as soon as is practical.

3.7.3.2.3 Senate Bill 375

The Sustainable Communities and Climate Protection Act of 2008 (California Senate Bill 375) has diversified the areas of study from past RTPs to include land use impacts and climate change issues. Senate Bill 375 (SB 375) requires MPOs to prepare a Sustainable Communities Strategy (SCS) that demonstrates how the region will meet its greenhouse gas (GHG) reduction targets through integrated land use, housing and transportation planning. The SCS must identify a transportation network that is integrated with the forecasted development pattern for the plan area and will reduce GHG emissions from automobiles and light trucks in accordance with targets set by the California Air Resources Board. Pursuant to SB 375, ABAG and MTC adopted Plan Bay Area, the SCS for the Bay Area, in 2013.

3.7.3.2.4 Senate Bill 1339

Senate Bill 1339 authorizes MTC and the District to jointly adopt a commute benefit ordinance that requires major Bay Area employers to offer their employees certain types of commute benefits, such as pre-tax contributions towards public transit passes or commute shuttle services. The bill authorizes MTC and the District to implement the program through 2017, at which point state legislative action would be required to continue the ordinance. The Air District, through Rule 14-1, and MTC adopted the Commuter Benefit Program in 2014.

3.7.3.2.5 Changes to CEQA for Transit-Oriented Development

SB 743 codified the addition of Chapter 2.7, §21099 to the Public Resources Code (PRC) to provide for changes to CEQA for Transit-Oriented Development and establishes alternative metrics used for traffic levels of service (LOS) for transportation impacts inside transit priority areas. Key SB 743 language requires that the Office of Planning and Research develop guidelines for determining the significance of transportation impacts of projects within transit priority areas. Those criteria shall promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses. In developing the criteria, the office shall recommend potential metrics to measure transportation impacts that may include, but are not limited to, vehicle miles traveled, vehicle miles traveled per capita, automobile trip generation rates, or automobile trips generated. Once the guidelines are certified by the Secretary of the Natural Resources Agency, automobile delay, as described solely by level of service or similar measures of vehicular capacity or traffic congestion shall not be considered a significant impact on the environment.

On January 20, 2016, OPR released a revised proposal for changes to the CEQA Guidelines that will change the way that transportation impacts are analyzed under CEQA. The Guidelines propose to use VMT as the primary metric of transportation impacts across the state. The intent for using VMT as a criterion for measurement is to encourage good incremental, walkable, transit-accessible projects.

3.7.3.3 Local Regulations

3.7.3.3.1 Congestion Management Agency Transportation Plans

Each of the nine Bay Area counties has a Congestion Management Agency (CMA) designated to manage traffic congestion through implementation of multimodal transportation projects. These agencies work with MTC to advance road, bicycle, pedestrian, and transit projects in line with regional objectives. In addition, many CMAs develop county transportation plans that should be consistent with the Regional Transportation Plan adopted by MTC; many of these CMAs intend on updating their countywide plans following the adoption of Plan Bay Area. The most recent county transportation plans are listed below.

- Alameda County Transportation Commission: 2016 Alameda Countywide Transportation Plan;
- Contra Costa Transportation Authority: 2009 Countywide Comprehensive Transportation Plan (CTP) (an update of the CTP was released in 2014, but was not approved and is currently being revised);

- San Francisco County Transportation Authority: San Francisco Transportation Plan 2040;

- Santa Clara Valley Transportation Authority: 2014 Valley Transportation Plan 2040;

- Solano Transportation Authority: 2005 Comprehensive Transportation Plan 2030 (the 2040 CTP is being developed); and,

- Sonoma County Transportation Authority: 2009 Comprehensive Transportation Plan for Sonoma County (the draft 2040 CTP is currently in draft form).

The remaining three CMAs do not develop such plans on a regular basis, but they still play a major role in implementing regional transportation priorities:

- City/County Association of Governments of San Mateo County;

- Napa County Transportation and Planning Agency; and,

- Transportation Authority of Marin.

3.7.3.3.2 Local Agency General Plans

State law requires cities and counties to adopt general plans, which must include a transportation element. The transportation element describes the acceptable operating standards, levels of service, classifications, and transportation related goals of a given city or county; it is typically a multimodal section that addresses roads, public transit, bicycle facilities, and pedestrian facilities. This EIR does not explicitly identify localized traffic issues that might be the focus of a city's general plan; rather, it will deal with issues of overall system performance from a regional perspective.

3.7.4 SIGNIFICANCE CRITERIA

The proposed project impacts on transportation and traffic will be considered significant if:

- A major roadway is closed to all through traffic, and no alternate route is available.
- The project conflicts with applicable policies, plans or programs establishing measures of effectiveness, thereby decreasing the performance or safety of any mode of transportation.
- There is an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system.
- The demand for parking facilities is substantially increased.
- Water borne, rail car or air traffic is substantially altered.

- Traffic hazards to motor vehicles, bicyclists or pedestrians are substantially increased.

3.7.5 ENVIRONMENTAL IMPACTS

As noted previously, the proposed 2017 Plan sets forth a comprehensive roadmap for Air District actions over the next few years to reduce air pollution and protect public health and the global climate. The Plan includes a number of different types of proposed implementation actions to achieve these goals, including stationary-source regulatory measures to reduce emissions from industrial facilities and grant funding measures to incentivize voluntary emission-reducing activities, among others.

Regarding the Air District's proposed stationary-source regulatory measures, the District found in the Initial Study that the potential new regulations and amendments to existing regulations that are proposed in the 2017 Plan are not expected to result in any significant transportation/traffic impacts. These proposed regulatory actions are described in the Plan's stationary source control measures, SS1 through SS40. These actions are not expected to result in significant traffic impacts because they would require the installation and operation of additional pollution control equipment, primarily at industrial facilities such as refineries, power plants, and other similar facilities. These types of modifications are not expected to require additional employees to operate or generated substantial traffic during operations (Appendix A, p. 2-51). As these impacts were found not to be significant in the Initial Study, they are not evaluated further here.

Regarding grants and incentives measures, the District is also proposing to continue to use its grants and incentives programs to fund projects in furtherance of the Plan's goals of reducing air pollution and protecting public health and the global climate. As discussed previously, the District's grant programs include:

- The Transportation Fund for Clean Air, which funds cost-effective projects aimed at reducing on-road motor vehicle emissions in the Bay Area. These include shuttle bus and feeder bus services between transit hubs and commercial and employment centers, ridesharing and other trip reduction programs, bicycle projects such as bikeways and electronic bike lockers, and vehicle replacement projects that fund the replacement of older, higher-emitting vehicles with cleaner zero emission vehicles or partial zero emission vehicles.
- The Carl Moyer Program, which provides grants to upgrade or replace heavy-duty diesel vehicles and equipment such as trucks, school buses, agricultural equipment, marine vessels, and locomotives;
- The Mobile Source Incentive Fund, which provides grants to public and private sector for projects eligible for the Carl Moyer Program, vehicle scrappage and agricultural assistance programs, and for projects to reduce pollution from school buses; and

- The Goods Movement Program, which provides grants to upgrade or replace diesel freight movement equipment such as trucks, locomotives, harbor craft, and cargo handling equipment.

It is anticipated that some of the projects funded through these grants and incentives programs could affect the number, type, and concentration of vehicles circulating within the Bay Area. For example, the District may provide funds for shuttle or feeder routes to provide connections to transit hubs (TR2), which could add shuttle buses, vans, or other similar vehicles to local roadways. The District could also provide funds to support changes in the types of vehicles currently on the road, for example by funding an upgrade to lower-emission vehicles (TR14) and heavy duty trucks (TR18). Additionally, some projects could affect travel patterns that could increase or decrease the number of vehicles on the roads (TR7), or affect the location and concentration of vehicle traffic (TR4). For example, projects promoting alternatives to automobile travel (TR9), may reduce vehicle traffic in certain areas, while roadway modifications such as reducing automobile lanes to add bicycle lanes to a roadway could cause automobile traffic to shift to other routes, or to become more concentrated on certain routes. These changes could decrease automobile traffic in certain areas and increase it in other areas, depending on how exactly such projects are implemented. All of these actions have the potential to affect roadway traffic volumes and therefore congestion in the areas where they take place, at least to a certain degree.

However, the District found in the Initial Study that control measures in the 2017 Plan funded through the grants and incentives programs are not expected to substantially increase vehicle trips or VMT. These strategies that enhance alternative transportation modes to the automobile through transportation infrastructure improvements, mass transit improvements, increasing telecommunications products and services, enhanced bicycle and pedestrian facilities, etc., are expected to result in reducing traffic volumes and congestion.

In addition, some of the projects funded through these grants and incentives programs could require construction activity. For example, if there is construction associated with building bike paths, installation of electric vehicle charging stations, passenger rail improvements (TR4), and new or modified truck routes/corridors (TR18), construction activity could generate additional traffic along heavily travelled roadways, which may result in the following impacts:

- Temporary reduction in the level of service on major arterials;
- Temporary closure of a roadway or major arterial;
- Temporary closure of a railroad line;
- Temporary impact on businesses or residents within the construction area;
- Temporary or permanent removal of on-street parking; and,
- Conflicts with public transportation system (e.g., temporary removal of bus stops).

It is impossible at this time to predict with any degree of certainty exactly what types of projects the Air District will fund through its grants and incentive programs under the 2017 Plan, or where exactly these projects may be located. As transportation and land use projects are implemented, short-term construction impacts in and around construction zones maybe generated. Large numbers of construction projects occurring at the same time or one local area experiencing construction of many projects consecutively, could result in localized traffic delay impacts. Additional transit-oriented development in San Francisco, for example, would likely require street closures or partial street closures during construction. Because San Francisco is urbanized, street closures in many portions of the City could lead to significant traffic impacts. It is anticipated however, that implementation of the control measures would be phased in over many years, so any potential local impacts will not be consolidated in any one location or any one year. It is also anticipated that any potential construction impacts would be evaluated at the project level as more information about the timing, design, scope and construction schedule is available.

It is possible that the District may fund some projects that will require construction activities, and that such activities will generate traffic impacts, as outlined above. But it cannot be predicted at the Plan stage what construction activities may be required, or how, where, or when they may be carried out. As a result, the magnitude of any such construction projects, their location, the types of construction equipment required, the hours during which such activities may take place, potential for road or lane closures, and a host of other variables are currently not known. Until specific projects are proposed and funded by the District and these details are identified, it is simply not possible to say what level of traffic that may be generated, at what times and locations, and whether there may be substantial traffic impacts. As such, it is impossible to determine, beyond pure speculation, whether any traffic from any specific project funded under the 2017 Plan will be above or below the significance criteria.

CEQA Guidelines Section 15145 provides that "[i]f, after thorough investigation, a Lead Agency finds that a particular impact is too speculative for evaluation, the agency should note its conclusion and terminate discussion of the impact." That is the case here, as the extent of any potential traffic impacts from construction activities is too speculative for evaluation at this stage in the development and implementation of the 2017 Plan. As the discussion outlined above shows, it is not possible at this stage to determine – beyond mere speculation – the nature, extent, location, or timing of any construction activities that may result in traffic impacts from projects funded under the 2017 Plan, and therefore it is not possible to evaluate whether any such activities may generate a significant traffic impact. In such situations, CEQA does not contemplate an attempt to assess the significance of purely speculative traffic impacts in the EIR, as recognized in Section 15145 of the Guidelines. To the contrary, Section 15145 directs the analysis to conclude that there are no significant construction traffic impacts from any activities the District may fund through its grants and incentives programs under the 2017 Plan that can be identified at this stage of the development and implementation of the Plan.

This does not, of course, mean that there will not be any further consideration of the potential for significant traffic/transportation impacts at additional points in the future. To the contrary, traffic concerns will continue to be addressed as the District implements the 2017 Plan and it becomes clear what specific projects the District may support through its grants and incentives program. When specific projects are proposed, traffic concerns will be addressed under CEQA by the appropriate lead agencies taking action on the projects. At that point, the specific details about the project, including what types of activity will be required and what traffic that activity will generate, will be clear. The CEQA analysis will be able to conduct a full analysis of any potential traffic impacts, as the nature, extent, location, timing, and duration of the traffic impacts will be known. Moreover, as it will be clear exactly what project activities will be needed, it will be possible to incorporate specific mitigation measures at that point as necessary to avoid or lessen any significant impacts. This additional CEQA process will ensure that potential traffic concerns are fully addressed before any actual traffic-generating activity takes place. CEQA does not contemplate or require that such potential impacts be addressed at this Plan stage, where no details are known or available about any specific projects that may ultimately be funded under the Plan.

3.7.6 CUMULATIVE TRANSPORTATION IMPACTS

In addition to evaluating whether any action the District may take in implementing the proposed 2017 Plan will cause significant transportation/traffic impacts by itself, the EIR must also evaluate whether any District action may contribute to significant cumulative transportation/traffic impacts caused by other existing and reasonably foreseeable future activities. Specifically, CEQA Guidelines Section 15064(h) requires an evaluation of whether the District's implementation of the proposed 2017 Plan will result in any "cumulatively considerable" contribution to an existing (or reasonably foreseeable future) significant transportation/traffic impact. A significant cumulative traffic impact occurs where traffic levels from all projects at a given location (i.e., from all past, present, and reasonably foreseeable future projects) combine to result in cumulative transportation/traffic levels exceeding the applicable significance criteria.

The 2017 Plan does not include any specifically identified actions that would result in any "cumulatively considerable" contributions to any existing or reasonably foreseeable future traffic impacts. For Air District funding of potential air quality related projects through its grants and incentives programs, there are no specific projects that have been proposed or approved at this point, so it is not possible to determine whether any such projects may be located in an area where existing (or reasonably foreseeable future) traffic impacts may be generated. Nor is it possible to determine whether any project the District may fund would increase traffic to significant levels in such areas.

The District has considered the potential for the proposed 2017 Plan to contribute to cumulative traffic and transportation impacts with respect to all potential existing and reasonably foreseeable future activities in general. In doing so, the District has in particular considered the potential for other activities that could result from implementation of the Plan Bay Area, the Regional Transportation Plan and SB 375 Sustainable Communities Strategy adopted by MTC and ABAG. Implementation of the 2040 Plan Bay Area is expected to generate both significant and less than significant impacts on transportation and traffic. As a result of the Plan Bay Area, per-trip travel time for both commute and non-commute trips are not expected to substantially increase. While there is an expected three percent increase overall in per-trip travel time for commute trips, this is below the threshold (five percent) of significance. Furthermore, per-trip travel time, both for commute and non-commute, is expected to decrease for autos while the increase is seen in transit services due to increased utilization. Although there is an increased utilization of transit services, the overall increase is not expected to exceed the regional transit capacity. Even with the increased transit service utilization expected by 2040, rail services are projected to fill only 17 percent of total seat miles and adverse impacts are not generated until 80 percent or more total seat miles are used. Therefore, there are no adverse impacts expected on regional transit capacity (ABAG, 2013).

The 2040 Plan Bay Area is not expected to generate adverse impacts on per capita VMT in the region as a six percent decrease in per capita VMT is projected by 2040. However, the Plan Bay Area plan is expected to generate adverse impacts on per capita VMT on facilities experiencing level of service (LOS) F. VMT for LOS F facilities is projected to increase by 29 percent during AM peak periods, 71 percent for PM peak periods, and 51 percent overall thus creating a significant adverse impact. In order to mitigate impacts from increased per capita VMT, the MTC will pursue additional bridge tolls during peak periods, implement the regions commute benefit ordinance, and pursue implementation of ramp metering. The impacts on VMT where projected to remain significant after mitigation (ABAG, 2013).

The District has taken these potential Plan Bay Area traffic impacts into account in its cumulative impact analysis, as it has done with the potential for traffic from any and all other traffic-generating activities throughout the Bay Area generally. The 2017 Plan is not expected to result in any cumulatively considerable contributions to significant traffic impacts arising from Plan Bay Area for the same reasons that the 2017 Plan is not expected to result in any cumulatively considerable contributions to significant cumulative traffic impacts generally. For the 2017 Plan's proposed stationary source regulatory measures, these measures will primarily affect industrial facilities and require the installation of air pollution control equipment which is not expected to generate substantial traffic.

For elements of the 2017 Plan that call for the District to fund projects under its grants and incentives programs, the nature, extent, location and timing of any such projects are not known with any specificity at this point, and so it is not possible to assess whether any projects could be implemented in the vicinity of any Plan Bay Area activities such that they would combine to cause traffic impacts exceeding the significance criteria. Moreover, even if a District implementation action did take place in a location with a significant traffic impact resulting from a Plan Bay Area implementation action, it is not possible to determine whether any incremental contribution from the District's implementation of the 2017 Plan exceed the traffic significance thresholds (i.e., would make a "cumulatively considerable" contribution to a significant cumulative problem), as the nature, extent, and timing of any District implementation actions are not known, even if it is assumed that they could take place in an area significantly impacted by other traffic impacts.

Finally, for the District's technical support, educational and advocacy efforts called for under the proposed 2017 Plan, these activities do not involve any substantial traffic-generating activity themselves, and they do not directly result in any activity that could generate traffic, and so they are not expected to result in increases in existing (or reasonably foreseeable future) traffic levels. Moreover, although these efforts are expected to help agencies like MTC, ABAG, and local cities and counties implement Plan Bay Area more efficiently and effectively, they will not materially change how any actual transportation or land use development projects are built under Plan Bay Area in any way that will affect traffic levels associated with such projects. As such, these efforts will not be making any material contribution to any traffic impacts associated with such projects, which would occur anyway under Plan Bay Area with or without the District's technical support.

For all of these reasons, the proposed 2017 Plan is not expected to make any cumulatively considerable contribution to any existing (or reasonably foreseeable future) significant cumulative traffic or transportation impacts.

3.7.7 CONCLUSIONS

Based on the above analysis, the Air District concludes that the 2017 Plan will not result in any significant transportation impacts, individually or cumulatively, that must be addressed in this Program EIR. Although it is possible that certain activities the Air District could potentially fund through its grants and incentives programs could result in significant transportation impacts, there are no such impacts that are apparent at the Plan stage. These transportation concerns will be addressed by lead agencies approving any projects within their communities that may be funded by Air District grants and incentives.

CEQA requires mitigation measures to be implemented to avoid or minimize any significant impacts. As no significant traffic/transportation impacts have been identified, there is no requirement to implement any mitigation measures to avoid any significant traffic or transportation impacts.

The potential for traffic mitigation measures will be revisited at subsequent points in the process of implementing the 2017 Plan, as noted above. For example, with respect to any potential traffic impacts that may arise from specific projects that the District may fund through its grants and incentives programs, traffic impacts from such projects will be evaluated for each project by the appropriate lead agency when it is actually proposed and implemented. When the specific details of such projects are known, it will be possible to determine the extent of any traffic impacts and to develop mitigation measures to address any significant impacts. It would not be possible for the District to develop mitigation measures for any such projects at this point, before the details are known about the nature, extent, location, or timing of any potential traffic-generating activities that may be associated with such projects.

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CHAPTER 3.8 UTILITIES AND SERVICE SYSTEMS

3.8 UTILITIES AND SERVICE SYSTEMS

3.8.1 INTRODUCTION

The 2017 Plan is designed as a comprehensive roadmap for the District's efforts over the next few years to reduce air pollution and protect public health and the global climate. The Plan focuses in particular on reducing emissions of ozone-forming pollutants in order to fulfill state ozone air quality planning requirements; on protecting public health by reducing emissions of ozone-forming pollutants, fine particulate matter, and toxic air contaminants; and on developing a regional climate protection strategy by reducing greenhouse gas emissions from a wide variety of sources.

To implement the Plan, the District will draw on the full repertoire of tools and resources at its disposal. This repertoire includes the District's principal regulatory tool, which is its rulemaking authority granted to it under the California Health & Safety Code to adopt mandatory regulations requiring stationary-source facilities to take action to reduce their air emissions. It also includes the District's grants and incentives programs, which provide monetary incentives for implementing voluntary actions to reduce emissions. And it also includes the District's role in promoting sound policy development and healthy air quality choices throughout all sectors of our economy and society. This last tool encompasses efforts such as providing technical support to other agencies as they develop and implement their own policies and programs to help achieve clean air; promoting best practices by developing model ordinances, guidance documents, and the like; outreach and education efforts to engage with community groups and other organizations; and advocacy in support of legislative and regulatory action at the federal and state levels in order to promote the District's air quality, public health, and climate protection goals.

The specific actions and activities that the District is proposing to take to implement the 2017 Plan are set forth in the Plan's control strategy set forth in Chapter 5 of the Plan, and in the individual control measures that make up the control strategy outlined in detail in Volume 2 of the Plan. This chapter of the EIR evaluates these implementation actions and activities to determine whether they may result in any significant utilities and service system impacts.

The Initial Study (see Appendix A) evaluated the potential utilities and service systems impacts associated with implementation of the control measures in the 2017 Plan. The Initial Study determined that the control measures could require affected facilities to install air pollution control equipment which could generate solid and/or hazardous waste (spent catalyst, filters, spent carbon, etc.). In addition, some control measures in the 2017 Plan could increase energy demand by requiring additional air pollution controls and by accelerating the penetration of zero and near zero emission vehicles, trucks, buses, construction equipment, resulting in an increase in electricity demand. Therefore, this section of the EIR evaluates the potential impacts of the 2017 Plan on utilities and services systems.

It should be noted that the Initial Study also determined that water demand and the potential related impacts on water quality were potentially significant. The potential water demand and water quality impacts are addressed in Section 3.4 – Hydrology and Water Quality.

3.8.2 ENVIRONMENTAL SETTING

The Air District covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. Given the large area covered by the Air District, public utilities are provided by a wide variety of local agencies.

3.8.2.1 Electricity

Power plants in California provided approximately 66 percent of the total in-state electricity demand in 2015; of which 24.5 percent came from renewable sources such as biomass, solar, and wind power. The Pacific Northwest provided another 13 percent of total electricity demand and the remaining 21 percent was imported from the Southwest. (CEC, 2016b). The total system power used in California in 2015 was 295,405 GWh.

The contribution between in-state and out-of-state power plants depends upon, among other factors, the precipitation that occurred in the previous year and the corresponding amount of hydroelectric power that is available. The installed capacity of the 1,656 in-state power plants (greater than 0.1 megawatts - MW) totals 80,530 MW (CEC, 2016c). The Pittsburg Generating Station, located in Contra Costa County, is currently the only facility located within Air District jurisdiction that ranks within the top ten power generating facilities in California. Smaller power plants and cogeneration facilities are located throughout the Bay Area. Pacific Gas and Electric (PG&E) is the primary supplier of electricity to northern California, including the Bay Area.

When signed into law in 1996, the electricity market in California was restructured under Assembly Bill 1890 (AB 1890). Restructuring involved decentralizing the generation, transmission, distribution and customer services, which had previously been integrated into individual, privately-owned utilities. The objective of restructuring was to increase competition in the power generation business, while increasing customer choice through the Power Exchange. Additionally, the goal was to release control by privately-owned utilities of their transmission lines to a central operator called the Independent System Operator (ISO).

AB 1890 states the Legislature's intention that the State's publicly-owned utilities voluntarily give control of their transmission facilities to the ISO, just as is required of the privately-owned utilities. However, changes instituted by AB 1890 do not apply to them to the same extent as the privately-owned utilities. In-State power plants supply most of California’s electricity demand while power plants from the Pacific Northwest, and power plants in the southwestern U.S. provide for California's out-of-state needs. The majority of power generated in the Bay Area comes from plants located in Contra Costa County. The Pittsburg Generating Station, Delta Energy Center, and Marsh Landing Generating Center are the three largest power plants within Air District jurisdiction, providing 1302, 860, and 828 MW respectively and are fueled primarily by natural gas. There are three additional facilities that produce over 500 MW; The Russel City Energy Company Facility in Alameda (640 MW), the Gateway Generating Station located in Contra Costa (613 MW), and the Los Medanos Energy Center (594 MW). No other facilities within Air District jurisdiction provide over 250 MW of power (CEC, 2016c).

Local electricity distribution service is provided to customers within the Air District by privately-owned utilities such as PG&E. Many public-owned utilities, such as Alameda Power and Telecom, East Bay Municipal Utility District, Silicon Valley Power, and the Santa Clara Electric Department also provide service. PG&E is the largest electricity utility in the Bay Area, with a service area that covers all, or nearly all, of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma counties. PG&E provides over 90 percent of the total electricity demand in the Air District (CEC, 2015).

Table 3.8-1 shows the amount of electricity delivered to residential and nonresidential entities in the counties in the Air District in 2014.

TABLE 3.8-1
Bay Area Utility Electricity Consumption by County for 2014
(million kilowatt-hour – kWh)(1)

County	Non-Residential	Residential	Total
Alameda	7,422	2,878	10,299
Contra Costa	6,861	2,721	8,606
Marin	702	684	1,407
Napa	1,350	684	957
San Francisco	4,401	1,432	5,832
San Mateo	2,948	1,495	4,443
Santa Clara	12,840	3,831	16,671
Solano	2,208	1,005	3,213
Sonoma	1,661	1,282	2,943
		Total Electricity Consumption:	54,371

Source: CEC, 2016a

(1) All usage expressed in millions of kilowatt-hour (kWh): kWh is the most commonly used unit of measure telling the amount of electricity consumed over time. It means one kilowatt (1000 watts) of electricity supplied for one hour.

Additionally, the Oakley Generating Station, (2009-AFC-04C) located in Contra Costa County has been proposed and is currently on hold. The facility is expected have a 624 megawatt capacity once operational. There are no other facilities listed as pending construction or under review in the Air District's jurisdiction at this time (CEC, 2016d).

3.8.2.2 Solid/Hazardous Waste

3.8.2.2.1 Solid Waste

Permit requirements, capacity, and surrounding land use are three of the dominant factors limiting the operations and life of landfills. Landfills are permitted by the local enforcement agencies with concurrence from California's Department of Resources Recycling and Recovery (CalRecycle). Local agencies establish the maximum amount of solid waste which can be received by a landfill each day and the operational life of a landfill. Landfills are operated by both public and private entities.

There are three primary classes of landfill sites permitted to receive varying severity of waste materials. Class I sites are facilities that can accept hazardous waste as well as municipal solid waste, construction debris, and yard waste. Class II sites may receive certain designated waste along with municipal solid waste, construction debris, and yard waste. Class III sites can only accept non-hazardous waste, e.g., solid waste construction debris, wood and yard waste, and certain non-hazardous industrial waste.

A total of 15 Class III active landfills are located within the Air District with a total capacity of 44,296 tons per day (see Table 3.8-2) (CalRecycle 2016).

TABLE 3.8-2
Number of Class III Landfills Located within the Bay Area and Related Landfill Capacity(1)

County	Number of Landfills	Capacity (tons/day)
Alameda	2	14,018
Contra Costa	2	5,000
Marin	1	2,300
Napa	1	600
San Francisco	0	0
San Mateo	1	3,598
Santa Clara	5	9,550
Solano	2	6,730
Sonoma	1	2,500
TOTAL	**15**	**44,296**

(1) Sources: CalRecycle, 2016

3.8.2.2.2 Hazardous Waste

Hazardous material, as defined in 40 CFR 261.20 and 22 CCR Article 9, is disposed of in Class I landfills. California has enacted strict legislation for regulating Class I landfills. The California Health and Safety Code requires Class I landfills to be equipped with liners, a leachate collection and removal system, and a ground water monitoring system.

There are no hazardous waste disposal sites within the Bay Area. Hazardous waste generated at area facilities, which is not reused on-site, or recycled off-site, is disposed of at a licensed in-state hazardous waste disposal facility. Two such facilities in California are the Chemical Waste Management (CWM) Kettleman Hills facility in King's County, and the Laidlaw Environmental Services facility in Buttonwillow (Kern County).

The Kettleman Hill hazardous waste facility was permitted to increase its capacity by about five million cubic yards in May of 2014 (DTSC, 2014), therefore, the facility has a capacity of about five million cubic yards. CWM has also applied to the U.S. EPA to both renew and modify its existing permits to allow for the expansion of the landfill. The expansion would provide another 12-14 years of life. Kettleman Hills landfill is permitted to dispose of or treat and store hazardous waste from all over California. The facility accepts almost all solid, semi-solid, and liquid hazardous waste. However, Kettleman Hills landfill is not permitted to accept biological agents or infectious wastes, regulated radioactive materials, or compressed gases and explosives.

Buttonwillow is a 320-acre landfill operated by Clean Harbors Environmental Services Environmental Services and can accept in excess of 200 loads of waste per day. Typical waste streams include contaminated soils, hazardous waste for treatment of metals, plating waste, and hazardous and non-hazardous liquids. The permitted capacity at the Buttonwillow landfill is in excess of 10 million cubic. Clean Harbors is currently receiving waste and expected to continue to receive waste for an additional 70 years (Clean Harbors, 2014).

Hazardous waste also can be transported to permitted facilities outside of California. The nearest out-of-state landfills are U.S. Ecology, Inc., located in Beatty, Nevada; Laidlaw Environmental Services located in Lake Point, Utah; Envirosafe Services, in Grandview, Idaho; Chemical Waste Management Inc. in Carlyss, Louisiana, and Waste Control Specialists in Andrews, Texas. U.S. Ecology, Inc. is currently receiving waste, and is in the process of extending the operational capacity for an additional 35 years (Clean Harbors, 2015). Incineration is provided at Laidlaw Environmental Services, Inc., located in Deer Park, Texas.

The most common types of hazardous waste generated in the district include contaminated soils, waste oil and mixed oil, inorganic solid waste, organic solids, asbestos-containing waste, and unspecified oil-containing wastes (see Table 3.8-3). San Francisco generates the major portion of the hazardous waste generated in the Air District followed by Alameda County with contaminated soils being the most common hazardous waste generated in those two counties. Not all hazardous wastes generated are disposed of in a hazardous waste facility or incinerator. Many of the wastes generated, including waste oil, are recycled.

TABLE 3.8-3
Hazardous Waste Generation in the Bay Area 2015
(tons per year)

Waste Name	Alameda	Contra Costa	Marin	Napa(1)	San Francisco	San Mateo	Santa Clara	Solano	Sonoma(1)
Contaminated Soils from Site Clean-Up	83,218	16,789	62	90	256,676	2,503	26,168	1,288	983
Waste Oil and Mixed Oil	4,588	457	49	57	414	155	2,171	39,860	198
Other Inorganic Solid Waste	7,552	10,756	1,102	14	1,499	780	14,162	656	7,512
Blank / Unknown	446	422	9	28	85	45	6,805	13	33
Other Organic Solids	5,435	14,507	46	48	464	630	4,810	1,053	169
Unspecified Oil-Containing Waste	4,165	3,542	72	57	931	233	2,255	3,632	172
Asbestos-Containing Waste	2,931	2,019	576	293	3,450	1,600	3,928	471	419
Unspecified Solvent Mixture	524	672	38	8	114	10,270	14,194	88	212
Aq Sol (2 < ph < 12.5) W/ Org Residues < 10%	1,392	579	18	12	148	1,268	535	3,353	75
Unspecified Aqueous Solution (2 < ph < 12.5)	1,392	849	15	12	207	376	5,204	246	116
Aq Sol (2 < ph < 12.5) w/ Org Residues >= 10%	2,931	81	9	5	39	164	474	3,210	43
Unspecified Organic Liquid Mixture	1,161	1,747	40	30	176	416	1,159	386	73
Oil/Water Separation Sludge	4,453	3,417	61	5	531	85	201	219	13
Off-spec, Aged, or Surplus Organics	933	393	63	67	106	271	1,869	203	106
oxygenated solvents	1,136	173	10	5	18	297	704	165	139
Totals	**122,260**	**56,403**	**2,170**	**731**	**264,858**	**19,105**	**84,639**	**54,840**	**10,265**

Source: DTSC, 2016.
(1) Data presented is for the entire county and is not limited to the portion of the county within the Bay Area jurisdiction.

3.8.3 REGULATORY SETTING

3.8.3.1 Solid/Hazardous Waste

3.8.3.1.1 Federal Regulations

The U.S. EPA is the primary federal agency charged with protecting human health from pollution and with safeguarding the natural environment: air, water, and land. Since

1970, Congress has enacted numerous environmental laws including the Resource Conservation and Recovery Act (RCRA), CERCLA, and TSCA. 40 CFR, Part 258 Subtitle D of the RCRA establishes minimum location standards for siting municipal solid waste landfills. Because California laws and regulations governing the approval of solid waste landfills meet the requirements of Subtitle D, the U.S. EPA delegated the enforcement responsibility to the State of California.

Hazardous material, as defined in 40 CFR Part 261.20 and 22 CCR Article 9, is required to be disposed of in Class I landfills. California has enacted strict legislation for regulating Class I landfills. The California Health and Safety Code requires Class I landfills to be equipped with liners, a leachate collection and removal system, and a ground water monitoring system.

The Resource Conservation and Recovery Act (RCRA) gives the U.S. EPA the authority to control hazardous waste from the "cradle-to-grave." This includes the generation, transportation, treatment, storage, and disposal of hazardous waste by "large-quantity generators" (1,000 kilograms/month or more). Under RCRA regulations, hazardous wastes must be tracked from the time of generation to the point of disposal. At a minimum, each generator of hazardous waste must register and obtain a hazardous waste activity identification number. If hazardous wastes are stored for more than 90 days or treated or disposed at a facility, any treatment, storage, or disposal unit must be permitted under RCRA. Additionally, all hazardous waste transporters are required to be permitted and must have an identification number. RCRA allows individual states to develop their own program for the regulation of hazardous waste as long as it is at least as stringent as RCRA. In California, the U.S. EPA has delegated RCRA enforcement to the State of California.

The Hazardous Materials Transportation Act (HMTA) is the federal legislation regulating the trucks that transport hazardous wastes. The primary regulatory authorities are the U.S. Department of Transportation (DOT), the Federal Highway Administration (FHWA), and the Federal Railroad Administration (FRA). The HMTA requires that carriers report accidental releases of hazardous materials to the Department of Transportation at the earliest practicable moment (49 CFR Subchapter C, Part 171).

3.8.3.1.2 State Regulations

California Integrated Waste Management Act (AB 939): The California Integrated Waste Management Act of 1989 (AB 939) was enacted to reduce dependence on landfills as the primary means of solid waste disposal and to ensure an effective and coordinated approach to safe management of solid waste generated with California. AB 939 established a hierarchy of waste management practices that include: (1) source reduction; (2) recycling (or reuse) and composting; (3) transformation; and (4) environmentally safe transformation/land disposal. AB939 required disposal of waste by local jurisdictions be cut by 25 percent by 1995 and by 50 percent by 2000.

The Act requires the preparation of a Countywide Integrated Waste Management Plan (CIWMP), including a Siting Element that demonstrates a remaining landfill disposal capacity of at least 15 years to serve all jurisdictions in the county. The Countywide Siting Elements includes a combination of strategies to demonstrate adequate capacity, that may include existing, proposed, and tentative landfills or expansion; increased diversion efforts; and the export of solid waste for disposal. Source Reduction and Recycling Element (SRE), a Household Hazardous Waste Element, and Disposal Facility Element are also required as part of the CIWMP.

California Solid Waste Reuse and Recycling Act (CSWRRA, AB 2176). In 1991, the California Solid Waste Reuse and Recycling Act (CSWRRA) was enacted to assist local jurisdictions in accomplishing the goals set for in AB 939. AB 2176 requires that any development projects that have submitted an application for a building permit must also include adequate and accessible areas for the collection and loading of recyclable materials.

Title 27, California Code of Regulations: CalRecycle (formerly known as the California Integrated Waste Management Board (CIWMB)) has numerous responsibilities in implementing the federal and state regulations summarized above. CalRecycle is the state agency responsible for permitting, enforcing and monitoring solid waste landfills, transfer stations, material recovery facilities (MRFs), and composting facilities within California. Permitted facilities are issued Solid Waste Facility Permits (SWFPs) by CalRecycle. CalRecycle also certifies and appoints Local Enforcement Agencies (LEAs), county or city agencies which monitor and enforce compliance with the provisions of SWFPs. CalRecycle is also responsible for monitoring implementation of AB 939 by the cities and counties.

Solid Waste Diversion Rule (AB 341): In 2011, AB 341, directed CalRecycle to develop and adopt regulations to mandate commercial recycling. In 2012, the final regulation was approved and a policy goal declared that not less than 75 percent of solid waste generated be source reduced, recycled, or composted by the year 2020.

Prohibition on Local Disposal Limits (AB 845): AB 845 prohibits an ordinance enacted by a city or county from otherwise restricting or limiting the importation of solid waste into a privately owned solid waste facility in that city or county based on place of origin.

Engineered Municipal Solid Waste (AB1126): AB1126 was signed in September 28, 2013, and defines the terms “engineered municipal solid waste (EMSW) conversion” and “EMSW facility.” AB1126 stipulates that solid waste processed through an EMSW conversion facility would be consider disposal, and the energy generated by such a facility would not be considered renewable.

Reducing GHG Emissions in California (AB 32): As part of the California Global Warming Solutions Act of 2006, ARB was directed to adopt a Scoping Plan by 2009, which lays out initial measures needed to meet the 2020 target of reducing GHG emissions back to 1990 levels. The First Update to the Scoping Plan was released in 2014 stated that ARB and CalRecycle will work to eliminate landfill disposal of organic materials, a major source of GHG (methane).

Organic State Laws (AB1594 and 1826): On September 28, 2014, Governor Brown signed two bills into law that are intended to substantially reduce the amount of organic waste that is disposed in California landfills. AB194 states that for the purposes of complying with the waste diversion mandates of AB939, beginning January 1, 2020, the use of green waste will be considered disposal and not recycling. A jurisdiction must include information on how it intends to address compliance with the waste diversion mandates of AB939, beginning August 1, 2018. Jurisdictions which are not able to comply with AB 939 will be required to identify and address barriers to recycling green material, if sufficient capacity at organics waste recycling facilities is not available. AB 1826 requires jurisdictions to implement an organic waste recycling program for business that would include outreach, education, and monitoring of affected businesses by January 1, 2016.

Conversion Technology (SB 498): Governor Brown signed into law SB 498 on September 28, 2014, that requires 50 percent diversion of solid waste, of which 10 percent can come from transformation or biomass conversion. State law formerly limited "biomass conversion" to only the controlled combustion of organic materials, such as wood, lawn, and garden clippings, agricultural waste, leaves, tree pruning, and non-recyclable producing electricity or heat. SB 498 expanded the definition of biomass conversion to include non-combustion thermal conversion technologies. By doing so, SB 498 allows for the cleaner and more efficient non-combustion conversion technologies to be used to convert biomass into fuels and products in addition to heat and/or electricity.

RCRA: Authority for the statewide administration and enforcement of RCRA rests with the California Environmental Protection Agency's (Cal/EPA) Department of Toxic Substances Control (DTSC). While the DTSC has primary State responsibility in regulating the generation, transfer, storage and disposal of hazardous materials, DTSC may further delegate enforcement authority to local jurisdictions. In addition, the DTSC is responsible and/or provides oversight for contamination cleanup, and administers state-wide hazardous waste reduction programs. DTSC operates programs to accomplish the following: (1) deal with the aftermath of improper hazardous waste management by overseeing site cleanups; (2) prevent releases of hazardous waste by ensuring that those who generate, handle, transport, store, and dispose of wastes do so properly; and (3) evaluate soil, water, and air samples taken at sites. The DTSC conducts annual inspections of hazardous waste facilities. Other inspections can occur on an as-needed basis.

The Hazardous Waste Control Act (HWCA) created the State hazardous waste management program, which is similar to but more stringent than the federal RCRA program. The act is implemented by regulations contained in Title 26 of the CCR, which describes the following required aspects for the proper management of hazardous waste: identification and classification; generation and transportation; design and permitting of recycling, treatment, storage, and disposal facilities; treatment standards; operation of facilities and staff training; and closure of facilities and liability requirements. These regulations list more than 800 materials that may be hazardous and establish criteria for identifying, packaging, and disposing of such waste. Under the HWCA and Title 26, the generator of hazardous waste must complete a manifest that accompanies the waste from generator to transporter to the ultimate disposal location. Copies of the manifest must be filed with DTSC.

Hazardous Waste Source Reduction and Management Review Act of 1989: The Act requires generators of 12,000 kilograms/year of typical/operational hazardous waste to conduct an evaluation of their waste streams every four years and to select and implement viable source reduction alternatives. This Act does not apply to non-typical hazardous waste (such as asbestos and polychlorinated biphenyls).

3.8.3.1.3 Local Regulations

A Summary Plan is a solid waste planning document required by Public Resources Code § 41751, in which counties or regional agencies provide an overview of significant waste management problems faced by the jurisdiction, along with specific steps to be taken, independently and in concert with cities within their boundaries to achieve the 50 percent waste diversion mandate (LADPW, 2015).

As discussed above, each county is required to prepare and administer a CIWMP. In addition, each city and county is required to prepare, adopt and submit to the CalRecycle a Household Hazardous Waste Element which identifies a program for the safe collection, recycling, treatment, and disposal of hazardous wastes that are generated by households. The Household Hazardous Waste Element specifies how household hazardous wastes generated within the jurisdiction must be collected, treated, and disposed. An adequate Household Hazardous Waste Element contains the following components: Evaluation of alternatives, program selection, funding, implementation schedule and education and public information.

Each city and county is required to prepare, adopt and submit to the CalRecycle, a Non-Disposal Facility Element which includes a description of new facilities and expansion of existing facilities, and all solid waste facility expansions (except disposal and transformation facilities) that recover for reuse at least five percent of the total volume.

Fire Departments and other agencies in the district have a variety of local laws that regulate reporting, storage and handling of hazardous materials and wastes.

The Unified Hazardous Waste and Hazardous Materials Management Regulatory Program (Unified Program): The Unified Program required the administrative consolidation of six hazardous materials and waste programs (Program Elements) under one agency, a Certified Unified Program Agency (CUPA). The Program Elements consolidated under the Unified Program are: Hazardous Waste Generator and On-site Hazardous Waste Treatment Programs (a.k.a. Tiered Permitting); Aboveground Petroleum Storage Tank Spill Prevention Control and Countermeasure Plan (SPCC); Hazardous Materials Release Response Plans and Inventory Program (a.k.a. Hazardous Materials ARP); Underground Storage Tank (UST) Program; and Uniform Fire Code Plans and Inventory Requirements. The Unified Program is intended to provide relief to businesses complying with the overlapping and sometimes conflicting requirements of formerly independently managed programs. The Unified Program is implemented at the local government level by CUPAs. Most CUPAs have been established as a function of a local environmental health or fire department. Some CUPAs have contractual agreements with another local agency, a participating agency, which implements one or more Program Elements in coordination with the CUPA.

3.8.3.2 Energy

3.8.3.2.1 Federal Regulations

Federal and state agencies regulate energy use and consumption through various means and programs. On the federal level, the United States Department of Transportation (U.S. DOT), United States Department of Energy (U.S. DOE), and United States Environmental Protection Agency (U.S. EPA) are three agencies with substantial influence over energy policies and programs. Generally, federal agencies influence transportation energy consumption through establishment and enforcement of fuel economy standards for automobiles and light trucks, through funding of energy related research and development projects, and through funding for transportation infrastructure projects.

Energy Policy and Conservation Act, and CAFE Standards: The Energy Policy and Conservation Act (EPCA) of 1975 established nationwide fuel economy standards in order to conserve oil. Pursuant to this Act, the National Highway Traffic and Safety Administration, part of the U.S. Department of Transportation, is responsible for revising existing fuel economy standards and establishing new vehicle fuel economy standards. The Corporate Average Fuel Economy (CAFE) program was established to determine vehicle manufacturer compliance with the government's fuel economy standards. Compliance with CAFÉ standards is determined based on each manufacturer's average fuel economy for the portion of their vehicles produced for sale in the United States. The U.S. EPA calculates a CAFE value for each manufacturer based on city and highway fuel economy test results and vehicle sales. The CAFE values are a weighted harmonic average of the EPA city and highway fuel economy test results. Based on information generated under the CAFE program, the U.S. Department of Transportation is authorized to assess penalties for noncompliance. Under the Energy Independence and Security Act of 2007 (described below), the CAFE standards were revised for the first time in 30 years.

Energy Policy Act of 1992 (EPACT92): EPACT92 is comprised of twenty-seven titles. It was passed by Congress and set goals, created mandates, and amended utility laws to increase clean energy use and improve overall energy efficiency in the United States. EPACT92 established regulations requiring certain federal, state, and alternative fuel provider fleets to build an inventory of alternative fuel vehicles. EPACT92 was amended several times in the Energy Conservation and Reauthorization Act of 1998 and in 2005 via the Energy Policy Act in 2005, which emphasized alternative fuel use and infrastructure development.

Energy Policy Act of 2005: The Energy Policy Act of 2005 addresses energy efficiency; renewable energy requirements; oil, natural gas and coal; alternative-fuel use; tribal energy, nuclear security; vehicles and vehicle fuels, hydropower and geothermal energy, and climate change technology. The Act provides revised annual energy reduction goals (two percent per year beginning in 2006), revised renewable energy purchase goals, federal procurement of Energy Star or Federal Energy Management Program-designated products, federal green building standards, and fuel cell vehicle and hydrogen energy system research and demonstration.

Energy Independence and Security Act of 2007 (EISA): The EISA of 2007 was signed into law on December 19, 2007. The objectives of the Act are to move the United States toward greater energy independence and security, increase the production of clean renewable fuels, protect consumers, increase the efficiency of products, buildings and vehicles, promote greenhouse gas research, improve the energy efficiency of the Federal government, and improve vehicle fuel economy.

The renewable fuel standard in EISA requires 36 billion gallons of ethanol per year by 2022, with corn-based ethanol limited to 15 billion gallons. The CAFE standard for light duty vehicles is 35 miles per gallon by 2020. EISA also specifies that vehicle attribute-based standards are to be developed separately for cars and light trucks. EISA creates a CAFE credit and transfer program among manufacturers and across a manufacturer's fleet. It would allow an extension through 2019 of the CAFE credits specified under the Alternative Motor Fuels Act. It established appliance energy efficiency standards for boilers, dehumidifiers, dishwashers, clothes washers, external power supplies, commercial walk-in coolers and freezers, federal buildings; lighting energy efficiency standards for general service incandescent lighting in 2012; and standards for industrial electric motor efficiency.

Heavy-Duty National Program: The Heavy-Duty National Program was adopted on August 9, 2011, to establish the first fuel efficiency requirements for medium- and heavy-duty vehicles beginning with the model year 2014.

3.8.3.2.2 State Regulations

On the state level, the California Public Utilities Commission (CPUC) and California Energy Commission (CEC) are two agencies with authority over different aspects of energy. The CPUC regulates privately-owned electric, natural gas, telecommunications, water, railroad, rail transit, and passenger transportation companies. The CEC collects and analyzes energy-related data; forecasts future energy needs; promotes energy efficient and conservation by setting appliance and building energy efficiency standards; supports energy research; develops renewable energy resources, promotes alternative and renewable transportation fuels and technologies; certifies thermal power plants 50 megawatts and larger; and plans for and directs state response to energy emergencies. Some of the more relevant federal and state transportation-energy-related laws and plans are discussed in the following subsections.

California Building Energy Efficiency Standards (24): California established statewide building energy efficiency standards following legislative action. The legislation required the standards to be cost-effective based on the building life cycle and to include both prescriptive and performance-based approaches. The 2005 Building Energy Efficiency Standards were first adopted in November 2003, and took effect October 1, 2005. Subsequently the standards have undergone two updates, one in 2008 and one in 2013. The 2013 Building Energy Efficiency Standards went into effect on July 1, 2014. The 2016 Standards, which will go into effect on January 1, 2017, will continue to improve upon the current 2013 Standards for new construction of, and additions and alterations to, residential and nonresidential buildings.

The 2013 Standards focus on several key areas to improve the energy efficiency of newly constructed buildings and additions and alterations to existing buildings, and include requirements that will enable both demand reductions during critical peak periods and future solar electric and thermal system installations.

AB 1007 – Alternative Fuels Plan: The Alternative Fuels Plan adopted in 2007 by the State Energy Resources Conservation and Development Commission and ARB as required under state law, AB 1007, recommends that the governor set targets on a gasoline gallon equivalent basis for use of ten different alternative motor fuels in the on-road and off-road sectors by nine percent by 2012, 11 percent by 2017, and 26 percent by 2022. These goals will require a dramatic expansion in the use of such fuels as electricity, compressed natural gas, hydrogen, renewable diesel, bio-diesel and ethanol in motor vehicles. Also built into the Alternative Fuels Plan is a multi-part strategy to develop hybrid and electric vehicle technologies; build the infrastructure to deliver the alternative fuels; increase the blending of more biofuels into gasoline and diesel; improve the fuel efficiency of vehicles; and reduce vehicle miles traveled by California motorists with more effective land use planning.

California Solar Initiative: On January 12, 2006, the CPUC approved the California Solar Initiative (CSI), which provides $2.9 billion in incentives between 2007 and 2017.

CSI is part of the Go Solar California campaign, and builds on 10 years of state solar rebates offered to California's IOU territories: Pacific Gas & Electric (PG&E), Southern California Edison (SCE), and San Diego Gas & Electric (SDG&E.) The California Solar Initiative is overseen by the CPUC, and includes a $2.5 billion program for commercial and existing residential customers, funded through revenues and collected from gas and electric utility distribution rates. Furthermore, the CEC managed $350 million targeted for new residential building construction, utilizing funds allocated to the CEC that fostered renewable projects between 2007 and 2011.

Current incentives provide an upfront, capacity-based payment for a new system. In its August 24, 2006 decision, the CPUC shifted the program from volume-based to performance-based incentives and clarified many elements of the program's design and administration. These changes were enacted in 2007.

AB 2514 – Energy Storage Systems: This bill requires the CPUC to adopt an energy storage system procurement target, if determined to be appropriate, to be achieved by each load-serving entity by December 31, 2015, and a 2nd target to be achieved by December 31, 2020. The bill would require the governing board of a local publicly owned electric utility to adopt an energy storage system procurement target, if determined to be appropriate, to be achieved by the utility by December 31, 2016, and a second target to be achieved by December 31, 2021. The bill would require each load-serving entity and local publicly owned electric utility to report certain information to the CPUC, for a load-serving entity, or to the Energy Commission, for a local publicly owned electric utility.

Executive Order B-16-2012: Executive Order B-16-2012 establishes long-term targets of reaching 1.5 million ZEVs on California's roadways by 2025 and sets ZEV purchasing requirements for State Government fleets. Executive Order B-16-2012 also sets a target for 2050 of a reduction of GHG emissions from the transportation sector equaling 80 percent less than 1990 levels. In February 2013, an interagency working group developed the ZEV Action Plan, which identifies specific strategies and actions that State agencies will take to meet the milestones of the Executive Order. The ZEV Action Plan states: *"ZEVs are crucial to achieving the state's 2050 greenhouse gas goal of 80 percent emission reductions below 1990 levels, as well as meeting federal air quality standards. Achieving 1.5 million ZEVs by 2025 is essential to advance the market and put the state on a path to meet these requirements."*

Renewables Portfolio Standard: California's renewables portfolio standard (RPS) requires retail sellers of electricity to increase their procurement of eligible renewable energy resources by at least one percent per year so that 20 percent of their retail sales are procured from eligible renewable energy resources by 2017. If a seller falls short in a given year, they must procure more renewables in succeeding years to make up the shortfall. Once a retail seller reaches 20 percent, they need not increase their procurement in succeeding years. RPS was enacted via SB 1078, signed in September 2002. The CEC and the CPUC are jointly implementing the standard. In 2006, RPS was modified by Senate Bill 107 to require retail sellers of electricity to reach the 20 percent renewables goal by 2010. In 2011, RPS was further modified by Senate Bill 2 to require retailers to reach 33 percent renewable energy by 2020.

California Senate Bill 350: SB 350 was approved on October 7, 2015. SB 350 will: (1) increase the standards of the California RPS program by requiring that the amount of electricity generated and sold to retail customers per year from eligible renewable energy resources be increased to 50 percent by December 31, 2030; (2) require the State Energy Resources Conservation and Development Commission to establish annual targets for statewide energy efficiency savings and demand reduction that will achieve a cumulative doubling of statewide energy efficiency savings in electricity and natural gas final end uses of retail customers by January 1, 2030; (3) provide for the evolution of the Independent System Operator (ISO) into a regional organization; and (4) require the state to reimburse local agencies and school districts for certain costs mandated by the state through procedures established by statutory provisions. Among other objectives, the Legislature intends to double the energy efficiency savings in electricity and natural gas final end uses of retail customers through energy efficiency and conservation.

Executive Order B-18-12: Executive Order B-18-12 was signed into law on April 25, 2012 directing state agencies to reduce their grid-based energy purchases by at least 20 percent by 2018, as compared to a 2003 baseline. Pursuant to Executive Order B-18-12, all new state buildings and major renovations beginning design after 2025 shall be constructed as Zero Net Energy facilities with an interim target for 50 percent of new facilities beginning design after 2020 to be Zero Net Energy. State agencies shall also take measures toward achieving Zero Net Energy for 50 percent of the square footage of existing state-owned building area by 2025 and reduce water use by 20 percent by 2020. Additionally, the following measures relevant to energy are required:

- Any proposed new or major renovation of state buildings larger than 10,000 square feet shall use clean, on-site power generation, such as solar photovoltaic, solar thermal and wind power generation, and clean back-up power supplies, if economically feasible;

- New or major renovated state buildings and build-to-suit leases larger than 10,000 square feet shall obtain LEED "Silver" certification or higher, using the applicable version of LEED;

- New and existing buildings shall incorporate building commissioning to facilitate improved and efficient building operation; and,

- State agencies shall identify and pursue opportunities to provide electric vehicle charging stations, and accommodate future charging infrastructure demand, at employee parking facilities in new and existing buildings.

3.8.3.2.3 Local Regulations

The U.S. DOE Clean Cities Program promotes voluntary, locally based government/industry partnerships for the purpose of expanding the use of alternatives to gasoline and diesel fuel by accelerating the deployment of alternative fuel vehicles and building a local alternative fuel vehicle refueling infrastructure. The mission of the Clean Cities Program is to advance the nation's energy security by supporting local decisions to adopt practices that contribute to the reduction of petroleum consumption. Clean Cities carries out this mission through a network of more than 80 volunteer coalitions, which develop public/private partnerships to promote alternative fuels and vehicles, fuel blends, fuel economy, hybrid vehicles, and idle reduction.

3.8.4 SIGNIFICANCE CRITERIA

The impacts to utilities/service systems will be considered significant if any of the following criteria are met:

The proposed project impacts on utilities/service systems will be considered significant if:

- An increase in demand for utilities impacts the current capacities of the electric utilities.
- The generation and disposal of hazardous and non-hazardous waste exceeds the capacity of designated landfills.

The impacts for electricity and solid/hazardous wastes are discussed in separate subsections below. The impacts on water demand are addressed in Section 3.6 – Hydrology and Water Quality.

3.8.5 ENVIRONMENTAL IMPACTS

As noted previously, the proposed 2017 Plan sets forth a comprehensive roadmap for Air District actions over the next few years to reduce air pollution and protect public health and the global climate. The Plan includes a number of different types of proposed implementation actions to achieve these goals, including stationary-source regulatory measures to reduce emissions from industrial facilities and grant funding measures to incentivize voluntary emission-reducing activities, among others.

Regarding the Air District's proposed stationary-source regulatory measures, the District found in the Initial Study that some of the control measures could result in the installation of additional air pollution control equipment that would increase electricity use. Table 3.8-4 provides estimates of electricity demand associated with the various control measures including installation of new air pollution control equipment, as well as electrification of other types of control measures (e.g., lawn care equipment and shore power for vessels at berth).

TABLE 3.8-4
Potential Increase Electricity Demand Associated with 2017 Plan

Facility	No. of Units	Potential Increased Electricity Demand (kWh/day)	Potential Increase Instantaneous Electricity Demand (MW)
WGS at Refineries(1)	5	3,575	0.15
WGS at Sulfuric Acid Plant(2)	3	28,977	1.25
SCRs(3)	10	6,080	0.30
Caustic Soda Manufacture(4)	--	36,000	1.62
Lawn Care Equipment	26,000	26,000	1.04
Shore Power for Marine Vessels(6)	--	600,000	30
TOTAL ELECTRICAL USE		**700,632**	**34.36**

(1) SCAQMD, 2007. Final EIR for ConocoPhillips Los Angeles Refinery PM10 and NOx Reduction Project, SCH No. 2006111138
(2) SCAQMD, 2011. CEQA Evaluation of the Rhodia Inc. Wet Gas Scrubber/SOx RECLAIM Project.
(3) SCAQMD, 2015. Program Environmental Assessment for Proposed Amended Regulation XX – Regional Clean Air Incentives Market (RECLAIM). SCH No. 2014121018.
(4) SCAQMD, 2015. Calculated assuming it takes approximately 2,500 kWh to produce on metric ton of caustic (sodium hydroxide). Refinery WGS are assumed to use 4.800 lbs of caustic per day and WGS at sulfuric acid plants are assumed to use 2,600 lbs per day for a total of 31,800 lbs/day or about 14 tons per day in the District.
(5) BAAQMD 2017 Clean Air Plan. Assumes the conversion of 2,000 pieces of equipment per year through 2030. Based on 200 days/year operation at 1 kWh.
(6) Based on Port of Los Angeles, 2014 that assumes implementation of ARB's At-Berth Regulation would increase peak electricity demand by 30 MW.

In 2007, ARB approved the At-Berth Regulation, which requires vessel operators to reduce emissions at California ports by shutting off auxiliary engines and connecting to grid power, referred to as Alternative Maritime Power (AMP), or using alternative control measures. The regulation sets targets for 50 percent of vessels to use AMP by 2014 and 80 percent by 2020. Increased use of AMP is projected to grow peak electricity demand by 30 MW by 2020. This information was used to estimate increased electricity demand from marine vessels using shore power.

Between March 2011 and July 2015 more than 146,000 electric vehicles were sold in California, with about 2,248 public charging stations operating throughout California (CEC, 2016d). Assuming about 0.01 gigawatts per hour (GWh), the total electricity used by vehicles in California was about 1,460 GWh. The CEC projects 1.5 million electric vehicles by 2025, in support of the Executive Order by Governor Brown to encourage zero-emission vehicles by 2025. Plan Bay Area and ARB's SIP Strategy are expected to encourage the use of additional electric vehicles. In addition, the 2010 Clean Air Plan already called for promoting electric vehicles, and this program would continue with the 2017 Plan.

The projected increase in electricity associated with implementation of the 2017 Plan is summarized in Table 3.8-4 and estimated to be 700,632 kWh or 0.7 million kWh. The estimated baseline electricity use in the Bay Area is 54,371 million kWh (see Table 3.8-1). The increased use of electricity during operation is about 0.0012 percent of the existing electricity demand in the Bay Area. It should be noted that most of the refineries and some of the other stationary sources own/operate cogeneration units and generate electricity onsite which would help minimize impacts to electricity providers. Most of them also receive electricity from public providers as well. As discussed in Section 3.8.3 electricity providers are moving towards compliance with California's RPS and are required to generate 50 percent of their electricity from renewable energy resources by 2030 so modifications to existing electricity generating facilities and new generating facilities are expected to be implemented in the near future to comply with state RPS regulations.

It should also be noted that in addition to control measures that may result in an increase in electricity, the 2017 Plan also includes a number of measures that are aimed at energy efficiency and are expected to result in decreases in electricity use including: BL1 – Green Buildings; BL2 – Decarbonize Buildings; BL4 – Urban Heat Island; and EN2 - Decrease Electricity Demand. The method in which these control measures would be implemented is speculative and the potential energy benefits are unknown so no electricity reduction can be quantified at this time.

The increase in electricity associated with the 2017 Plan is expected to be much less than one percent of the existing electrical demand and is not expected to exceed the current capacity of the electric utilities in the Bay Area or create significant impacts on regional electricity supplies or on requirements for additional electricity. Therefore, the 2017 Plan impacts on electricity supply are less than significant.

3.8.5.1 Solid/Hazardous Waste Impacts

While the goal of the 2017 Plan is to improve air quality, some control measures have the potential to increase the generation of solid/hazardous wastes. Some air pollution control equipment may create cross-media impacts by removing pollutants from exhaust streams, which produce liquid or solids wastes that may require further treatment or disposal. Specifically, hazardous and non-hazardous waste may be generated by some types of air pollution control equipment such as electrostatic precipitators, carbon adsorption devices, wet gas scrubbers, baghouses, and filtration equipment. Other control measures may encourage early retirement of equipment and generate waste materials, e.g., TR 23 – Lawn and Garden Equipment. The analysis of solid/hazardous waste impacts assumes that safety and disposal procedures required by various agencies in the State of California will provide reasonable precautions against the improper disposal of hazardous wastes in a municipal waste landfill. Because of State and federal requirements, some facilities are attempting to reduce or minimize the generation of solid and hazardous waste by incorporating source reduction technologies to reduce the volume or toxicity of waste generated, including improving operating procedures, using less hazardous or non-hazardous substitute materials, and upgrading or replacing inefficient processes.

3.8.5.1.1 Potential Solid Waste Impacts due to Air Pollution Control Technologies

Construction activities associated with installing air pollution control equipment, especially large equipment e.g., wet gas scrubbers, could generate solid waste due to demolition and site preparation/grading/excavating. Specifically, demolition activities could generate demolition waste while site preparation, grading, and excavating could uncover contaminated soils since the facilities affected by the proposed project that would require additional air pollution control equipment are located in existing industrial or commercial areas. Excavated soil, which if it is found to be contaminated, would need to be characterized, treated, and disposed of offsite in accordance with applicable regulations. Where appropriate, the soil can be recycled if it is considered or classified as non-hazardous waste or it can be disposed of at a landfill that accepts non-hazardous waste. Otherwise, the material will need to be disposed of at a hazardous waste facility.

Solid or hazardous wastes that may be generated from construction-related activities would consist primarily of materials from the demolition of existing air pollution control equipment and construction associated with new or modified air pollution control equipment. Construction-related waste would be disposed of at a Class II (industrial) or Class III (municipal) landfill. There are 15 Class III landfills within the Bay Area. Based on a search of the Cal Recycle's (formerly the California Integrated Waste Management Board) Solid Waste Information System (SWIS), the landfills that accept construction waste in the Bay Area have a combined disposal capacity of approximately 44,296 tons, which is expected to be sufficient capacity to handle the one-time waste that may be generated from construction activities.

Proposed control measures in the 2017 Plan may have potential impacts on solid waste due to the addition of pollution control equipment that may need disposal and replacement (e.g., SS11 – Petroleum Refining Facility-Wide Emission Limits; SS20 – Air Toxics Risk Cap and Reduction from Existing Facilities; and SS21 – New Source Review for Toxics). It is difficult to quantify the number of facilities that would employ these types of equipment, the rate of disposal necessary to maintain the equipment, type of waste generated by the equipment (i.e., hazardous or non-hazardous) and the timing by which these technologies would come into use.

Particulate Traps, Filters, Baghouses, and Precipitators

While it is speculative to identify the number of facilities and the quantity of equipment that would utilize filters, particulate traps, precipitators and baghouses, the quantity of particulate matter collect on filters and from electrostatic precipitators is expected to be small. Proposed control measures in the 2017 Plan may have potential impacts on solid waste due to the addition of particulate traps and filters including SS11 – Petroleum Refining Facility-Wide Emission Limits; SS20 – Air Toxics Risk Cap and Reduction from Existing Facilities; and SS21 – New Source Review for Toxics. It is difficult to quantify the number of facilities that would employ these types of equipment, the rate of disposal necessary to maintain the equipment, type of waste generated by the equipment (i.e., hazardous or non-hazardous) and the timing by which these technologies would come into use.

Baghouses, pre-filters, filters, electrostatic precipitators, and HEPA filters collect particulate emissions from stationary and mobile sources of particulate emissions. These types of filtration control equipment can effectively remove particulate matter, including heavy metals, asbestos, as well as other toxic and nontoxic compounds. The diesel particulate filter system consists of a filter positioned in the exhaust stream designed to collect a significant fraction of the PM emissions while allowing the exhaust gases to pass through the system and are effective in removing DPM from exhaust gases. Polytetrafluoroethylene (PTFE) membranes or HEPA filters can increase a system's removal efficiency up to 99.9 percent. In general, as particulate size decreases, the surface area to volume ratio increases, thus, increasing the capacity of these filters to adsorb smaller particles (including hazardous materials). An increase in the use of membranes and filters may result in an incremental increase in solid waste requiring disposal in landfills over what would be produced if the 2017 Plan were not adopted. In some cases, waste generated may be hazardous (e.g., the collection of toxic emissions). The increase in the amount of waste generated from the use of filters and the collection of additional particulate matter are expected to be small, because filtration control equipment is already used in practice or required by existing rules, especially for stationary sources. Control measures that may include filtration control equipment will generally require increased control efficiencies and/or better housekeeping and maintenance requirements for the filtration devices. As a result the incremental amount of material collected by filters is expected to be small. Further, the larger filters used in baghouses are cleaned and reused so minimal additional waste would be expected from filters themselves.

Filters/baghouses/precipitators and the associated waste that are considered solid waste (i.e., not hazardous) could be disposed of at a number of landfills in northern California. The permitted capacity of the landfills in the Bay Area is about 44,300 tons per day (see Table 3.8-2) and have sufficient capacity to handle the small increase in waste.

There are no hazardous waste landfills within the Bay Area. Hazardous waste can be transported to permitted facilities both within and outside of California. Hazardous waste is expected to be transported to Clean Harbors in Buttonwillow, California. The permitted capacity at the Buttonwillow landfill is in excess of 10 million cubic yards so it would have sufficient capacity to handle the small amounts of waste that could be generated by filters/baghouses (Clean Harbors, 2015). The nearest out-of-state hazardous waste landfills are U.S. Ecology, Inc., located in Beatty, Nevada and Clean Harbors in Grassy Mountain, Utah. U.S. Ecology, Inc. is currently receiving waste, and is in the process of extending the operational capacity for an additional 35 years (U.S. Ecology, 2015). Clean Harbors is currently receiving waste and expected to continue to receive waste for an additional 70 years (Clean Harbors, 2015). Therefore, the potential impacts of the use of additional filtration equipment on solid/hazardous waste generation are less than significant.

Selective Catalytic Reduction

Control measures in the 2017 Plan could require the installation of new SCR systems including Control Measure SS22 (Stationary Gas Turbines) which is expected to reduce NOx emissions on gas turbines by using SCRs. The catalyst in SCR beds generally uses various ceramic materials to carry oxide or precious metals to aid in the capture and convert NOx into N_2 and water in exhaust streams. SCRs require periodic regeneration or replacement of the catalyst bed. Regeneration of catalyst is preferred, due to the cost of new catalyst, however, if the catalyst cannot be regenerated, metals used in the catalyst can be recovered. These metals could then be recycled and the remaining material would most likely need to be disposed of at a landfill.

If the catalyst is not hazardous, jurisdiction for its disposal then shifts to local agencies such as regional water quality control boards or county environmental agencies. The RWQCB has indicated that if a spent catalyst is not considered a hazardous waste, it would probably be considered a Designated Waste. A Designated Waste is characterized as a non-hazardous waste consisting of, or containing pollutants that, under ambient environmental conditions, could be released at concentrations in excess of applicable water objectives, or which could cause degradation of the waters of the state. The type of landfill that the material is disposed at will depend upon its final waste designation. The use of SCRs is expected to be limited to gas turbines or other heavy industrial uses (e.g., ports) so that its use is not expected to be wide-spread. Due to the regeneration of catalysts used in SCRs and the fact that this technology is not expected to be widely used because of cost, no significant impacts on waste disposal are expected.

Carbon Adsorption

The proposed control measures may generate additional solid or hazardous waste in the form of carbon used to control organic emissions, should facilities choose to comply using activated carbon filters. Based on a review of control measures in the 2017 Plan, this control method is not expected to be used much to comply with the 2017 Plan. The amount of solid waste, which may be generated by the carbon adsorption process would depend on the number of carbon adsorbers installed, the operating characteristics, and the frequency of carbon replacement. Most of the control measures have alternative methods of compliance, e.g., use of low VOC materials, which is expected to be the more common method of compliance.

If carbon adsorption systems are used, the amount of hazardous waste generated on an annual basis is expected to be minimal. Most activated carbon used in carbon adsorption control devices is reclaimed and reactivated, resulting in negligible impacts on solid waste disposal facilities. Activated carbon can have a lifetime of five to 10 years;

however, the operating characteristics of the control device may result in a shorter lifetime.

Spent carbon is usually recycled and reused rather than disposed in landfills. Most facilities contract out with vendors that take the spent carbon and deliver regenerated carbon. Another alternative to the land disposal of regenerated carbon is to burn the spent carbon in a thermal incinerator. With thermal incineration, the organic materials contained in the carbon are oxidized to carbon dioxide, water, and in most cases, harmless combustion by-products. Incineration destroys the toxic constituents and significantly reduces the volume of carbon to be disposed of, thus reducing solid waste impacts. Based upon the above considerations, significant adverse solid waste impacts resulting from the use of carbon adsorption are not expected due to implementation of the control measures within the 2017 Plan.

Sodium Bicarbonate

SS8 – Coke Calcining was determined to result in an increase in the use of sodium bicarbonate and generate and estimate 2,380 tons per year of spent sodium bicarbonate. The material will continue to be taken to the U.S. Ecology Beatty Nevada hazardous waste facility for treatment and disposal. U.S. Ecology, Inc. is currently receiving waste and is in the process of extending the operational capacity for an additional 35 years. Clean Harbors in grassy Mountain, Utah is also available to receive hazardous waste and is expected to continue to receive waste for an additional 70 years.

3.8.5.1.2 Early Retirement of Equipment

TR23 – Lawn and Garden Equipment could require the retirement of fossil fuel equipment with electric equipment. Also, control measures in the 2017 Plan such as TR14 and TR19 would incentivize the early retirement of vehicles (cars, light trucks, medium duty trucks, and heavy duty trucks. Approximately 80 percent of a retired vehicle can be recycled and reused in another capacity. Batteries, catalytic converters, tires, and other recoverable materials (e.g., metal components) are removed and the rest of the vehicle is shredded. The shredded material is then sent for recovery of metal content. Therefore, the amount of solid waste landfilled as a result of the proposed measures would be smaller than the size of the vehicle. Additionally, there are a limited number of vehicles that can be scrapped per year. These vehicles would be scrapped in the near future, regardless of the control measures as they are older vehicles. Some equipment, such as trucks, can be sent to other locations for use, e.g., outside of California or to other countries. The same is true for lawn care equipment. New equipment would replace older equipment. If the equipment has reached the end of its useful life, it would be scrapped. However, if it has not reached the end of its life, it would be expected to be used in other locations. Therefore, the control measures would not necessarily result in an increase in the generation of waste, rather they would result in an earlier generation of the waste. Based on the above, the increase in solid waste is expected to be accounted for within the California Integrated Waste Management

Board's permitted capacity of the landfills within the Bay Area of about 50,000 tons per day so that no significant impacts would be expected.

The California Integrated Waste Management Act of 1989 (AB 939) requires cities and counties in California to reduce the amount of solid waste disposed in landfills by 25 percent by 1995 and by 50 percent by 2000, through source reduction, recycling and composting activities. Many cities and counties have not met these waste reduction goals. The generation of additional waste could impact the abilities of cities and counties to further reduce wastes. However, as discussed above the increase in solid waste that is expected to be diverted to a landfill is small and many of the waste streams are recyclable.

3.8.5.1.3 Spent Batteries from Electric Vehicles

Control measures that incentivize the use of electric vehicles are expected to reduce the use of conventional vehicles within California and the Bay Area. Conventional vehicles use lead acid batteries; therefore, a reduction in the use of conventional vehicles would lead to a reduction in use of lead-acid batteries. Lead-acid batteries have a three to five-year life, which is much less than the life of the vehicle so that the batteries need to be replaced every so often. Electric vehicles and hybrid batteries last a much longer time than lead-acid batteries. Most of the batteries in electric vehicles have warranties for 10 years or 150,000 miles. Toyota has reported that its battery packs have lasted for more than 180,000 miles in testing. A large number of Ford Escape Hybrid and Toyota Prius taxicabs in New York and San Francisco have logged over 200,000 miles on their original battery packs (Edmunds, 2014). Therefore, electric and hybrid batteries last much longer than lead-acid batteries so that an increase in the use of electric/hybrid vehicles would result in a decrease in the generation of spent lead-acid batteries that require recycling.

Batteries in hybrids are much larger than batteries in conventional vehicles. The current hybrid batteries weigh about 110 pounds and are composed of NiMH batteries which are charged by an internal combustion engine driven generator and/or by a regenerative braking system that captures power from deceleration and braking. The recycling of hybrid battery packs is still in its infancy as there have not been many battery packs surrendered for recycling. The NiMH batteries found in hybrid vehicles are basically "zero-landfill" products, meaning that whatever cannot be recycled is typically consumed in the recycling process. The primary metals recovered during recycling are nickel, copper and iron. Some principal rare earth metals, neodymium and lanthanum, are also recovered (Edmunds, 2014). Improper disposal of NiMH batteries poses less environmental hazard than that of lead-acid or nickel-cadmium batteries because of the absence of lead and cadmium, which are considered to be toxic. Most industrial nickel is recycled, due to the relatively easy retrieval of the magnetic element from scrap using electromagnets, and due to its high value.

NiMH and Li-ion batteries are generally recycled because the material within the batteries is valuable. Further some manufacturers offer incentives to prevent illegal disposal of the batteries. Most car manufacturers offer a program to take back used or damaged battery packs, including Toyota and Nissan (Green Car Reports, 2016). Recycling in isolation is not profitable, as lithium-ion batteries are composed of relatively inexpensive materials. However, recycling is attractive for several reasons, including supporting a closed-loop supply chain and supporting the principles of environmentalism and sustainability. A closed-loop supply chain would protect manufactures from volatility in the lithium market since approximately 70 percent of the global lithium deposits are concentrated in South America (MNTRC, 2014).

Two recycling firms have the technology to recycle NiMH and Li-ion batteries. One of these companies is the Belgium-based metals recycling company Umicore. Umicore is the European leader and is expanding in the U.S. The only company in North America with the capacity to recycle Li-ion batteries is Retriev Technologies (previously known as Toxco), which was awarded a federal grant to build and operate an advanced lithium battery recycling facility at their existing Lancaster, Ohio site (Edmunds, 2014).

The Retriev Technologies operation appears to be the recycler most widely used by companies that sell hybrids and EVs in North America when batteries reach their end of life. The facility uses a proprietary system and is mainly concerned with recycling nickel-metal hydride batteries, but currently handles small volumes of Li-ion packs as it works with automakers to develop the best recycling processes. Once the packs are at the proper distribution point, the recyclers break down their constituent parts to salvage any wiring, electrical components and plastics that can be separately recycled. A high temperature process is used to separate the battery content into metal alloys and slag that concentrates the rare earth elements that the batteries contain (Edmunds, 2014).

Most battery and fuel cell technologies currently employ materials that have high economic value and, therefore, are recyclable. Additionally, both regulatory requirements and market forces require or encourage recycling. A number of federal and state regulations and requirements have been imposed that require the recycling of batteries.

Recycling of lead-acid and nickel-cadmium batteries is a well-established activity. Eighty percent of lead consumed in the United States is used to produce lead-acid batteries and the lead recovery rate from batteries is approximately 80 to 90 percent (the remainder is plastic and fluids, e.g., sulfuric acid). According to the Lead-Acid Battery Consortium, 95 to 98 percent of all battery lead is recycled.

Because most EV batteries are recycled, it is unlikely that the increase in battery use would significantly adversely affect landfill capacity in California. As mentioned earlier, electric batteries generally hold significant residual value, and 95 to 98 percent of all lead-acid batteries are recycled. In addition, the electric batteries that would power EVs are packaged in battery packs and cannot be as easily disposed of as a single 12-volt conventional vehicle battery. It should be noted that the increased use of EVs may actually result in a reduction of the amount of solid and hazardous waste generated, as NiMH and Li-ion in batteries have a much longer life span than conventional lead-acid batteries. Further, their size (over 100 pounds) makes them more difficult to handle and transport for unauthorized disposal.

EVs do not require the various oil and gasoline filters that are required by vehicles using internal combustion engines. Furthermore, EVs do not require the same type or amount of engine fluids (oil, antifreeze, etc.) that are required by vehicles using internal combustion engines. Approximately 48,000 tons per year of waste oil was generated in the Bay Area in 2015 (see Table 3.8-3). Because of the widespread use and volume of waste oil, a portion of waste oil is illegally disposed of via sewers, waterways, on land, and disposed of in landfills. Waste oil that is illegally disposed can contaminate the environment (via water, land or air). In addition, a substantial amount of motor oil leaks onto the highways from vehicles each year. This motor oil is washed into storm drains and eventually ends up in the ocean.

Illegal or improper disposal of electric batteries could result in significant solid waste impacts by allowing hazardous wastes to be disposed in municipal landfill. However, the recycling of batteries is required under law. Further some manufacturers pay for used EV/hybrid batteries. The value, size, and length of life of NiMH and Li-ion batteries are such that recycling is expected to be more predominate than with lead acid batteries. Therefore, the use of EVs and hybrids are not expected to result in an increase in the illegal or improper disposal of electric batteries. Further, batteries associated with electric and hybrid cars are required to be recycled. Therefore, no significant increase in the disposal of hazardous or solid waste is expected due to increased use of electric or hybrid vehicles.

3.8.6 CUMULATIVE UTILITIES IMPACTS

In addition to evaluating whether any action the District may take in implementing the proposed 2017 Plan will cause significant air quality impacts by itself, the EIR must also evaluate whether any District action may contribute to significant cumulative air quality impacts caused by other existing and reasonably foreseeable future activities. Specifically, CEQA Guidelines Section 15064(h) requires an evaluation of whether the District’s implementation of the proposed 2017 Plan will result in any “cumulatively considerable” contribution to an existing (or reasonably foreseeable future) significant utilities and service systems impact. The geographical location for the cumulative analysis is the jurisdictional boundaries of the Air District, which includes all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties, and portions of southwestern Solano and southern Sonoma counties.

The Air District has considered the potential for the proposed 2017 Plan to contribute to cumulative utilities and service system impacts with respect to all potential existing and reasonably foreseeable future activities. In doing so, the District has considered the potential for other activities that could result from implementation of the *Plan Bay Area*, the Regional Transportation Plan and SB 375 Sustainable Communities Strategy adopted by MTC and ABAG. With respect to energy use, as MTC and ABAG found in their EIR for *Plan Bay Area*, implementation of *Plan Bay Area* would result in a lower per capita daily energy consumption relative to existing conditions, and would therefore result in a less than significant impact. Implementation of *Plan Bay Area* could result in potentially significant impacts due to the generation of solid waste, which may reduce the capacity of landfills faster than anticipated (ABAG, 2013).

The District has taken these potential *Plan Bay Area* energy use and solid waste impacts into account in its cumulative impact analysis. With respect to the impacts of the proposed 2017 Plan in relationship to impacts of past, present and reasonably foreseeable future projects, as described in Section 3.8.2, the Bay Area has sufficient electricity supplies and has sufficient solid and hazardous waste landfill facilities. The 2017 Plan is not expected to exceed the current capacity of the electric utilities in the Bay Area or create significant impacts on regional electricity supplies or on requirements for additional electricity. Further, the 2017 Plan is expected to result in minimal waste generation and is not expected to exceed the capacity of designated landfills. Therefore, utility and service system impacts associated with the 2017 Plan are not cumulatively significant and would not make a considerable contribution to a cumulatively significant utilities/service systems impact. The Air District concludes that the 2017 Plan will not result in any significant electricity or solid/hazardous waste impacts, individually or cumulatively, that must be addressed in this Program EIR.

For all of these reasons, there are no significant cumulative utilities and service system impacts associated with the proposed 2017 Plan.

3.8.7 CONCLUSIONS

Based on the above analysis, the 2017 Plan will not result in any significant utilities and service system impacts, individually or cumulatively, that must be addressed in this Program EIR. The increase in electricity associated with the 2017 Plan is expected to be much less than one percent of the existing electrical demand and is not expected to exceed the current capacity of the electric utilities in the Bay Area or create significant impacts on regional electricity supplies or on requirements for additional electricity. The 2017 Plan impacts on electricity supply are less than significant.

Based on the preceding analysis, due to the recycling value of the materials involved, the increased use of electric or hybrid vehicles and subsequent generation of batteries and other types of waste from air pollution control technology and devices were found to result in less than significant impacts. This is because the amount of solid and hazardous waste generated is minimal and not expected to exceed the capacity of designated landfills. The 2017 Plan impacts on solid/hazardous waste are less than significant.

CEQA requires mitigation measures to be implemented to avoid or minimize any significant impacts. As no significant utilities and service systems impacts have been identified, no mitigation measures to reduce or avoid utilities and service system impacts are proposed for the 2017 Plan.

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CHAPTER 4.0 ALTERNATIVES ANALYSIS

4.0 ALTERNATIVES ANALYSIS

4.1 INTRODUCTION

This EIR provides a discussion of alternatives to the proposed project as required by CEQA. According to the CEQA Guidelines, alternatives should include realistic measures to attain the basic objectives of the proposed project and provide means for evaluating the comparative merits of each alternative (Guidelines 15126.6(a)). In addition, though the range of alternatives must be sufficient to permit a reasoned choice, they need not include every conceivable project alternative. For example, an EIR need not consider an alternative whose effect cannot be reasonably ascertained and whose implementation is remote and speculative (Guidelines 15126.6(f)(3)).

The alternatives included in CEQA documents are typically developed by breaking down the project into distinct components and varying the specifics of one or more of the components. Different compliance approaches that generally achieve the objectives of the project may also be considered as project alternatives.

The discussion of alternatives is required to focus on alternatives to the proposed project or its location that are capable of avoiding or substantially lessening any significant effects of the proposed project on the environment (Guidelines 15126.6(b)). As discussed in Chapter 3 of this EIR, the proposed project would result in one significant unavoidable impact:

- New air pollution control equipment to implement the 2017 Plan, particularly Wet Gas Scrubbers, could require water use that would exceed the threshold for a significant impact for water demand. In particular, a single Wet Gas Scrubber requires approximately 432,000 gallons of water per day. However, water demand that exceeds 263,000 gallons of water per day is considered a significant environmental impact. The recommended mitigation measures would require use of recycled water wherever possible, but water demand impacts are nonetheless anticipated to be significant.

The intent of this alternatives analysis is to foster informed decision making and public participation by analyzing reasonable alternatives to the 2017 Clean Air Plan and disclosing whether there may be an alternative which would achieve the Plan's objectives while also avoiding or substantially lessening any significant effects.

To be conservative, this alternatives analysis limits the proposed project to those activities discussed in the introduction to Chapter 3 which would be new activities undertaken specifically by the Air District as a consequence of adopting the 2017 Plan.

4.2 PROJECT OBJECTIVES

CEQA Guidelines section 15124, subdivision (b), requires an EIR to include a statement of objectives, which describes the underlying purpose of the proposed project. The purpose of the statement of objectives is to aid the lead agency in identifying alternatives and the decision-makers in preparing a statement of findings and a statement of overriding considerations, if necessary. The objectives of the proposed 2017 Plan are summarized as follows:

- Comply with the 1988 California Clean Air Act requirements including:
    - Apply best available retrofit control technology (BARCT);
    - Implement all feasible measures through an expeditious implementation schedule
    - Reduce population exposure to ozone and its precursors according to a prescribed schedule;
    - Provide for the attainment of the State ozone ambient air quality standard at the earliest practicable date.
- Comply with transport mitigation requirements in Health and Safety Code §40912.
- Comply with state ambient air quality standards for $PM_{2.5}$.
- Reduce ambient concentrations of toxic air contaminants.
- Protect the climate, by reducing Bay Area GHG emissions in the near term and laying the ground work for deeper reductions in the future to ultimately achieve 40% below 1990 levels by 2030 and 80% below 1990 levels by 2050.

To be feasible, an alternative would need to meet all of these project objectives.

4.3 ALTERNATIVES REJECTED AS INFEASIBLE

CEQA Guidelines section 15126.6(c) provides that CEQA documents should identify any alternatives that were considered by the lead agency but rejected as infeasible, and should explain the reason underlying the lead agency's determination. The factors that may be used to eliminate alternatives include: 1) failure to meet the basic project objectives; 2) infeasibility; or 3) inability to avoid significant environmental impacts.

In developing the alternatives to be considered in this EIR, a key consideration was whether alternatives could be developed that would lessen or avoid the significant unavoidable water demand impact. Since WGSs are used to reduce sulfur dioxide and particulate matter and are considered Best Available Control Technology (BACT) for removal of sulfur dioxide, which is a criteria pollutant under both the federal and California Clean Air Acts, the Air District cannot eliminate the requirement that stationary sources meet the emission reductions associated with WGSs. If there was another technology that could meet the emission reduction potential of WGSs that technology would also be considered BACT and its use could be required to meet emission limitations imposed by the Air District rules and regulations. However, there is no other technology that achieves the emission reduction potential as a WGS and therefore sources that this technology can be used on are required to use this technology. As a result, it is not feasible to develop an alternative that does not include WGS, as their use is mandated by law.

4.4 ALTERNATIVES TO THE PROPOSED PROJECT

The alternatives to the proposed 2017 Plan are limited by the nature of the project. The 2017 Plan is a multi-pollutant air quality plan that also fulfills California Clean Air Act (CCAA) requirements for an ozone attainment plan. As a multi-pollutant plan, the 2017 Plan discusses and presents control measures to address criteria pollutants, including ozone, PM, toxic air contaminants, and greenhouse gases. This approach allows for full consideration of potential co-benefits, where a control measure can help to reduce emissions of more than one pollutant, as well as dis-benefits, where a control measure that reduces emissions of one pollutant could increase emissions of another. The result is a coordinated plan that considers the best overall approach to reduce emissions of all types of air pollutants.

Because the 2017 Plan is also intended to meet state requirements for an ozone attainment plan, it must include estimates of current and future emissions of the pollutants that form ozone, and a control strategy that includes "all feasible measures" to reduce these emissions. To identify all feasible measures, staff from the Air District reviewed and evaluated 366 potential control measures compiled from a variety of sources, using the process described in Appendix H to the Clean Air Plan. As a result of this process, the Air District has concluded that the 2017 Plan includes all feasible control measures.

The alternatives are constrained by the state requirement for an updated ozone attainment plan. With this in mind, this EIR analyzes three alternatives to the 2017 Plan. One is the no project alternative, which is required to be assessed under CEQA in order to provide decision-makers with a realistic view of what would occur if the project were not approved. The second alternative would be to simplify the plan, removing the multi-pollutant component and focusing on the state requirements for controlling ozone. The third alternative takes a slightly broader approach and addresses all criteria pollutants, including ozone.

4.4.1 ALTERNATIVE 1: NO PROJECT ALTERNATIVE

CEQA requires that that the No Project Alternative be evaluated. This alternative consists of what would occur if the proposed project were not approved. In that case, the 2010 Clean Air Plan would continue in force, and its control measures would continue to be implemented, including those measures which have been carried forward to the 2017 Plan. Efforts which are being undertaken primarily by other agencies would also continue, although the Air District could potentially have less involvement (see Table 4-1).

The main difference between the 2017 Plan and the No Project Alternative, therefore, is that a number of new programs and control measures may not be implemented under the No Project Alternative. These include regulatory actions, such as SS7, to limit SO_2 emissions from acid plants associated with petroleum refining; SS23 to require that all biogas and non-refinery flares meet a lowest available emissions reduction level; and SS31, to reduce or revise the Air District's allowable weight rate limitations for particulate matter. The proposed new grant or incentive programs may not be implemented, including TR20, to provide financial incentives for cleaner ocean-going vessels to call at the ports. A complete list of the six control measures that would still be implemented under Alternative 1 is shown in Table 4.1.

TABLE 4-1
Control Measures Implemented Under Alternative 1

Control Measure Number	Name
Stationary Source Measures	
SS1	Fluid Catalytic Cracking in Refineries
SS19	Portland Cement
SS30	Residential Fan Type Furnaces
Transportation Measures	
TR14	Cars and Light Trucks
TR19	Medium- and Heavy-Duty Trucks
TR23	Lawn and Garden Equipment

Alternative 1 would reduce or minimize the potentially significant adverse impacts associated with increased water demand. However, most of the Project Objectives outlined in Section 4.2 would not be completely achieved through continued implementation of the 2010 CAP, including compliance with the CCAA for ozone by not adopting “all feasible measures,” compliance with the ozone transport mitigation requirements, reducing particulate matter and toxic air contaminants to the greatest extent feasible, and reducing greenhouse gas emissions to protect the climate.

4.4.2 ALTERNATIVE 2: OZONE CONTROL ONLY

Under this alternative, only those portions of the 2017 Plan and its control measures that are required in order for the Air District to comply with the California Clean Air Act requirements for ozone would be implemented. The control measures that would be implemented under Alternative 2 are outlined in Table 4-2. Control measures addressing particulate matter, toxic air contaminants and greenhouse gases would not be implemented. These include numerous proposed new or revised Air District rules to reduce SO_2 emissions (SS5, SS6, SS7); particulate matter emissions (SS31, SS34-SS37); diesel particulate matter and black carbon emissions from backup generators (SS32); and greenhouse gas emissions (SS15).

However, the potentially significant impact of increased water demand would be eliminated under Alternative 2. Thus, anticipated ozone benefits achieved under Alternative 2 would be similar to the proposed project and the water demand would be reduced to less than significant. In addition, some of the project objectives outlined in Section 4.2 would be achieved including compliance with the California CAA by adopting all feasible measures for ozone and compliance with the ozone transport mitigation requirements. The other objectives of reducing ambient concentrations of particulate matter, toxic air contaminants and greenhouses gases would not be achieved.

TABLE 4-2
Control Measures Implemented Under Alternative 2

Control Measure Number	Name
Stationary Source Measures	
SS14	Methane from Capped Wells
SS22	Stationary Gas Turbines
SS23	Biogas Flares
SS28	LPG, Propane, Butane
SS29	Asphaltic Concrete
SS30	Residential Fan Type Furnaces
Transportation Measures	
TR14	Cars and Light Trucks
TR19	Medium- and Heavy-Duty Trucks
TR20	Ocean Going Vessels
TR23	Lawn and Garden Equipment
Waste Measures	
WA1	Landfills

4.4.3 ALTERNATIVE 3: CRITERIA POLLUTANT CONTROL ONLY

This alternative is wider in scope than the ozone control only approach presented as Alternative 2, in that it includes all criteria pollutants. Table 4-3 summarizes the control measures that would be included under Alternative 3. There would be no discussion or control measures addressing Greenhouse Gases and Climate Change and toxic air contaminants. Potential regulatory actions proposed in the 2017 Plan to reduce toxic air contaminants (SS32), and greenhouse gas emissions (SS15) would not be included in the Criteria Pollutant Only Alternative.

TABLE 4-3
Control Measures Implemented Under Alternative 3

Control Measure Number	Name
Stationary Source Measures	
SS1	Fluid Catalytic Cracking in Refineries
SS5	Sulfur Recovery Units
SS6	Refinery Fuel Gas
SS7	Sulfuric Acid Plants
SS14	Methane from Capped Wells
SS19	Portland Cement
SS22	Stationary Gas Turbines
SS23	Biogas Flares
SS28	LPG, Propane, Butane

TABLE 4-3
Control Measures Implemented Under Alternative 3

Control Measure Number	Name
SS29	Asphaltic Concrete
SS30	Residential Fan Type Furnaces
SS31	General PM Emission Limitation
SS34	Wood Smoke
SS35	PM from Bulk Materials, including Coke and Coal
SS36	PM from Trackout
SS37	PM from Asphalt Operations
Transportation Measures	
TR14	Cars and Light Trucks
TR19	Medium- and Heavy-Duty Trucks
TR20	Ocean Going Vessels
TR23	Lawn and Garden Equipment
Waste Measures	
WA1	Landfills

Alternative 3 would not be expected to reduce or minimize the potentially significant adverse impacts associated with increased water demand. However, some of the Project Objectives outlined in Section 4.2 would be achieved including compliance with the CCAA for ozone, compliance with the ozone transport mitigation requirements and reducing ambient concentrations of particulate matter. The other objectives of reducing toxic air contaminants and greenhouses gases would not be achieved.

4.5 ALTERNATIVES ANALYSIS

4.5.1 AIR QUALITY IMPACTS

4.5.1.1 Alternative 1 – No Project Alternative

Under the No Project Alternative, it is assumed that the 2017 Plan will not be implemented. As shown in Table 4-1, only the control measures already approved by the Air District or the TCMs already approved by MTC would still occur. The control measures currently proposed by the Air District as part of 2017 Plan would not be implemented including the stationary source measures, the transportation measures, energy demand measures, building measures, natural and working lands measures and short-lived climate pollutant measures.

The expected emission reductions under the No Project Alternative are summarized in Table 4-4. Emission reductions would still occur related to previously approved stationary measures and transportation control measures. Although emission reductions would still occur under the No Project Alternative, the emission reductions would be less than the proposed project (about 5,800 lbs/day of ROG less and about 2,500 lbs/day of NOx less than the proposed project), potentially resulting in higher ozone concentrations and greater ozone transport. The No Project Alternative would also provide less emission reductions associated with PM2.5, SO_2, and GHGs than the proposed project. The other potential air quality impacts related to implementation of the Plan would not be expected to occur (except for those control measures that have already been approved), i.e., (1) impacts from control of stationary sources; (2) impacts from increased electricity demand, (3) secondary emissions from use of lower ROG materials; (4) potential increase in localized emissions; and (5) impacts from construction activities. The above impacts from the 2017 Plan were expected to be less than significant in Chapter 3, and the emission reductions from the 2017 Plan would far outweigh any potential secondary emission increases associated with the 2017 Plan. As shown in Table 4-4, the emission reductions under Alternative 1 would be less than the proposed project.

TABLE 4-4
Air Emission Reductions Under Alternative 1 No Project

No.	Title	Estimated Emission Reductions[1,2] 2030 Criteria Air Pollutants (lbs/day)			
		ROG	NO_X	$PM_{2.5}$	SO_2
	Stationary Source Sector				
SS1	Fluid Catalytic Cracking in Refineries			1,222	
SS19	Portland Cement				4,493
SS30	Residential Fan Type Furnaces		13,200		
	Transportation Sector				
TR14	Cars & Light Trucks	64	64	14	
TR19	Medium and Heavy Duty Trucks	44	362	10	
TR23	Lawn Care Equipment	2,835	315	630	
Total Estimated Emissions Reductions Under Alternative 1		**2,943**	**13,941**	**1,876**	**4,493**
Total Emission Reductions Under the 2017 Plan		**8,743**	**16,399**	**2,775**	**14,193**

4.5.1.2 Alternative 2 – Ozone Control Only

Under Alternative 2, it is assumed that only the control measures that result in ROG and NOx emission reductions (and ultimately a decrease in ambient ozone concentrations) would be implemented, along with the already approved control measures (see Table 4-2). Control measures addressing particulate matter, toxic air contaminants and GHG emissions (only) would not be implemented under Alternative 2.

The expected emission reductions under the Alternative 2 are summarized in Table 4-5. The emission reductions of ROG and NOx would be the same as the proposed project. Emission reductions of $PM_{2.5}$ and SO_2 would be less than under the proposed 2017 Plan.

Alternative 2 would not result in a reduction in the secondary air quality impacts related to implementation of the 2017 Plan, including: (1) impacts from control equipment installed on stationary sources; (2) impacts from increased electricity demand, (3) potential increase in localized emissions; and (4) impacts from construction activities. The secondary impacts discussed above from the 2017 Plan were expected to be less than significant, as described in Chapter 3. Emission reductions from the 2017 Plan would far outweigh any potential secondary emission increases associated with the 2017 Plan or Alternative 2.
As shown in Table 4-5, the emission reductions under Alternative 2 would be identical to the 2017 Plan for ROG and NO_x, but would be about 2,000 lbs/day less than the 2017 Plan for $PM_{2.5}$ and about 14,000 lbs/day less than the 2017 Plan for SO_2.

TABLE 4-5
Air Emission Reductions Under Alternative 2 Ozone Control Only

No.	Title	Estimated Emission Reductions[1,2] 2030 Criteria Air Pollutants (lbs/yr)			
		ROG	NO_X	$PM_{2.5}$	SO_2
Stationary Source Sector					
SS14	Methane from Capped Wells				
SS22	Stationary Gas Turbines		1,500		
SS23	Biogas Flares		920		
SS28	LPG, Propane, Butane	5,000			
SS29	Asphaltic Concrete	400			
SS30	Residential Fan Type Furnaces		13,200		
Transportation Sector					
TR14	Cars & Light Trucks	64	64	14	
TR19	Medium and Heavy Duty Trucks	44	362	10	
TR20	Ocean Going Vessels		38		
TR23	Lawn Care Equipment	2,835	315	630	
Waste Sector					
WA1	Landfills	400			
Total Estimated Emissions Reductions Under Alternative 2		**8,743**	**16,399**	**654**	**0**
Total Emission Reductions Under the 2017 Plan		**8,743**	**16,399**	**2,775**	**14,193**

4.5.1.3 Alternative 3 – Criteria Pollutant Control Only

Under Alternative 3, it is assumed that only the control measures that result in emission reductions of criteria pollutants would be implemented, along with the already approved control measures. The only control measures that are not included in Alternative 3 are those which relate only to TACs and GHGs (see Table 4-3).

TABLE 4-6
Air Emission Reductions Under Alternative 3 Criteria Pollutant Control Only

No.	Title	Estimated Emission Reductions[1,2] 2030 Criteria Air Pollutants (lbs/yr)			
		ROG	NO_X	$PM_{2.5}$	SO_2
Stationary Source Sector					
SS1	Fluid Catalytic Cracking in Refineries			1,222	
SS5	Sulfur Recovery Units				900
SS6	Refinery Fuel Gas				6,000
SS7	Sulfuric Acid Plants				2,800
SS14	Methane from Capped Wells				
SS19	Portland Cement				4,493
SS22	Stationary Gas Turbines		1,500		
SS23	Biogas Flares		920		
SS28	LPG, Propane, Butane	5,000			
SS29	Asphaltic Concrete	400			
SS30	Residential Fan Type Furnaces		13,200		
SS31	General PM Emissions Limits			300	
SS34	Wood Smoke			60	
SS35	PM from Bulk Materials, including Coke and Coal			4	
SS36	PM from Track Out			360	
SS37	PM from Asphalt Operations			175	
Transportation Sector					
TR14	Cars & Light Trucks	64	64	14	
TR19	Medium and Heavy Duty Trucks	44	362	10	
TR20	Ocean Going Vessels		38		
TR23	Lawn Care Equipment	2,835	315	630	

No.	Title	Estimated Emission Reductions[1,2] 2030 Criteria Air Pollutants (lbs/yr)			
		ROG	NO_X	$PM_{2.5}$	SO_2
Waste Sector					
WA1	Landfills	400			
Total Estimated Emissions Reductions Under Alternative 3		**8,743**	**16,399**	**2,775**	**14,193**
Total Emission Reductions Under the 2017 Plan		**8,743**	**16,399**	**2,775**	**14,193**

The expected emission reductions under the Alternative 3 are summarized in Table 4-6 above. The emission reductions of ROG, NO_x, PM2.5, and SO_x would be the same as the proposed project. Alternative 3 would also provide less emission reductions associated with TACs and GHG than the proposed project as those control measure would not be implemented.

Therefore, the air quality impacts associated with Alternative 3 are estimated to be the same as the proposed project as most of the stationary source and other control measures included in the 2017 Plan would be expected to be implemented under Alternative 3 or have already been approved.

4.5.2 GREENHOUSE GAS EMISSIONS

4.5.2.1 Alternative 1 – No Project Alternative

Under the No Project Alternative, it is assumed that the 2017 Plan will not be implemented. As shown in Table 4-1, only the control measures already approved by the Air District or the TCMs already approved by MTC would still occur. The control measures currently proposed by the Air District as part of 2017 Plan would not be implemented including the stationary source measures, the transportation measures, energy demand measures, building measures, natural and working lands measures and short-lived climate pollutant measures. The estimated GHG emission reductions under Alternative 1 are summarized in Table 4-7. As shown in Table 4-7, the GHG emission reductions under the 2017 Plan would be much greater than under Alternative 1.

TABLE 4-7
GHG Emission Reductions Under Alternative 1 No Project

No.	Title	Estimated Emission Reductions1,2	
		2030 Greenhouse Gases ($MTCO_2e/yr$)[3]	
		100-yr time frame	20-yr time frame
Stationary Source Sector			
SS1	Fluid Catalytic Cracking in Refineries		
SS19	Portland Cement	85,055	85,055
SS30	Residential Fan Type Furnaces		
Transportation Sector			
TR14	Cars & Light Trucks	3,963	3,963
TR19	Medium and Heavy Duty Trucks	138,306	138,306
TR23	Lawn Care Equipment	21,854	21,854
Alternative 1 Total Estimated GHG Emissions Reductions		**249,178**	**249,178**
2017 Plan Total Estimated GHG Emission Reductions		**765,569**	**1,555,339**

The other potential secondary GHG impacts related to implementation of the Plan would be reduced or would not occur (except for those control measures that have already been approved), i.e., (1) impacts from control of stationary sources; (2) potential impacts associated with transportation activities; (3) impacts from increased electricity demand, and (4) impacts from construction activities. The above impacts on GHGs from the 2017 Plan were expected to be less than significant in Chapter 3, and the GHG emission reductions from the 2017 Plan would outweigh any potential secondary GHG emission increases associated with the 2017 Plan.

As shown in Table 4-7, the emission reductions under Alternative 1 would be less than the proposed project but would still be greater than any secondary GHG emissions. The total estimated GHG emission increases in the 2017 Plan were 101,903 MT/year (see Table 3.3-15) which is still much less than the estimated GHG emission reductions under Alternative 1. Therefore, Alternative 1 would provide a beneficial impact on GHG emissions and climate change.

4.5.2.2 Alternative 2 – Ozone Control Only

Under Alternative 2, it is assumed that only the control measures that result in ROG and NOx emission reductions (and ultimately a decrease in ambient ozone concentrations) would be implemented (see Table 4-2), along with the already approved control measures. Control measures addressing particulate matter, toxic air contaminants and GHG emissions (only) would not be implemented under Alternative 2. The expected emission reductions under the Alternative 2 are summarized in Table 4-8. As shown in Table 4-8, the GHG emission reductions under the 2017 Plan would be roughly twice the GHG emission reductions under Alternative 2.

TABLE 4-8
GHG Emission Reductions Under Alternative 2 Ozone Control Only

No.	Title	Estimated Emission Reductions1,2 2030 Greenhouse Gases ($MTCO_2e/yr$)[3] 100-yr time frame	20-yr time frame
Stationary Source Sector			
SS14	Methane from Capped Wells	19	47
SS22	Stationary Gas Turbines		
SS23	Biogas Flares		
SS28	LPG, Propane, Butane		
SS29	Asphaltic Concrete		
SS30	Residential Fan Type Furnaces		
Transportation Sector			
TR14	Cars & Light Trucks	3,963	3,963
TR19	Medium and Heavy Duty Trucks	138,306	138,306
TR20	Ocean Going Vessels		
TR23	Lawn Care Equipment	21,854	21,854
Waste Sector			
WA1	Landfills	233,308	590,132
Alternative 2 Total Estimated GHG Emissions Reductions		**397,450**	**754,302**
2017 Plan Total Estimated GHG Emission Reductions		**765,569**	**1,555,339**

The other potential GHG impacts related to implementation of the Plan would be reduced or would not occur (except for those control measures that have already been approved), i.e., (1) impacts from control of stationary sources; (2) potential impacts associated with transportation activities; (3) impacts from increased electricity demand, and (4) impacts from construction activities. The above impacts on GHG from the 2017 Plan were expected to be less than significant in Chapter 3, and the GHG emission reductions from the 2017 Plan would outweigh any potential secondary GHG emission increases associated with the 2017 Plan.

As shown in Table 4-8, the emission reductions under Alternative 2 would be less than the proposed project but would still be greater than any secondary GHG emissions. The total estimated GHG emission increases in the 2017 Plan were 101,903 MT/year (see Table 3.3-15) which is still much less than the estimated GHG emission reductions under Alternative 2. Therefore, Alternative 2 would provide a beneficial impact on GHG emissions and climate change.

4.5.2.3 Alternative 3 – Criteria Pollutant Control Only

Under Alternative 3, it is assumed that only the control measures that result in emission reductions of criteria pollutants would be implemented, along with the already approved control measures. The only programs that are not included in Alternative 3 are those which relate to TACs and GHG emission which would not be implemented under Alternative 3 (see Table 4-3). The expected GHG emission reductions under the Alternative 3 are summarized in Table 4-9. As shown in Table 4-9, the GHG emission reductions under the 2017 Plan would be greater than the GHG emission reductions under Alternative 3.

The other potential secondary GHG impacts related to implementation of the Plan would be reduced or would not occur (except for those control measures that have already been approved), i.e., (1) impacts from control of stationary sources; (2) potential impacts associated with transportation activities; (3) impacts from increased electricity demand, and (4) impacts from construction activities. The above impacts on GHG from the 2017 Plan were expected to be less than significant in Chapter 3, and the GHG emission reductions from the 2017 Plan would outweigh any potential secondary GHG emission increases associated with the 2017 Plan. As shown in Table 4-9, the emission reductions under Alternative 3 would be less than the proposed project (roughly 60 percent of the proposed project for a 100-year time frame) but would still be greater than any secondary GHG emissions. The total estimated GHG emission increases in the 2017 Plan were 101,903 MT/year (see Table 3.3-15), which is still much less than the estimated GHG emission reductions under Alternative 3. Therefore, Alternative 3 would provide a beneficial impact on GHG emissions and climate change.

TABLE 4-9
GHG Emission Reductions Under Alternative 3 Criteria Pollutant Control Only

No.	Title	Estimated Emission Reductions	
		2030 Greenhouse Gases ($MTCO_2e/yr$)[3]	
		100-yr time frame	20-yr time frame
	Stationary Source Sector		
SS1	Fluid Catalytic Cracking in Refineries		
SS5	Sulfur Recovery Units		
SS6	Refinery Fuel Gas		
SS7	Sulfuric Acid Plants		
SS14	Methane from Capped Wells	19	47
SS19	Portland Cement	85,055	85,055
SS22	Stationary Gas Turbines		
SS23	Biogas Flares		
SS28	LPG, Propane, Butane		
SS29	Asphaltic Concrete		
SS30	Residential Fan Type Furnaces		

No.	Title	Estimated Emission Reductions	
		2030 Greenhouse Gases ($MTCO_2e/yr$)[3]	
		100-yr time frame	20-yr time frame
SS31	General PM Emissions Limits		
SS34	Wood Smoke		
SS35	PM from Bulk Materials, including Coke and Coal		
SS36	PM from Track Out		
SS37	PM from Asphalt Operations		
Transportation Sector			
TR14	Cars & Light Trucks	3,963	3,963
TR19	Medium and Heavy Duty Trucks	138,306	138,306
TR20	Ocean Going Vessels		
TR23	Lawn Care Equipment	21,854	21,854
Waste Sector			
WA1	Landfills	233,308	590,132
Alternative 3 Total Estimated GHG Emissions Reductions		**482,505**	**839,357**
2017 Plan Total Estimated GHG Emission Reductions		**765,569**	**1,555,339**

4.5.3 HAZARDS AND HAZARDOUS MATERIALS

4.5.3.1 Alternative 1 – No Project Alternative

Under the No Project Alternative, it is assumed that the 2017 Plan will not be implemented. As shown in Table 4-1, only the control measures already approved by the Air District or the TCMs already approved by MTC would still occur. The control measures currently proposed by the Air District as part of 2017 Plan would not be implemented including the stationary source measures, the transportation measures, energy demand measures, building measures, natural and working lands measures and short-lived climate pollutant measures.

The No Project Alternative would eliminate or reduce some of the hazard impacts associated with the 2017 Plan including: the hazards associated with an accidental release from new air pollution control devices; the hazards associated with reformulation of products; and the hazards associated with alternative fuels. The potential hazard impacts associated with implementation of the 2017 Plan were determined to be less than significant. The hazard impacts associated with the No Project Alternative would remain less than significant.

4.5.3.2 Alternative 2 – Ozone Control Only

Under Alternative 2, it is assumed that only the control measures that result in ROG and NO_x emission reductions (and ultimately a decrease in ambient ozone concentrations) would be implemented, along with the already approved control measures (see Table 4-2). Control measures addressing particulate matter, toxic air contaminants and GHG emissions (only) would not be implemented under Alternative 2. These means that a number of control measures that would require air pollution control equipment would not be implemented, e.g., wet gas scrubbers. SCRs are expected to still be required under Alternative 2 for gas turbines (SS22).

Alternative 2 would eliminate or reduce some of the hazard impacts associated with the 2017 Plan. However, the remaining control measures would still generate: (1) the hazards associated with an accidental release from new air pollution control devices, which would be expected to be similar as SCRs would still be implemented under SS22 Stationary Gas Turbines; and (2) the hazards associated with alternative fuels could still be encouraged and implemented. Hazards associated with reformulated products would be eliminated. The potential hazard impacts associated with the implementation of the 2017 Plan were determined to be less than significant. The hazard impacts associated with the Alternative 2 are expected to be less than the proposed project and would remain less than significant.

4.5.3.3 Alternative 3 – Criteria Pollutant Control Only

Under Alternative 3, it is assumed that only the control measures that result in emission reductions of criteria pollutants would be implemented, along with the already approved control measures. The only programs that are not included in Alternative 3 are those which relate to TACs and GHG emissions which would not be implemented under Alternative 3 (see Table 4-3). The expected GHG emission reductions under the Alternative 3 are summarized in Table 4-9. As shown in Table 4-9, the GHG emission reductions under the 2017 Plan would be greater than the GHG emission reductions under Alternative 3.

Alternative 3 would eliminate some control measures but most of the ones that were evaluated for hazard impacts would still be implemented so that hazard impacts associated with Alternative 3 are expected to be essentially the same as the proposed project. The control measures would still generate (1) the hazards associated with an accidental release from new air pollution control devices (e.g., SCRs under SS22 Stationary Gas Turbines); (2) hazards associated with reformulated products; and (3) the hazards associated with alternative fuels could still be encouraged and implemented. The potential hazard impacts associated with implementation of the 2017 Plan were determined to be less than significant. The hazard impacts associated with the Alternative 3 are expected to be the same as the proposed project and would remain less than significant.

4.5.4 HYDROLOGY AND WATER QUALITY

4.5.4.1 Alternative 1 – No Project Alternative

Under the No Project Alternative, it is assumed that the 2017 Plan will not be implemented. As shown in Table 4-1, only the control measures already approved by the Air District or the TCMs already approved by MTC would still occur. The control measures currently proposed by the Air District as part of 2017 Plan would not be implemented including the stationary source measures, the transportation measures, energy demand measures, building measures, natural and working lands measures and short-lived climate pollutant measures.

The No Project Alternative would eliminate or reduce some of the hydrology and water quality impacts associated with the 2017 Plan including impacts associated with: (1) water demand associated with the installation of new air pollution control equipment; (2) wastewater and water quality impacts associated with the installation of new air pollution control equipment; and (3) alternative fuels. It was determined that the 2017 Plan would result in potentially significant impacts on water demand due to the water use associated with wet gas scrubbers for control measures that require particulate control, e.g., SS1 – Fluid Catalytic Cracking in Refineries and SS7 Sulfuric Acid Plants. The No Project Alternative would eliminate SS7 but not SS1, as it was approved in the 2010 CAP. Therefore, water demand impacts would be reduced but would remain significant as at least three WGS would still be installed under Alternative 1. The remainder of the hydrology and water quality impacts would be reduced from the proposed project as well, and would remain less than significant.

4.5.4.2 Alternative 2 – Ozone Control Only

Under Alternative 2, it is assumed that only the control measures that result in ROG and NOx emission reductions (and ultimately a decrease in ambient ozone concentrations) would be implemented, along with the already approved control measures (see Table 4-2). Control measures addressing particulate matter, toxic air contaminants and GHG emissions (only) would not be implemented under Alternative 2. This means that a number of control measures that would require air pollution control equipment would not be implemented, e.g., wet gas scrubbers for PM control. SCRs are expected to still be required under Alternative 2 for gas turbines (SS22).

Alternative 2 would eliminate two stationary source control measures with potentially significant water demand impacts, SS1 – Fluid Catalytic Cracking in Refineries and SS7 – Sulfuric Acid Plants. These stationary source control measures would result in potentially significant impacts on water demand to the water use associated with wet gas scrubbers for control measures that require particulate control. Alternative 2 would eliminate SS1 and SS7 and would reduce the potentially significant impacts of water demand associated with the proposed project. The hydrology impacts associated with: (1) wastewater and water quality impacts associated with the installation of new air pollution control equipment; (2) alternative fuels; and (3) reformulated products would remain less than significant. The remainder of the hydrology and water quality impacts would be reduced from the proposed project as well, and would remain less than significant.

4.5.4.3 Alternative 3 – Criteria Pollutant Control Only

Under Alternative 3, it is assumed that only the control measures that result in emission reductions of criteria pollutants would be implemented, along with the already approved control measures. The only programs that are not included in Alternative 3 are those which relate to TACs and GHG emissions which would not be implemented under Alternative 3 (see Table 4-3).

Alternative 3 would reduce some of the hydrology and water quality impacts associated with the 2017 Plan including impacts associated with: (1) water demand associated with the installation of new air pollution control equipment; (2) wastewater and water quality impacts associated with the installation of new air pollution control equipment; (3) alternative fuels; and (4) reformulated products. It was determined that the 2017 Plan would result in potentially significant impacts on water demand due to the water use associated with wet gas scrubbers for control measures that require particulate control, e.g., SS1 – Fluid Catalytic Cracking in Refineries and SS7 Sulfuric Acid Plants. Under this alternative, both of these control measures would still be implemented. Therefore, water demand impacts would be the same as the proposed project and would remain significant as six to eight WGS would still be installed under Alternative 3. The remainder of the hydrology and water quality impacts would be reduced from the proposed project as well, and would remain less than significant.

4.5.5 NOISE

4.5.5.1 Alternative 1 – No Project Alternative

Under the No Project Alternative, it is assumed that the 2017 Plan will not be implemented. As shown in Table 4-1, only the control measures already approved by the Air District or the TCMs already approved by MTC would still occur. The control measures currently proposed by the Air District as part of 2017 Plan would not be implemented including the stationary source measures, the transportation measures, energy demand measures, building measures, natural and working lands measures and short-lived climate pollutant measures.

Some of the stationary source control measures in the No Project Alternative would still be implemented resulting in construction activities and new air pollution control equipment. This equipment would principally occur in industrial facilities such as refineries, power plants, and other similar facilities located in areas that are zoned for industrial uses and do not have sensitive receptors nearby. As a result, noise impacts are anticipated to be less than significant for Alternative 1.

4.5.5.2 Alternative 2 – Ozone Control Only

Under Alternative 2, it is assumed that only the control measures that result in ROG and NOx emission reductions (and ultimately a decrease in ambient ozone concentrations) would be implemented, along with the already approved control measures (see Table 4-2). Control measures addressing particulate matter, toxic air contaminants and GHG emissions (only) would not be implemented under Alternative 2. This means that a number of control measures that would require air pollution control equipment would not be implemented, e.g., wet gas scrubbers for PM control. SCRs are expected to still be required under Alternative 2 for gas turbines (SS22).

Alternative 2 would eliminate or reduce some of the noise impacts associated with the 2017 Plan by eliminating or reducing implementation of control measures that result in construction activities and new air pollution control equipment. However, most of the control measures that require construction would be included under Alternative 2. Therefore the construction of new equipment would be similar to the proposed project and it would principally occur in industrial facilities such as refineries, power plants and other similar facilities located in areas that are zoned for industrial uses and do not have sensitive receptors nearby. As a result, noise impacts are anticipated to be less than significant for Alternative 2.

4.5.5.3 Alternative 3 – Criteria Pollutant Control Only

Under Alternative 3, it is assumed that only the control measures that result in emission reductions of criteria pollutants would be implemented, along with the already approved control measures. The only programs that are not included in Alternative 3 are those which relate to TACs and GHG emissions which would not be implemented under Alternative 3 (see Table 4-3).

Alternative 3 would eliminate some of the control measures or reduce some of the noise impacts associated with the 2017 Plan by eliminating or reducing implementation of control measures that result in construction activities and new air pollution control equipment. While the construction of new equipment would be reduced, it would principally occur in industrial facilities such as power plants and other similar facilities located in areas that are zoned for industrial uses and do not have sensitive receptors nearby. As a result, noise impacts are anticipated to be less than significant for Alternative 3.

4.5.6 TRANSPORTATION AND TRAFFIC

4.5.6.1 Alternative 1 – No Project Alternative

Under the No Project Alternative, it is assumed that the 2017 Plan will not be implemented. As shown in Table 4-1, only the control measures already approved by the Air District or the TCMs already approved by MTC would still occur. The control measures currently proposed by the Air District as part of 2017 Plan would not be implemented including the stationary source measures, the transportation measures, energy demand measures, building measures, natural and working lands measures and short-lived climate pollutant measures.

Some of the stationary source control measures in the No Project Alternative would still be implemented resulting in the construction and operation of new air pollution control equipment, although the traffic impacts are expected to be reduced from the proposed project. The installation of additional pollution control equipment, primarily at industrial facilities is not expected to require additional employees to operate or generate substantial traffic during operations. As a result, traffic impacts under Alternative 1 would be less than the proposed project and are anticipated to be less than significant for Alternative 1.

4.5.6.2 Alternative 2 – Ozone Control Only

Under Alternative 2, it is assumed that only the control measures that result in ROG and NOx emission reductions (and ultimately a decrease in ambient ozone concentrations) would be implemented, along with the already approved control measures (see Table 4-2). Control measures addressing particulate matter, toxic air contaminants and GHG emissions (only) would not be implemented under Alternative 2. This means that a number of control measures that would require air pollution control equipment would not be implemented, e.g., wet gas scrubbers for PM control. SCRs are expected to still be required under Alternative 2 for gas turbines (SS22).

Some of the stationary source control measures in Alternative 2 would still be implemented resulting in the construction and operation of new air pollution control equipment, although the traffic impacts are expected to be reduced from the proposed project. The installation of additional pollution control equipment, primarily at industrial facilities is not expected to require additional employees to operate or generate substantial traffic during operations. As a result, traffic impacts under Alternative 2 would be less than the proposed project and are anticipated to be less than significant for Alternative 2.

4.5.6.3 Alternative 3 – Criteria Pollutant Control Only

Under Alternative 3, it is assumed that only the control measures that result in emission reductions of criteria pollutants would be implemented, along with the already approved control measures. The only programs that are not included in Alternative 3 are those which relate to TACs and GHG emissions which would not be implemented under Alternative 3 (see Table 4-3).

Some of the stationary source control measures in Alternative 3 would still be implemented resulting in the construction and operation of new air pollution control equipment, although the traffic impacts are expected to be reduced from the proposed project. The installation of additional air pollution control equipment, primarily at industrial facilities is not expected to require additional employees to operate or generate substantial traffic during operations. As a result, traffic impacts under Alternative 3 would be less than the proposed project and are anticipated to be less than significant for Alternative 3.

4.5.7 UTILITIES AND SERVICE SYSTEMS

4.5.7.1 Alternative 1 – No Project Alternative

Under the No Project Alternative, it is assumed that the 2017 Plan will not be implemented. As shown in Table 4-1, only the control measures already approved by the Air District or the TCMs already approved by MTC would still occur. The control measures currently proposed by the Air District as part of 2017 Plan would not be implemented including the stationary source measures, the transportation measures, energy demand measures, building measures, natural and working lands measures and short-lived climate pollutant measures.

Some of the stationary source control measures in the No Project Alternative would still be implemented resulting in the operation of new air pollution control equipment, although the electricity impacts are expected to be reduced from the proposed project. The installation of additional pollution control equipment under Alternative 1 would include wet gas scrubbers (SS1), caustic soda manufacture (SS19), and additional electrical lawn care equipment (TR23).

However, Alternative 1 would not include SCRs, or shore power for ocean-going vessels (TR20), reducing the amount of electricity that would be required to implement the 2017 Plan. In addition, electrification of some mobile sources would still be expected to occur. As a result, electricity impacts under Alternative 1 would be less than the proposed project and are anticipated to be less than significant.

The same would be true for solid/hazardous waste impacts. Due to the recycling value of the materials involved, the potential increase in solid/hazardous waste associated with the 2017 Plan was determined to be less than significant as some of the materials involved would be recycled (vehicles, old equipment, and catalyst). Less waste would be generated under Alternative 1, therefore, solid/hazardous wastes would remain less than significant.

4.5.7.2 Alternative 2 – Ozone Control Only

Under Alternative 2, it is assumed that only the control measures that result in ROG and NOx emission reductions (and ultimately a decrease in ambient ozone concentrations) would be implemented, along with the already approved control measures (see Table 4-2). Control measures addressing particulate matter, toxic air contaminants and GHG emissions (only) would not be implemented under Alternative 2. This means that a number of control measures that would require air pollution control equipment would not be implemented, e.g., wet gas scrubbers for PM control. SCRs are expected to still be required under Alternative 2 for gas turbines (SS22).

Some of the stationary source control measures in Alternative 2 would still be implemented resulting in the operation of new air pollution control equipment, although the solid/hazardous and electricity impacts are expected to be reduced from the proposed project. The installation of additional pollution control equipment under Alternative 2 would not include wet gas scrubbers (SS1), or caustic soda manufacture (SS19). However, Alternative 2 would include SCRs (SS22), additional electrical lawn care equipment (TR23), and shore power for ocean-going vessels. Therefore the amount of electricity used under Alternative 2 is expected to be less than would be required to implement the 2017 Plan. As a result, electricity impacts under Alternative 2 would be less than the proposed project and are anticipated to be less than significant.

The same would be true for solid/hazardous waste impacts. Due to the recycling value of the materials involved, the potential increase in solid/hazardous waste associated with the 2017 Plan was determined to be less than significant as some of the materials involved would be recycled (vehicles, old equipment, and catalyst). Less waste would be generated under Alternative 2, therefore, solid/hazardous wastes would remain less than significant.

4.5.7.3 Alternative 3 – Criteria Pollutant Control Only

Under Alternative 3, it is assumed that only the control measures that result in emission reductions of criteria pollutants would be implemented, along with the already approved control measures. The only programs that are not included in Alternative 3 are those which relate to TACs and GHG emissions which would not be implemented under Alternative 3 (see Table 4-3).

Some of the stationary source control measures in Alternative 3 would still be implemented resulting in the operation of new air pollution control equipment, although the electricity waste impacts are expected to be reduced from the proposed project. The installation of additional pollution control equipment under Alternative 3 would include wet gas scrubbers (SS1), caustic soda manufacture (SS19), SCRs (SS22), additional electrical lawn care equipment (TR23), and shore power for ocean-going vessels. Therefore the amount of electricity used under Alternative 3 is expected to be similar to the 2017 Plan. In addition, electrification of some mobile sources would still be expected to occur. As a result, electricity impacts under Alternative 3 are expected to be equivalent to the proposed project and are anticipated to be less than significant.

The same would be true for solid/hazardous waste impacts. Due to the recycling value of the materials involved, the potential increase in solid/hazardous waste associated with the 2017 Plan was determined to be less than significant as some of the materials involved would be recycled (vehicles, old equipment, and catalyst). A similar amount of waste would be generated under Alternative 3 as compared to the proposed project, therefore, solid/hazardous wastes would remain less than significant.

4.6 ENVIRONMENTALLY SUPERIOR ALTERNATIVE

Pursuant to CEQA Guidelines §15126.6(e)(2), if the environmentally superior alternative is the "no project" alternative, the EIR shall also identify an environmentally superior alternative among the other alternatives. The no project alternative is not the environmentally superior alternative as it would still result in significant water demand impacts.

The environmentally superior alternative is considered to be Alternative 2, Ozone Control Strategy Only. Under Alternative 2, the ROG and NO_x emission reductions would be the same as the proposed project and the potentially significant impact of increased water demand would be eliminated under Alternative 2. However, the emission reductions associated with $PM_{2.5}$, SO_2, and GHGs associated with Alternative 2 would be much less than the proposed project. Therefore, Alternative 2 is not expected to be environmentally superior to the proposed project because the particulate matter, SO_2 and GHG emission reductions would be greater under the proposed project (see Tables 4-5 and 4-8).

4.7 COMPARISON OF ALTERNATIVES

Pursuant to CEQA Guidelines §15126.6(d), an EIR should include sufficient information about each alternative to allow meaningful comparison with the proposed project. Section 15126.6(d) also recommends the use of a matrix to summarize the comparison. Table 4-10 below provides this matrix comparison.

The CEQA document shall include sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the proposed project (CEQA Guidelines §15126.6(d)). A matrix displaying the major characteristics and significant environmental effects of each alternative may be used to summarize the comparison. Table 4-10 lists the alternatives considered in this EIR and how they compare to proposed 2017 Plan. Table 4-10 presents a matrix that lists the significant adverse impacts associated with the proposed project and the project alternatives for all environmental topics analyzed. The table also ranks each section as to whether the proposed project or a project alternative would result in greater or lesser impacts relative to one another.

Alternative 1 – No Project Alternative is not expected to achieve any of the objectives of the proposed project and is not considered to be a viable alternative as it could result in violation of the CCA. Of the project Alternatives, Alternative 2 would generate the least severe and fewest environmental impacts compared to the 2017 Plan. However, Alternative 2 would provide less emission reductions for SO_2, $PM_{2.5}$ and GHGs than the 2017 Plan. Compared to the other project alternatives, Alternative 2 would not achieve some of the critical project objectives such as demonstrating attainment with the $PM_{2.5}$ standards. Other project objectives that would not be achieved under Alternative 2 including reducing ambient concentrations of TACs and reducing the Bay Area GHG emissions. Other objectives not fulfilled by Alternative 2 include applying BARCT and implementing all feasible measures through an expeditious implementation schedule.

Alternative 3 would be expected to generate equivalent impacts to the proposed project in all environmental topic areas analyzed and would provide fewer emission reductions than the 2017 Plan. Further, Alternative 3 would not achieve the project objectives of reducing TAC or GHG emissions as much as the 2017 Plan and, therefore, would not be considered the preferred alternative.

As discussed above, the proposed project has been proven to be the most effective project that achieves all of the project objectives relative to environmental impacts generated. Mitigation measures have been developed to minimize the potential increase in water demand, while achieving an overall air quality benefit for both criteria and TAC emissions providing the greatest public health benefit. In addition, the plan would reduce GHG emissions to the greatest extent, thus reducing the potential impacts of the Bay Area on climate change. The proposed project will satisfy the CAA for all applicable pollutants, which the other alternatives would not. Therefore, the proposed project is the preferred alternative.

TABLE 4-10
Comparison of Alternatives

ENVIRONMENTAL TOPIC	Proposed Project	No Project Alternative	Alternative 2	Alternative 3
Air Quality				
Air Quality Benefits	B	B(-)	B(-)	B(=)
Air Quality Impacts	NS	NS(-)	NS(-)	NS(=)
Toxic Air Contaminants	B	B(-)	B(-)	B(-)
GHG				
GHG Reductions/Impacts	B	B(-)	B(-)	B(-)
Hazards				
Hazard Impacts	NS	NS(-)	NS(-)	NS(=)
Hydrology/Water Quality				
Water Demand Impacts	S	S(-)	NS(-)	S(=)
Water Quality Impacts	NS	NS(-)	NS(-)	NS(=)
Noise				
Noise Impacts	NS	NS(-)	NS(-)	NS(=)
Transportation and Traffic				
Transportation and Traffic Impacts	NS	NS(-)	NS(-)	NS(-)
Utilities/Service Systems				
Electricity Demand Impacts	NS	NS(-)	NS(-)	NS(=)
Solid/Hazardous Waste Impacts	NS	NS(-)	NS(-)	NS(=)

Notes:
S = Significant
NS = Not Significant
MNS = Mitigated Not Significant
B = Beneficial
B(-) = Beneficial impacts of the alternative would be less than the proposed project.
(-) = Potential impacts are less than the proposed project.
(+) = Potential impacts are greater than the proposed project.
(=) = Potential impacts are approximately the same as the proposed project.

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CHAPTER 5.0 OTHER CEQA TOPICS

Relationship between Short-Term Benefits and
Long-Term Goals & Productivity
Significant Environmental Effects Which
Cannot Be Avoided
Significant Irreversible Environmental Changes
Growth-Inducing Impacts
Energy Conservation

5.0 OTHER CEQA TOPICS

5.1 RELATIONSHIP BETWEEN SHORT-TERM BENEFITS AND LONG-TERM GOALS AND PRODUCTIVITY

An important consideration when analyzing the effects of a proposed project is whether it will result in short-term environmental benefits to the detriment of achieving long-term goals or maximizing productivity of resources. Implementing the 2017 Plan is not expected to achieve short-term goals at the expense of long-term environmental productivity or goal achievement. The proposed 2017 Plan is a multi-pollutant air quality plan which updates the strategy for attainment of the California ozone standard in the Bay Area and provides an integrated approach to addressing other criteria pollutants under the California Clean Air Act as well as toxic air contaminants and greenhouse gases. As a result, the 2017 Plan is expected to enhance short and long-term environmental productivity in the region.

Implementing the 2017 Plan does not narrow the range of beneficial uses of the environment. Although one significant impact has been identified, implementation of the recommended mitigation measures will ensure that impact is mitigated to the greatest degree feasible. In addition, this impact could potentially be reduced in the long term, as a new type of device could be deemed the Best Available Control Technology (BACT) to address the same pollutants as the WGSs but with less water use. As a result, this impact does not indicate that the project would provide short-term benefits at the expense of long-term goals or environmental productivity.

5.2 SIGNIFICANT ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED

Section 15126.2 (b) of the CEQA Guidelines requires that an EIR describe significant environmental impacts that cannot be avoided, including those effects that can be mitigated but not reduced to a less than significant level. This DEIR found one significant impact associated with the 2017 Plan: Water demand associated with the use of add-on air pollution control technologies such as wet ESPs and WGSs is potentially significant.

Mitigation measures have been developed to require water recycling for these air pollution control devices are installed whenever feasible. However, because the demand for water could still be significant if some facilities are not able to utilize recycled water, the impact remains significant and unavoidable. Also, because certain air pollution control devices are considered the Best Available Control Technology (BACT) and are therefore required, as was explained in Chapter 4, the water demand of those devices cannot be avoided.

Despite this impact, numerous positive environmental changes are expected to result from implementation of the 2017 Plan. The project will result in significantly reduced emissions of air pollutants, thereby improving air quality and related public health. Emission reductions will also directly improve the vitality of crops and other plants. The health of livestock, domestic animals and other wildlife will be indirectly enhanced by the positive effects on plant life, as well as by any direct benefits attributable to less air pollution. The damage to buildings and other structures attributable to air pollution also will be diminished, as well as an improvement in aesthetics and visibility. Finally, the 2017 Plan would result in a decrease in GHG emissions which will help the Bay Area to achieve the interim SB 32 GHG reduction goal and the long-term goal of climate stabilization.

5.3 SIGNIFICANT IRREVERSIBLE ENVIRONMENTAL CHANGES

CEQA requires an EIR to discuss significant irreversible environmental changes which would result from a proposed action should it be implemented (CEQA Guidelines §15126.2 (c)). Irreversible changes include a large commitment of nonrenewable resources, such as committing future generations to specific uses of the environment by converting undeveloped land to urban uses, or enduring environmental damage due to an environmental accident.

One significant unavoidable impact was identified for the 2017 Plan, due to the amount of water needed to operate certain types of air pollution control devices which could be needed to implement the Plan. Feasible mitigation measures have been developed to require water recycling wherever feasible, although those mitigation measures may not reduce the impacts to less than significant.

While the amount of water needed may be significant, this water demand represents only an incremental increase relative to the rate of use of these resources due to population growth and increased consumer demand. In addition, water use for air pollution control could decrease in the future if newer technologies are developed, if processes change, or if demand decreases for products whose manufacture requires these air pollution control devices. Through its measures to reduce greenhouse gas emissions, the 2017 Plan also proposed multiple programs and actions to reduce use of nonrenewable resources, including water.

The 2017 Plan includes measures consistent with the overall land use vision for the region set forth in Plan Bay Area. Land use changes could result from this plan but would likely be minimal due to Plan Bay Area's emphasis on concentrating development within Planned Development Areas while protecting Priority Conservation Areas. These land use changes were assessed in the adopted EIR for Plan Bay Area, and the plan was approved in 2013. At the same time, the largely irretrievable conversion of undeveloped/agricultural land to urban uses is a function of the growing population and local land use authority, not the 2017 Plan, and would occur regardless of adoption of the 2017 Plan.

5.4 GROWTH-INDUCING IMPACTS

CEQA defines growth-inducing impacts as those impacts of a proposed project that "could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Included in this are projects which would remove obstacles to population growth" (CEQA Guidelines §15126.2 (d)).

To assess the potential for growth-inducing impacts, this section examines the 2017 Plan in light of the following ways in which a project could induce growth:

- Fostering economic or population growth;
- Removal of obstacles to growth through the construction or extension of major infrastructure facilities that do not presently exist in the project area or through changes in existing regulations pertaining to land development;
- Adding development or encroachment into open space; and/or
- Setting a precedent that could encourage and facilitate other activities that could significantly affect the environment.

5.4.1 ECONOMIC AND POPULATION GROWTH

A project would directly induce growth if it would foster economic or population growth or the construction of new housing in the surrounding environment. The 2017 Plan is intended to accommodate the projected growth for the region while still resulting in compliance with the federal ozone and PM2.5 ambient air quality standards. As such, the 2017 Plan does not include policies that would encourage the development of new businesses or housing, or population-generating uses or infrastructure that would directly encourage such uses. The 2017 Plan, along with the Plan Bay Area, encourages development of housing near transit centers. However, the 2017 Plan does not change jurisdictional authority or responsibility concerning land use or property issues. Land use authority falls solely under the purview of the local governments and the Air District is specifically excluded from infringing on existing city or county land use authority (California Health & Safety Code §40414). Therefore, the 2017 Plan would not directly trigger new development or alter land use policies.

The 2017 Plan may result in construction activities associated with implementation of certain control measures (e.g., control equipment at existing stationary sources). However, the 2017 Plan would not directly or indirectly stimulate substantial population growth or necessitate the construction of new community facilities that could lead to additional growth in the Bay Area. It is expected that construction workers will be largely drawn from the existing workforce pool in northern California. Considering the existing workforce in the region, it is expected that a sufficient number of workers are available locally and that few workers would relocate for construction jobs potentially created by the 2017 Plan, as construction activities would be spread over a period of years. Further, the 2017 Plan would not be expected to result in an increase in local population, housing, or associated public services (e.g., fire, police, schools, recreation, and library facilities) since no increase in population or the permanent number of workers is expected due to the 2017 Plan. Likewise, the proposed project would not create new demand for secondary services, including regional or specialty retail, restaurant, recreation, or entertainment uses. As such, the 2017 Plan would not foster economic or population growth in the region in a manner that would be growth-inducing.

5.4.2 REMOVAL OF OBSTACLES TO GROWTH

A project would remove an obstacle to growth if it would expand existing infrastructure such as new roads or wastewater treatment plants. The 2017 Plan would not remove barriers to population growth, as it involves no changes to a General Plan, zoning ordinance, or a related land use policy. The 2017 Plan establishes a blueprint for compliance with ambient air quality standards in an urbanized area where adequate infrastructure is already in place to serve the existing population.

5.4.3 DEVELOPMENT OR ENCROACHMENTS INTO OPEN SPACE

Development can be considered growth-inducing when it is not contiguous to existing urban development and introduces development into open space areas. The proposed project is situated within the existing Bay Area, which is largely urbanized. The areas where construction activities may occur would be at existing stationary sources. Stationary sources are generally located within commercial and industrial (urbanized) areas. Any related construction activities would be expected to be within the confines of the existing facilities and would not encroach into open space.

5.4.4 PRECEDENT SETTING ACTION

The 2017 Plan is being prepared to comply with state and federal air quality planning regulations and requirements. These required approvals are routine compliance actions and would not set a precedent for future actions which could lead to growth.

5.4.5 CONCLUSION

The 2017 Plan is a roadmap for the Air District's efforts over the next few years to reduce air pollution and protect public health and the global climate. As such, and as was discussed above, the 2017 Plan is not expected to foster economic or population growth, remove obstacles to growth, encourage development or encroachments into open space, or set precedents for future actions which could lead to growth.

5.5 ENERGY CONSERVATION

Appendix F of the CEQA Guidelines calls for a discussion of the potential energy impacts of proposed projects in order to avoid or reduce "inefficient, wasteful and unnecessary consumption of energy." Wise and efficient use of energy is further defined as including: (1) decreasing overall per capita energy consumption; (2) decreasing reliance on fossil fuel such as coal, natural gas, and oil; and (3) increasing reliance on renewable energy sources.

The 2017 Plan is not expected to result in the use of large amounts of fuel or energy resources, or to result in the use of fuel or energy resources in a wasteful manner, or to conflict with existing adopted energy conservation plans. Implementation of the 2017 Plan includes control measures that seek to reduce electricity demand (EN2), decarbonize buildings (BL2), and reduce energy demand (BL1), which could decrease energy use and increase the amount of renewable energy supplies. Programs that encourage the decreased use of fossil fuels could increase the use of electricity and decrease the use of petroleum based fuels. Thus, the 2017 Plan would support the efficient use of energy by decreasing the use of fossil fuels and increasing the reliance on renewable energy sources, providing a beneficial long-term operational impact on energy conservation.

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CHAPTER 6 REFERENCES

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Organizations Consulted
Environmental Impact Report Preparers

6.0 REFERENCES

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6.2 ORGANIZATIONS CONSULTED

Bay Area Air Quality Management District
California Air Resources Board
Metropolitan Planning Commission

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CHAPTER 7.0

ACRONYMS

7.0 ACRONYMS

Acronym	**Full Name**
2017 Plan	2017 Clean Air Plan/Regional Climate Protection Strategy
AAQS	Ambient Air Quality Standards
AAs	Administering Agencies
AB	Assembly Bill
ABAG	Association of Bay Area Governments
ACE	Altamont Commuter Express
ACGIH	American Conference of Governmental Industrial Hygiene
ACWD	Alameda County Water District
af/yr	acre-feet per year
AMP	Alternative Maritime Power
APS	Alternative Planning Strategy
ARB	(California) Air Resources Board
ARP	Accidental Release Program
ASME	American Society of Mechanical Engineers
ATCM	Airborne Toxic Control Measure
BAAQMD	Bay Area Air Quality Management District
BACM	Best Available Control Measures
BACT	Best Available Control Technology
BAR	Bureau of Automotive Repair
BARCT	Best Available Retrofit Control Technology
BART	Bay Area Rapid Transit District
BARWRP	Bay Area Regional Water Recycling Program
BAWSCA	Bay Area Water Supply and Conservation Agency
BayREN	Bay Area Regional Energy Network
BC	Black Carbon
BCDC	San Francisco Bay Conservation and Development Commission
BMP	Best management practices
BNSF	Burlington Northern Santa Fe railroad
BOD	Biochemical oxygen demand
BSER	Best system of emission reduction
Btu	British Thermal Units
BUG	Back-up generator
CAFE	Corporate Average Fuel Economy
Cal EMA	California Emergency Management Agency
CalARP	California Accident Release Prevention Program
CalRecycle	California Department of Resources Recycling and Recovery
Caltrans	California Department of Transportation
CAP	Clean Air Plan (for State ozone standard)
CAPCOA	California Air Pollution Officers Association
CARB	California Air Resources Board
CARE	Community Air Risk Evaluation program
CCAA	California Clean Air Act

CCE	Community Choice Energy
CCR	California Code of Regulations
CCWD	Contra Costa Water District
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CH_4	Methane
CHMIRS	California Hazardous Materials Incident Reporting System
CHP	California Highway Patrol
CIWMB	California Integrated Waste Management Board
CIWMP	Countywide Integrated Waste Management Plan
CLEEN	Continuous Lower energy, Emissions, and Noise
CMA	Congestion Management Agency
CMAQ	Congestion Management and Air Quality (Improvement Program)
CMP	Congestion Management Program
CNEL	Community Noise Equivalent Level
CNG	Compressed Natural Gas
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CO_2e	CO2–equivalent (a metric to express the various GHGs in comparison to CO2)
CPSC	Consumer Products Safety Commission
CPUC	California Public Utilities Commission
CSI	California Solar Initiative
CSWRRA	California Solid Waste Reuse and Recycling Act
CTC	California Transportation Commission
CUPA	Certified Unified Program Agency
CVP	Central Valley Project
CWA	Clean Water Act
CWM	Chemical Waste Management
dB	Decibel
dBA	A-weighted decibel
Delta	Sacramento-San Joaquin Delta
DOE	(U.S.) Department of Energy
DOGGR	(California) Division of Oil, Gas, and Geothermal Resources
DOT	U.S. Department of Transportation
DPF	Diesel Particulate Filter
DPM	Diesel Particulate Matter
DSI	Dry Sorbent Injection
DTSC	Department of Toxic Substances Control
DWR	Department of Water Resources
EAP	Emergency Action Plan
EBMUD	East Bay Municipal Utility District
EGU	Electric generating unit
EHS	Extremely Hazardous Substance

EIA	(U.S.) Energy Information Administration
EIR	Environmental Impact Report
EISA	Energy Independence and Security Act of 2007
EMFAC	Emission factors (CARB model to calculate motor vehicle emissions)
EPA	(United States) Environmental Protection Agency
EPAct	Energy Policy Act
EPACT92	Energy Policy Act of 1992
EPCA	Energy Policy and Conservation Act
EPCRA	Emergency Planning and Community Right-to-Know Act
EPDC	Expected Peak Day Concentration
ERGP	Emergency Response Planning Guideline
ESP	Wet Electrostatic Precipitator
EV	Electric vehicle
FAA	Federal Aviation Administration
FCCU	Fluid Catalytic Cracking Unit
FEMA	Federal Emergency Management Agency
FGT	Flue Gas Treatment
FHWA	Federal Highway Administration
FMP	Flare Minimization Plan
FMVSS	Federal Motor Vehicle Safety Standard
FRA	Federal Railroad Administration
FSM	Further Study Measure
FTA	Federal Transit Administration
GHG	Greenhouse Gas
GWh	Gigawatt hours
GWP	Global Warming Potential
HAPs	Hazardous Air Pollutants
HEPA	High-efficiency particulate arrestance
HFCs	Hydrofluorocarbons
HMTA	Hazardous Materials Transportation Act
HOV	High-Occupancy Vehicle
HRA	Health Risk Assessment
HWCA	Hazardous Waste Control Act
HWMPs	Hazardous Waste Management Plans
Hz	Hertz (frequency)
I & M	(Motor Vehicle) Inspection and Maintenance Program (“Smog Check”)
ICE	Internal Combustion Engine
ICTA	International Center for Technology Assessment
IDLH	Immediately dangerous to life and health
IRWMP	Bay Area Integrated Regional Water Management Plan
ISO	Independent System Operator
ISR	Indirect Source Review
IWDP	Industrial Wastewater Discharge Permit
kWh	Kilowatt hours
LAER	Lowest Achievable Emissions Rate

LCFS	Low Carbon Fuel Standard
L_{dn}	Day/Night Noise Level
LEA	Local Enforcement Agencies
LEED	Leadership in Energy & Environmental Design
LEL	Lower Explosive Limit
L_{eq}	Equivalent Noise Level
LEV	Low Emission Vehicle
Li-ion	Lithium-ion battery
L_{max}	Maximum measured noise level
LOS	Levels of service
LPG	Liquid petroleum gases (propane or butane)
MACT	Maximum achievable control technology
MAP-21	Moving Ahead for Progress in the 21st Century
MEK	Methyl ethyl ketone
MMT	Million Metric Tons
MMWD	Marin Municipal Water District
MPO	Metropolitan Planning Organization
MRF	Material recovery facilities
MSDS	Material Safety Data Sheet
MTC	Metropolitan Transportation Commission
MW	Megawatt
N_2O	Nitrous oxide
NAAQS	National Ambient Air Quality Standards
NACE	National Association of Corrosion Engineers
NaOH	Sodium hydroxide, also known as lye or caustic soda
NCP	National Contingency Plan
NEC	National Electric Code
NEPA	National Environmental Policy Act
NESHAPs	National Emissions Standards for Hazardous Air Pollutants
NFC	National Fire Codes
NFIA	National Flood Insurance Act
NFIP	National Flood Insurance Program
NFPA	National Fire Protection Association
NH_3	Ammonia
NHTSA	National Highway Traffic Safety Administration
NiMH	Nickel–metal hydride battery
NIOSH	National Institute for Occupational Safety and Health
NOP/IS	Notice of Preparation/Initial Study
NO_x	Oxides of Nitrogen
NPDES	National Pollution Discharge Elimination System
NPDWR	National Primary Drinking Water Regulations
NSDWR	National Secondary Drinking Water Regulations
NSR	New Source Review
O_3	Ozone
OAK	Oakland International Airport

OBD	On-Board Diagnostic program
OEHHA	(California) Office of Environmental Health Hazard Assessment
OES	(California) Office of Emergency Services
OPR	(California) Office of Planning and Research
OSHA	Occupational Safety and Health Administration
Pa	Pascal
PACE	Property Assessed Clean Energy
PBA	Plan Bay Area
PCBTF	Parachlorobenzotrifluoride
PEL	Permissible exposure limit
PEV	Plug-in Electric Vehicle
PFCs	Perfluorocarbons
PG&E	Pacific Gas and Electric
PHMSA	(U.S. DOT, Office of) Pipeline and Hazardous Materials Safety Administration
PM	Particulate Matter
PM_{10}	Particulate Matter less than 10 microns in diameter
$PM_{2.5}$	Particulate Matter less than 2.5 microns in diameter
POTW	Publicly Owned Treatment Work
POU	Publicly Owned Utility
ppb	Parts per billion
pphm	Parts per hundred million
ppm	Parts per million
ppmv	Parts per million volume
PPV	Peak particle velocity
PSD	Prevention of Serious Deterioration
PSM	Process Safety Management
PTFE	Polytetrafluoroethylene
RACM	Reasonably Available Control Measure
RACT	Reasonably Available Control Technology
RCPS	Regional Climate Protection Strategy
RCRA	Resource Conservation and Recovery Act
RFP	Reasonable Further Progress
RFS	Renewable Fuel Standard
RMP	Risk Management Plan
RMS	Root-mean square
ROG	Reactive Organic Gases
RPS	Renewables Portfolio Standard
RSPA	Research and Special Programs Administration (branch of DOT)
RTP	Regional Transportation Plans
RWQCB	Regional Water Quality Control Board
SAE	Society of Automotive Engineers
SAFETEA-LU	Safe, Accountable, Flexible, and Efficient Transportation Equity Act
SB	Senate Bill
SBX7-7	Water Conservation Bill of 2009
SCAQMD	South Coast Air Quality Management District

SCE	Southern California Edison
SCR	Selective Catalytic Reduction
SCS	Sustainable Communities Strategy
SCVWD	Santa Clara Valley Water District
SDG&E	San Diego Gas & Electric
SDS	Safety Data Sheet
SDWA	Safe Drinking Water Act
SEL	Sound Exposure Level
SF_6	Sulfur hexafluoride
SFBRWQCB	San Francisco Bay Regional Water Quality Control Board
SFO	San Francisco International Airport
SFPUC	San Francisco Public Utilities Commission
SIP	State Implementation Plan
SJC	Norman Y. Mineta San José International Airport
SJVAPCD	San Joaquin Valley Air Pollution Control District
SLCP	Short-Lived Climate Pollutant
Solano CWA	Solano County Water Agency
Sonoma CW	Sonoma County Water Agency
SO_x	Sulfur dioxide
SPCC	Spill Prevention Control and Countermeasure
SRE	Source Reduction and Recycling Element
SRU	Sulfur Recovery Unit
STEL	Short-term exposure limit
STS	Charles M. Schulz Sonoma County Airport
SVCSD	Sonoma Valley County Sanitation District
SWFP	Solid Waste Facility Permits
SWP	State Water Project
SWPPP	Stormwater Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TAC	Toxic Air Contaminant
TBAC	Tetrabutylammonium chloride
TCC	Tagliabue closed Cup standard
TCE	Trichlorothylene
TCM	Transportation Control Measure
TFCA	(BAAQMD) Transportation Fund for Clean Air
TGU	Tail gas treatment unit
THC	Total hydrocarbons
TIP	Transportation Improvement Program
TLC	(MTC) Transportation for Livable Communities Program
TLV	Threshold limit value
TMC	Transportation Management Centers
TMDL	Total Maximum Daily Load
tpd	Tons per day
tpy	Tons per year
TRI	Toxic Release Inventory

TSCA	Toxic Substances Control Act
TSP	Total suspended particulates
TSS	Total suspended solids
TWA	Time-weighted average
U.S. ACE	United States Army Corp of Engineers
U.S. DOE	United States Department of Energy
U.S. DOT	United States Department of Transportation
U.S. EPA	United States Environmental Protection Agency
UEL	Upper Explosive Limit
UHI	Urban heat island
UP	Union Pacific Railroad
UST	Underground Storage Tank
UWMP	Urban Water Management Plan
VdB	Vibration decibels
VMS	Volatile methyl siloxanes
VMT	Vehicle miles traveled
VOC	Volatile organic compounds
VTA	Santa Clara Valley Transportation Authority
WDR	Waste Discharge Requirements
WGS	Wet Gas Scrubbers
ZEV	Zero Emission Vehicle
Zone 7	Zone 7 Water Agency

APPENDIX A

NOTICE OF PREPARATION/INITIAL STUDY

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Notice of Preparation/Initial Study

Bay Area Air Quality Management District

2016 Clean Air Plan/Regional Climate Protection Strategy

Draft Program Environmental Impact Report

To:	Interested Agencies, Organizations and Individuals
Project:	Draft Programmatic Environmental Impact Report – 2016 Clean Air Plan/Regional Climate Protection Strategy (2016 Plan)
Lead Agency:	Bay Area Air Quality Management District
Comment Period:	June 16, 2016 – July 18, 2016 (32 days)

Interested agencies, organizations and individuals are invited by the Bay Area Air Quality Management District (Air District) to comment on the scope and content of the environmental impact assessment that will be conducted for the 2016 Plan in compliance with the California Environmental Quality Act (CEQA). The 2016 Plan is an integrated multi-pollutant air quality plan for the nine-county San Francisco Bay Area Air Basin (BAAB). The multi-pollutant Plan addresses sources of ozone precursors, greenhouse gases, particulate matter, and/or toxic air contaminants, via an integrated control strategy that identifies co-benefits and dis-benefits of the control strategy on each of the pollutants.

The Air District is the lead agency undertaking preparation of a program-level Draft Environmental Impact Report (DPEIR) for the 2016 Plan. The 2016 Plan identifies 83 potential control measures to reduce air pollution from a variety of stationary and mobile sources located throughout the BAAB. The purpose of this Notice of Preparation/Initial Study (NOP/IS) is to seek comments about the scope and content of the environmental impact assessment that will be conducted for the 2016 Plan. Adoption and implementation of the 2016 Plan has the potential to result in environmental effects in the environmental impact areas identified in the Initial Study.

Written comments will be accepted via mail or email to:

Josh Pollak
Environmental Planner
Bay Area Air Quality Management District
375 Beale Street
San Francisco, Ca 94105

jpollak@baaqmd.gov

The Air District will also conduct a CEQA scoping meeting during the 30-day review period. A notice for the date and time of the scoping meeting will be sent out soon. All comments must be received by July 18, 2016. Please contact Josh Pollak if any special arrangements or assistance is needed for your review of the NOP/IS for the 2016 Plan.

Print Form

Appendix C

Notice of Completion & Environmental Document Transmittal

Mail to: State Clearinghouse, P.O. Box 3044, Sacramento, CA 95812-3044 (916) 445-0613
For Hand Delivery/Street Address: 1400 Tenth Street, Sacramento, CA 95814

SCH #

Project Title: 2016 Clean Air Plan/Regional Climate Protection Strategy

Lead Agency: Bay Area Air Quality Management District
Contact Person: Josh Pollak
Mailing Address: 375 Beale Street, Suite 600
Phone: 415-749-8435
City: San Francisco Zip: 94105 County: San Francisco

Project Location: County: 9 Bay Area Counties City/Nearest Community: ______
Cross Streets: ______ Zip Code: ______
Longitude/Latitude (degrees, minutes and seconds): ___° ___′ ___″ N / ___° ___′ ___″ W Total Acres: ______
Assessor's Parcel No.: ______ Section: ______ Twp.: ______ Range: ______ Base: ______
Within 2 Miles: State Hwy #: ______ Waterways: ______
Airports: ______ Railways: ______ Schools: ______

Document Type:

CEQA: ☒ NOP ☐ Early Cons ☐ Neg Dec ☐ Mit Neg Dec ☐ Draft EIR ☐ Supplement/Subsequent EIR (Prior SCH No.) ______ Other: ______
NEPA: ☐ NOI ☐ EA ☐ Draft EIS ☐ FONSI
Other: ☐ Joint Document ☐ Final Document ☐ Other: ______

Local Action Type:

☐ General Plan Update ☐ General Plan Amendment ☐ General Plan Element ☐ Community Plan
☐ Specific Plan ☐ Master Plan ☐ Planned Unit Development ☐ Site Plan
☐ Rezone ☐ Prezone ☐ Use Permit ☐ Land Division (Subdivision, etc.)
☐ Annexation ☐ Redevelopment ☐ Coastal Permit ☒ Other: Clean Air Plan

Development Type:

☐ Residential: Units ______ Acres ______
☐ Office: Sq.ft. ______ Acres ______ Employees ______
☐ Commercial: Sq.ft. ______ Acres ______ Employees ______
☐ Industrial: Sq.ft. ______ Acres ______ Employees ______
☐ Educational: ______
☐ Recreational: ______
☐ Water Facilities: Type ______ MGD ______
☐ Transportation: Type ______
☐ Mining: Mineral ______
☐ Power: Type ______ MW ______
☐ Waste Treatment: Type ______ MGD ______
☐ Hazardous Waste: Type ______
☒ Other: Clean Air Plan/Regional Climate Protection Strategy

Project Issues Discussed in Document:

☒ Aesthetic/Visual
☒ Agricultural Land
☒ Air Quality
☒ Archeological/Historical
☒ Biological Resources
☐ Coastal Zone
☐ Drainage/Absorption
☐ Economic/Jobs
☐ Fiscal
☐ Flood Plain/Flooding
☐ Forest Land/Fire Hazard
☒ Geologic/Seismic
☐ Minerals
☒ Noise
☒ Population/Housing Balance
☒ Public Services/Facilities
☒ Recreation/Parks
☐ Schools/Universities
☐ Septic Systems
☒ Sewer Capacity
☐ Soil Erosion/Compaction/Grading
☒ Solid Waste
☒ Toxic/Hazardous
☒ Traffic/Circulation
☐ Vegetation
☒ Water Quality
☐ Water Supply/Groundwater
☐ Wetland/Riparian
☐ Growth Inducement
☒ Land Use
☒ Cumulative Effects
☐ Other: ______

Present Land Use/Zoning/General Plan Designation:

Multi-Jurisdictional (Bay Area Counties)

Project Description: *(please use a separate page if necessary)*

The 2016 Clean Air Plan/Regional Climate Protection Strategy (2016 Plan) will be a roadmap for the Air District's efforts over the next few years to reduce air pollution and protect public health and the global climate. The 2016 Plan is required by the California Clean Air Act (CAA) to identify potential rules, control measures, and strategies for the Bay Area to implement in order to meet state standards for ozone. The CAP update will include the Bay Area's first comprehensive Regional Climate Protection Strategy, which will identify potential rules, control measures, and strategies that the Air District can pursue to reduce greenhouse gases in the Bay Area. The proposed 2016 Plan provides a strategy for reducing emissions of ozone precursors, greenhouse gases, particulate matter, and/or toxic air contaminants in the Bay Area.

Note: The State Clearinghouse will assign identification numbers for all new projects. If a SCH number already exists for a project (e.g. Notice of Preparation or previous draft document) please fill in.

Revised 2010

Reviewing Agencies Checklist

Lead Agencies may recommend State Clearinghouse distribution by marking agencies below with and "**X**".
If you have already sent your document to the agency please denote that with an "**S**".

- X Air Resources Board
- ____ Boating & Waterways, Department of
- ____ California Emergency Management Agency
- ____ California Highway Patrol
- ____ Caltrans District # ____
- ____ Caltrans Division of Aeronautics
- X Caltrans Planning
- ____ Central Valley Flood Protection Board
- ____ Coachella Valley Mtns. Conservancy
- ____ Coastal Commission
- ____ Colorado River Board
- ____ Conservation, Department of
- ____ Corrections, Department of
- ____ Delta Protection Commission
- ____ Education, Department of
- ____ Energy Commission
- X Fish & Game Region # 3
- ____ Food & Agriculture, Department of
- X Forestry and Fire Protection, Department of
- ____ General Services, Department of
- X Health Services, Department of
- X Housing & Community Development
- ____ Native American Heritage Commission
- ____ Office of Historic Preservation
- ____ Office of Public School Construction
- ____ Parks & Recreation, Department of
- ____ Pesticide Regulation, Department of
- ____ Public Utilities Commission
- ____ Regional WQCB # ____
- X Resources Agency
- X Resources Recycling and Recovery, Department of
- ____ S.F. Bay Conservation & Development Comm.
- ____ San Gabriel & Lower L.A. Rivers & Mtns. Conservancy
- ____ San Joaquin River Conservancy
- ____ Santa Monica Mtns. Conservancy
- ____ State Lands Commission
- ____ SWRCB: Clean Water Grants
- ____ SWRCB: Water Quality
- ____ SWRCB: Water Rights
- ____ Tahoe Regional Planning Agency
- X Toxic Substances Control, Department of
- X Water Resources, Department of
- ____ Other: ________
- ____ Other: ________

Local Public Review Period (to be filled in by lead agency)

Starting Date 6/16/2016 Ending Date 7/16/2016

Lead Agency (Complete if applicable):

Consulting Firm: Environmental Audit, Inc.
Address: 1000-A Ortega Way
City/State/Zip: Placentia, CA 92870
Contact: Debra Bright Stevens
Phone: 714-632-8521

Applicant: Bay Area Air Quality Management District
Address: 375 Beale Street, Suite 600
City/State/Zip: San Francisco, CA 94105
Phone: 415-749-8435

Signature of Lead Agency Representative: Jose Pollak **Date:** 6/15/16

Authority cited: Section 21083, Public Resources Code. Reference: Section 21161, Public Resources Code.

Notice of Preparation

To: State Clearinghouse
P.O. Box 3044
Sacramento, CA 95812-3044
(Address)

From: Bay Area Air Quality Management District
375 Beale St, Suite 600
San Francisco, CA 94105
(Address)

Subject: Notice of Preparation of a Draft Environmental Impact Report

The Bay Area Air Quality Management District will be the Lead Agency and will prepare an environmental impact report for the project identified below. We need to know the views of your agency as to the scope and content of the environmental information which is germane to your agency's statutory responsibilities in connection with the proposed project. Your agency will need to use the EIR prepared by our agency when considering your permit or other approval for the project.

The project description, location, and the potential environmental effects are contained in the attached materials. A copy of the Initial Study (☒ is ☐ is not) attached.

Due to the time limits mandated by State law, your response must be sent at the earliest possible date but not later than 30 days after receipt of this notice.

Please send your response to Josh Pollak at the address shown above. We will need the name for a contact person in your agency.

Project Title: 2016 Clean Air Plan/Regional Climate Protection Strategy

Project Applicant, if any: Bay Area Air Quality Management District

Date 6/15/16

Signature Josh Pollak

Title Environmental Planner

Telephone 415-749-8435

Reference: California Code of Regulations, Title 14, (CEQA Guidelines) Sections 15082(a), 15103, 15375.

Initial Study for the
Bay Area Air Quality Management District

2016 Clean Air Plan/Regional Climate Protection Strategy

Prepared for:

Bay Area Air Quality Management District
939 Ellis Street
San Francisco, CA 94109
Contact: Josh Pollak
(415) 749-8435

Prepared By:

Environmental Audit, Inc.
1000-A Ortega Way
Placentia, CA 92870
Contact: Debra Bright Stevens
(714) 632-8521

June 2016

2016 Clean Air Plan/Regional Climate Protection Strategy

Notice of Preparation/Initial Study

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CHAPTER 1

PROJECT DESCRIPTION

1.0 PROJECT DESCRIPTION

1.1 INTRODUCTION

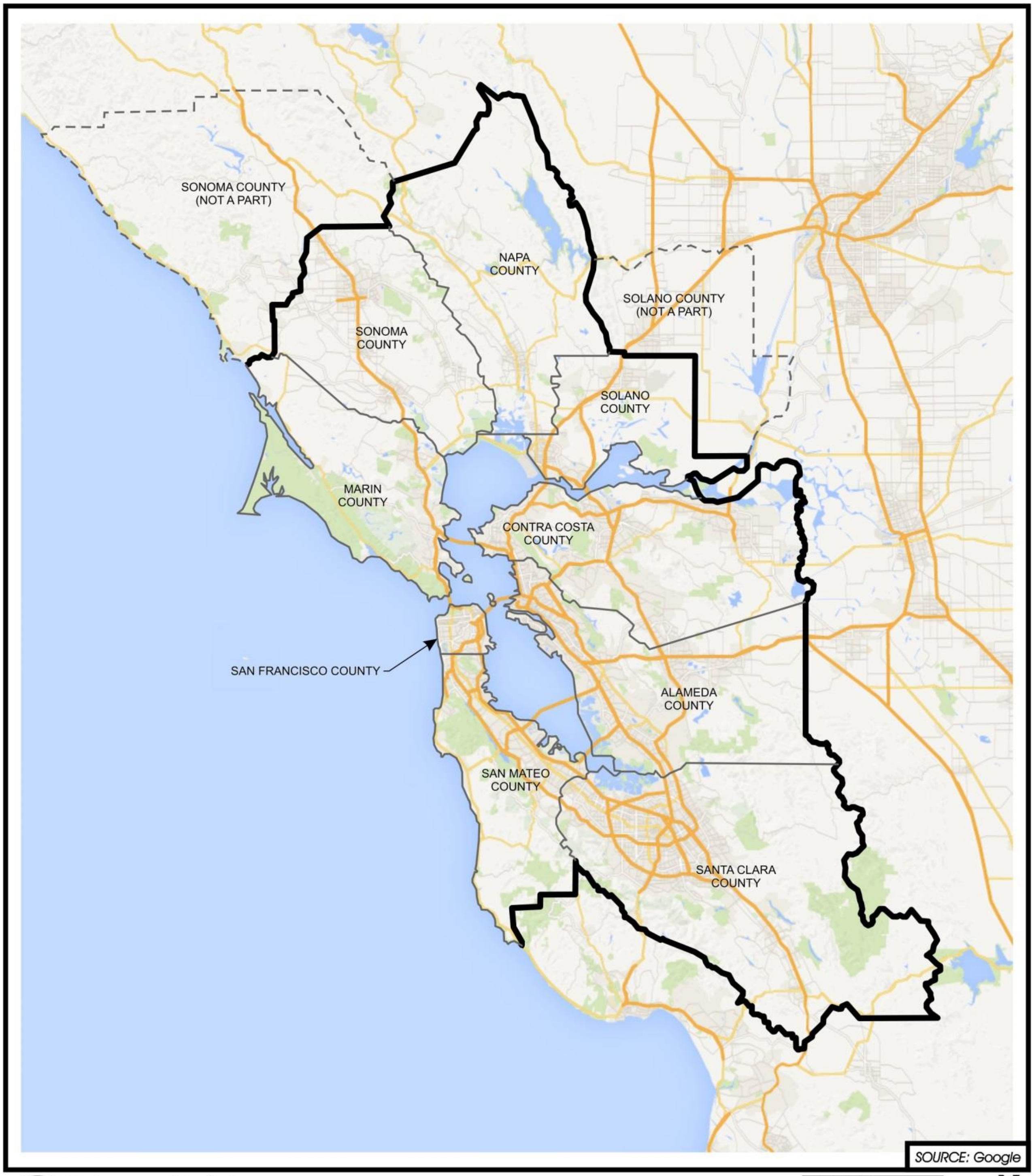
The Bay Area Air Quality Management District (Air District), in partnership with the Association of Bay Area Governments (ABAG), the Bay Area Conservation and Development Commission, and the Metropolitan Transportation Commission (MTC), is preparing the 2016 Clean Air Plan/Regional Climate Protection Strategy (2016 Plan). The 2016 Plan will be a roadmap for the Air District's efforts over the next few years to reduce air pollution and protect public health and the global climate. The 2016 Plan is required by the California Clean Air Act (CAA) to identify potential rules, control measures, and strategies for the Bay Area to implement in order to meet state standards for ozone. The 2016 Plan will include the Bay Area's first comprehensive Regional Climate Protection Strategy, which will identify potential rules, control measures and strategies that the Air District can pursue to reduce greenhouse gases in the Bay Area. The 2016 Plan will provide a strategy for reducing emissions of ozone precursors, greenhouse gases, particulate matter, and/or toxic air contaminants in the Bay Area.

1.2 AGENCY AUTHORITY

CEQA, Public Resources Code §21000 et seq., requires that the environmental impacts of proposed projects be evaluated and that feasible methods to reduce, avoid or eliminate significant adverse impacts of these projects be identified and implemented. The Air District will be required to conduct such an analysis for the actions it takes to implement the measures contained in the 2016 Plan . For example, the Air District will be required to evaluate the potential for such impacts when it adopts new regulations to control air pollution as contemplated by the 2016 Plan control strategy, and it will be required to prepare and certify an Environmental Impact Report (EIR) where it appears that a regulation may have the potential for significant adverse impacts.

In addition, the Air District is also conducting a CEQA environmental analysis of the 2016 Plan as a whole through a Program EIR. Agencies may prepare a Program EIR for a document such as the 2016 Plan, which covers a series of actions that are related in connection with the issuance of rules, regulations, Plans, or other criteria to govern the conduct of a continuing program (CEQA Guidelines Section 15168(a)(3)). The Program EIR will evaluate whether the 2016 Plan may result in any significant adverse environmental impacts from the actions taken to implement it.

To fulfill the purpose and intent of CEQA, the Air District is the lead agency for the Program EIR for the 2016 Plan, and it has prepared the Notice of Preparation/Initial Study for the Program EIR. The Lead Agency is the "public agency that has the principal responsibility for carrying out or approving a project that may have a significant effect upon the environment" (Public Resources Code Section 21067). The Air District has the primary responsibility for supervising or approving the 2016 Plan and is the most appropriate public agency to act as lead agency (CEQA Guidelines Section 15051(b)).



Environmental Audit, Inc.

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BAY AREA AIR QUALITY MANAGEMENT DISTRICT

Project No. 2997 Figure 1-1

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1.3 PROJECT LOCATION

The BAAQMD has jurisdiction of an area encompassing 5,600 square miles. The Air District includes all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties, and portions of southwestern Solano and southern Sonoma counties. The San Francisco Bay Area is characterized by a large, shallow basin surrounded by coastal mountain ranges tapering into sheltered inland valleys. The combined climatic and topographic factors result in increased potential for the accumulation of air pollutants in the inland valleys and reduced potential for buildup of air pollutants along the coast. The Basin is bounded by the Pacific Ocean to the west and includes complex terrain consisting of coastal mountain ranges, inland valleys and bays (see Figure 1-1).

1.4 BACKGROUND

The California CAA requires regions that do not meet the State ambient air quality standards to prepare Plans for attaining the standards, and to these Plans every three years. In summary, these Plans must include estimates of current and future emissions of the pollutants that form ozone, and a control strategy, including “all feasible measures,” to reduce these emissions. The Plans must also address the transport of air pollutants to certain neighboring regions.

The first Bay Area Plan for the State ozone standards was the 1991 Clean Air Plan. Subsequently, the Clean Air Plan was revised in 1994, 1997, 2000, 2005, and 2010. Each of these Plans proposed additional measures to reduce emissions from a wide range of sources, including industrial and commercial facilities, motor vehicles, and “area sources.” The 2010 CAP is the most recent adopted Plan for the Bay Area to achieve the State ozone standards.

The 2016 Plan will provide a multi-pollutant approach to air quality Planning in the Bay Area. The multi-pollutant Plan addresses ozone precursors, greenhouse gases, particulate matter, and/or toxic air contaminants, via an integrated control strategy that identifies co-benefits and disbenefits of the control strategy on each of the pollutants.

Ground-level ozone can cause respiratory problems and premature mortality, especially among sensitive populations, such as children, seniors, and people with lung conditions. Ozone also reduces crop yields and accelerates deterioration of paints, finishes, rubber products, plastics, and fabrics. Both the U.S. Environmental Protection Agency (U.S. EPA) and the California Air Resources Board (CARB) have established health-based ambient air standards for ground-level ozone. The California ozone standards are currently set at 0.09 parts per million (ppm) averaged over one hour, and 0.07 ppm averaged over eight hours. The San Francisco Bay Area air basin is designated as a non-attainment area for both the California 1-hour ozone standard and the California 8-hour ozone standard.

Because ozone is formed through chemical reactions between reactive organic gases (ROG) and nitrogen oxides (NOx) in the presence of sunlight, efforts to reduce ozone seek to limit emissions of ROG and NOx into the atmosphere. In general, ROG comes from evaporation or incomplete combustion of fuels, from the use of solvents in cleaning operations and in paints and other coatings, and in various industrial and commercial operations. NOx is produced through combustion of fuels by mobile sources – cars, trucks, construction equipment, locomotives, aircraft, marine vessels – and stationary sources such as power Plants and other industrial facilities.

Exceedances of the California and national ozone standards in the Bay Area have decreased significantly with the regulation and reduction of ozone precursor emissions (i.e. ROG and NOx). This improvement is due to State and national regulations requiring cleaner motor vehicles and fuels, District regulations requiring reduced emissions from industrial and commercial sources, as well as programs to reduce the use of motor vehicles.

Greenhouse gases (GHG) refer to gases that contribute to global warming. In addition to negative impacts on air quality as higher temperatures contribute to increased levels of ozone and PM, climate change may cause a wide range of ecological, social, economic, and demographic impacts at both the global and the local scale. The 2016 Plan will seek to maximize reductions of greenhouse gases, primarily carbon dioxide (CO_2) and methane, in crafting a control strategy to reduce ambient concentrations of ozone precursors, greenhouse gases, particulate matter, and/or toxic air contaminants

Particulate matter includes fine particulate matter (particulate matter less than 2.5 microns in diameter or $PM_{2.5}$) and coarser particles (particulate matter less than 10 microns in diameter or PM_{10}). While PM_{10} is directly emitted as dust and smoke, $PM_{2.5}$ is a complex pollutant that is both directly emitted as well as created by secondary formation via chemical reactions in the atmosphere, including transforming: 1) NOx and ammonia to ammonium nitrate; and 2) sulfur dioxide and ammonia to ammonium sulfate, among others. PM has been documented to cause a wide range of health effects including bronchitis, asthma, heart attacks, and mortality.

There are hundreds of toxic air contaminants (TAC) (e.g. diesel PM, benzene, 1,3-butadiene, formaldehyde, acetaldehyde, hexavalent chromium, etc.) that can cause a wide range of acute and chronic health effects, including cancer and mortality. There are no ambient air quality standards for TACs.

1.5 PROJECT DESCRIPTION

The 2016 Plan will include an assessment of the region's progress toward attaining the California ozone standards and reducing air pollution to protect public health and the global climate. The State has not set a deadline to attain the California ozone standards. The 2016 Plan will identify "all feasible measures," as required by the California CAA, for control of ozone precursors that will assist the Bay Area in attaining the California ozone standards and address pollutant transport to downwind regions. The 2016 Plan will be prepared in accordance with applicable provisions of the California CAA. It will update the Bay Area 2010 CAP adopted by the District Board of Directors in September, 2010.

Measures included in the 2016 Plan are designed and intended to produce environmental benefits by reducing emissions of ozone precursors, GHGs, and other air pollutants. However, some measures may also result in certain ancillary adverse environmental impacts, for example by requiring the use of an emission reduction technology that itself may cause some adverse impact. The environmental review of the 2016 Plan will evaluate whether there will be any significant adverse environmental impacts as a result of any such ancillary effects. Table 1-1 contains a summary list of proposed control measure implementation actions that will be included in the 2016 Plan. Full control measure write ups can be reviewed at the following location on the Air District's website. (http://www.baaqmd.gov/in-your-community/open-air#peak_democracy)

1.5.1 OVERVIEW OF THE CONTROL STRATEGY

The 2016 Plan control strategy will consist of a comprehensive set of control measures to reduce emissions from both stationary sources and mobile sources. Proposed control measures in the 2016 Plan will augment the extensive federal, state, regional and local regulations and programs that are already in place. The 2016 Plan will include the following nine categories of measures:

Agriculture control measures such as anaerobic digestion and the installation of digesters to reduce air, energy, hazard and waste impacts;

Buildings control measures to promote energy efficiency (alternative and renewable forms) and urban heat island mitigation via cool roofing, cool paving, tree-Planting, and ventilation;

Energy control measures to maximize the amount of renewable energy contributing to the production of electricity within the Bay Area as well as electricity imported into the region, and to adopt additional energy-efficiency policies and programs;

Natural Working Lands control measures to promote focused growth and minimize population exposure to air pollutants in impacted communities;

Short-lived Climate Pollutant control measures to reduce methane from landfills and farming activities through various control measures and develop a GHG air monitoring Plan for the Bay Area;

Stationary Source control measures based upon the District's authority to regulate emissions from sources such as manufacturing facilities and power generating facilities;

Transportation control measures to reduce motor vehicle use, promote alternative modes of transportation, reduce traffic congestion, and promote efficient vehicle use via the use of cleaner vehicles and fuels and to accelerate the retrofit or replacement of high-emitting vehicles and equipment;

Waste control measures to minimize emissions from landfills and promote recycling and waste reduction; and

Water control measures to reduce GHG emissions from Publicly Owned Treatment Works (POTWs) while reducing water consumption and increasing on-site water recycling.

Table 1-1 below provides a list and brief description of the control measures being considered for the 2016 Plan. Full control measure write ups can be reviewed at the following location on the Air District's website. (http://www.baaqmd.gov/in-your-community/open-air#peak_democracy)

TABLE 1-1

PROPOSED CONTROL MEASURES – BAAQMD 2016 Plan			
Control Measure Number	**Name**	**Pollutant**	**Implementation Actions**
Stationary Sources			
SS-1	Fluid Catalytic Cracking in Refineries	PM	Establish emission limits to reduce secondary PM emissions at FCCUs. Work with FCCU operators to provide sampling ports that will allow a source-test program using EPA Method 202 to quantify total FCCU PM emissions, including condensable PM. Evaluate progress in ammonia optimization, as well as the results of Method 202 testing, to determine appropriate further actions.
SS-2	Equipment Leaks	VOC	Reduce fugitive TOG emissions, including methane, from refineries, chemical Plants, bulk Plants and bulk terminals. Develop an implementation Plan for Rule 8-18 to require future monitoring of equipment in heavy liquid service, require facilities to identify the causes of background readings greater than 50 ppmv, etc.
SS-3	Cooling Towers	VOCs, TACs	Establish hydrocarbon limits for cooling towers.
SS-4	Refinery Flares	All Pollutants	Review the results of refinery flare monitoring Rule 12-11 and flare reduction rule 12-12 at each of the five refineries in the Bay Area to identify amendments that may make the rules more effective at reducing emissions.
SS-5	Sulfur Recovery Units	SO_2	Consider amendments to Air District Rule 9-1 to achieve the lowest SO_2 emissions feasible at sulfur recovery units without the addition of caustic scrubbing.
SS-6	Refinery Fuel Gas	SO_2	Consider amendments to Rule 9-1 that would reduce the sulfur limits for RFG and determine the appropriate averaging periods.
SS-7	Sulfuric Acid Plants	SO_2	Consider amendments to Rule 9-1 that would limit SO_2 emissions from acid Plants associated with petroleum refining.
SS-8	Coke Calcining	PM and SO_2	Limit SO_2 emissions from petroleum coke calcining operations equivalent to meet a mass emissions limit of 1,050 TPY and an hourly limit of 320 pounds per hour. Operator's must comply with the SO_2 pounds per hour emission limit by January 1, 2019 and with the tons per year emission limit by January 1, 2020.
SS-9	Enhanced NSR Enforcement for Changes in Crude Slate	All Pollutants	Would provide for enhanced enforcement of the Air District's NSR permitting requirements when a refinery changes its crude slate. Would provide a legal mechanism for the District to review all significant crude slate changes to allow the Air District to ensure that all applicable NSR permitting requirements are being complied with.
SS-10	Petroleum Refining Emissions Tracking	All Pollutants	This control measure would implement a newly adopted rule (Regulation 12-15) which will: 1) improve petroleum refinery emissions inventories of criteria pollutants, toxic air contaminants (TACs) and greenhouses gases (GHGs), 2) collect volume and composition data on crude oil and other feedstocks processed by refineries, 3) expand refinery fenceline air monitoring and community air monitoring, and 4) collect information about equipment and operational practices where refinery energy utilization could be improved so that GHG emissions could be reduced.
SS-11	Petroleum Refining Emissions Reductions	All Pollutants	This control measure would evaluate rulemaking options to reduce climate pollutants, and associated criteria and toxic air emissions, from Bay Area refineries. Options include refinery-wide or individual process energy efficiency requirements, a refinery-wide emissions cap, or focusing on methane emissions.

PROPOSED CONTROL MEASURES – BAAQMD 2016 Plan			
Control Measure Number	**Name**	**Pollutant**	**Implementation Actions**
SS-12	Oil and Gas Production, Processing and Storage	All Pollutants	Propose a new rule to limit emissions from oil and natural gas production, processing and storage operations.
SS-13	Methane Reductions from Capped Wells	VOCs, GHG, and TACs	Estimate the magnitude and approximate composition of the fugitive emissions from Bay Area capped wells. Establish emission limits for methane to support CARB's AB32 Scoping Plan and the Air District's GHG reduction goals. Adopt thresholds for VOC and toxic pollutant emissions from relevant existing regulations.
SS-14	Natural Gas Processing and Distribution	GHG	Review the utility-reported data, when available, to glean additional information on GHG emissions and practices used to prevent and minimize methane emissions. Continue to participate in the CPUC regulatory process.
SS15	Methane Leaks and Exemptions in Existing Rules	GHG	Examine the emissions information from source tests and other data sources to ascertain if emissions of methane could be reduced by control or by elimination of the exemption in Air District rules.
SS-16	GHG BACT Threshold	GHG	Revise Air District rules to reduce the threshold at which facilities must implement "Best Available Control Technology" to control their GHG emissions.
SS-17	Portland Cement	SO_2, GHG and PM	Amend sections of existing Air District Rule 9-13 pertaining to ammonia emissions to allow for replacement of the rolling 24-hour average with a different operating day averaging period for ammonia emissions. Amend 9-13 to impose a standard for SO_2 consistent with other Air District rules; amend the rule as necessary to incorporate language regarding detached plumes, and consider amendments to the rule to reduce GHG emissions.
SS-18	Revisions to Air Toxics Hotspots Program	TACs	Propose revisions to the Air District's Air Toxics Hotspots program for existing facilities to incorporate more stringent risk reduction requirements.
SS-19	New Source Review for Toxics	TACs	Propose revisions to Air District Regulation 2-5, New Source Review of Toxic Air Contaminants, based on OEHHA's 2015 risk assessment guidelines and CARB/CAPCOA's 2015 risk management guidelines. Revise the Air District's health risk assessment trigger levels for each toxic air contaminant using the 2015 guidelines and most recent health effects values.
SS-20	Stationary Gas Turbines	NOx	Reduce nitrogen oxide emissions from stationary gas turbines.
SS-21	Biogas Flares	NOx	Develop a new Air District rule to reduce NOx from non-refinery flares and investigate potential for more stringent limits on emissions from non-refinery flares.
SS-22	Sulfur Content Limits of Liquid Fuels	SO_2, PM	Revise Rule 9-1 to include fuel-specific sulfur content limits for diesel and other liquid fuels.
SS-23	Coatings, Solvents, and Lubricants and Adhesives	VOC	Review existing Air District rules and compare the VOC limits with limits in other Air District rules; propose more stringent VOC limits as appropriate.
SS-24	Surface Prep and Cleaning Solvent	VOC	Lower the VOC limits for surface preparation, cleanup, and equipment cleaning in Air District Rules 8-24, 8-29, 8-30, 8-35, and 8-38.
SS-25	Digital Printing	VOC	Reduce emissions of VOCs from digital printers.
SS-26	LPG, Propane, Butane	VOC	Investigate potential VOC reductions by regulating filling of, and leakage from LPG, propane and butane tanks.
SS-27	Asphaltic Concrete	VOC	Evaluate the cost effectiveness, and feasibility of limiting solvent content of emulsified asphalt and the availability of substitutes to diesel to clean asphalt related equipment.
SS-28	Residential Fan Type Furnaces	NOx, CO	Reduce NOx emission limits on new and replacement central furnace installations.
SS-29	General PM Emission Limitations	PM	Reduce or revise the Air District's allowable weight rate limitations for particulate matter.

PROPOSED CONTROL MEASURES – BAAQMD 2016 Plan			
Control Measure Number	**Name**	**Pollutant**	**Implementation Actions**
SS-30	Emergency Backup Generators	All Pollutants	Develop and implement strategies to reduce emissions from older backup generators emitting at the highest levels. These strategies may include regulations, incentives or a combination of both.
SS-31	Commercial Cooking Equipment	PM	Consider PM limits for additional commercial cooking sources, specifically underfire charbroilers.
SS-32	Wood Smoke	PM	Consider further limits on wood burning, including additional limits to exemptions from Air District Rule 6-3: Wood Burning Devices.
SS-33	PM from Coke and Coal Storage and Handling	PM	Develop Air District rule limits to prevent and control wind-blown fugitive dust from petroleum coke and coal storage and handling operations. Establish enforceable visible emission limits to support preventive measures such as water sprays, enclosures, and wind barriers.
SS-34	PM from Trackout	PM	Develop new Air District rule to prevent mud/dirt and other solid track-out from construction, landfills, quarries and other bulk material sites.
SS-35	PM from Asphalt Operations	PM	Develop an Air District rule to require abatement/control of blue smoke emissions related to asphalt delivery to roadway paving projects.
SS-36	Fugitive Dust	PM	Consider applying the Air District's proposed fugitive dust visible emissions limits to a wider array of sources.
SS-37	Enhanced Air Quality Monitoring	All Pollutants	Ensure representative air quality data is being collected in impacted communities. Partner with County Health Departments to identify areas of poor air quality and collaborate with the community on ways to potentially measure and reduce exposure and emissions from local and regional sources. Require petroleum refineries to prepare and submit to the Air District an air monitoring Plan for establishing an air monitoring system. Implement the Community Monitoring Program.
SS-38	Odors	odors	Propose amendments to Regulation 7 to strengthen odor standards and enhance enforceability. An evaluation of newer air monitoring technologies will be aimed at increasing enforceability of the rule with respect to a wider range of odorous compounds and sources.
Transportation			
TR-1	Clean Air Teleworking Initiative	All Pollutants	Promote teleworking on Spare the Air Days. Develop teleworking best practices for employers and develop additional strategies to promote telecommuting.
TR-2	Trip Reduction Programs	All Pollutants	Encourage trip reduction policies and programs in local Plans, e.g. general and specific Plans while providing grants to support trip reduction efforts. Encourage local governments to require mitigation of vehicle travel as part of new development approval, adopt transit benefits ordinances in order to reduce transit costs to employees, and to develop innovative ways to encourage rideshare, transit, cycling, and walking for work trips. Pursue legislation to authorize the extension of the Commuter Benefits Program on a long-term basis. Fund various employer-based trip reduction programs.
TR-3	Local and Regional Bus Service	All Pollutants	Fund local and regional bus projects.
TR-4	Local and Regional Rail Service	All Pollutants	Fund local and regional rail service projects.
TR-5	Transit Efficiency and Use	All Pollutants	Improve transit efficiency and make transit more convenient for riders through continued operation of 511 Transit, full implementation of Clipper® fare payment system and the Transit Hub Signage Program

PROPOSED CONTROL MEASURES – BAAQMD 2016 Plan			
Control Measure Number	**Name**	**Pollutant**	**Implementation Actions**
TR-6	Freeway and Arterial Operations	All Pollutants	Fund freeway and arterial operations.
TR-7	Safe Routes to Schools and Safe Routes to Transit	All Pollutants	Provide funds for the regional Safe Routes to School and Safe Routes to Transit Programs.
TR-8	Ridesharing, Last-Mile Connection	All Pollutants	Promote carpooling and vanpooling by providing funding to continue regional and local ridesharing programs, and support the expansion of car-sharing programs. Provide incentive funding for pilot projects to evaluate the feasibility and cost-effectiveness of innovative ridesharing and other last-mile solution trip reduction strategies. Encourage employers to promote ridesharing and car-sharing to their employees.
TR-9	Bicycle Access and Pedestrian Facilities	All Pollutants	Encourage Planning for bicycle and pedestrian facilities in local Plans, e.g. general and specific Plans, fund bike lanes, routes, paths, and bicycle parking facilities.
TR-10	Land Use Strategies	All Pollutants	Support implementation of Plan Bay Area, maintain web portal with current climate action Plans and other local best practices, and collaborate with regional partners to identify innovative funding mechanisms to help local governments address air quality and climate change in their general Plans.
TR-11	Value Pricing	All Pollutants	Implement and/or consider various value pricing strategies.
TR-12	Smart Driving	All Pollutants	Implement smart driving programs with businesses, public agencies and possibly schools and fund smart driving projects.
TR-13	Parking Policies	All Pollutants	Encourage parking policies and programs in local Plans, e.g. reduce minimum parking requirements; limit the supply of off-street parking in transit-oriented areas; unbundling the price of parking spaces; etc.
TR-14	Cars and Light Trucks	All Pollutants	Commit regional clean air funds toward qualifying vehicle purchases and infrastructure development. Partner with private, local, state and federal programs to promote the purchase and lease of battery-electric and plug-in hybrid electric vehicles.
TR-15	Public Outreach and Education	All Pollutants	Implement the Spare the Air Every Day Campaign including Spare the Air alerts, employer program, and community resource teams, a PEV Outreach campaign, and the Spare the Air Youth Program.
TR-16	Indirect Source Review	All Pollutants	Consider a rule that sets air quality performance standards for new and modified development projects.
TR-17	Planes	NOx	Work with the appropriate partners to increase the use of cleaner burning jet fuel and low-NOx engines in commercial jets arriving and departing the Bay Area.
TR-18	Goods Movement	All Pollutants	Continue participation in the preparation of the Regional Goods Movement Plan. Participate in the Goods Movement Collaborative, led by the Alameda County Transportation Commission, and assist MTC in development of the Freight Emissions Action Plan.
TR-19	Medium- and Heavy-Duty Trucks	All Pollutants	Provide incentives to accelerate the replacement of heavy-duty on-road diesel engines in advance of CARB's in-use heavy-duty truck regulation. Provide funding to demonstrate hybrid drive trains for medium- and heavy-duty trucks, to demonstrate battery electric trucks, and to support further development of hydrogen fuel cell trucks. Continue to operate a trailer at the Port of Oakland to inform truck drivers about ARB's applicable anti-idling requirements, emission reducing technologies and fuels.
TR-20	Ocean Going Vessels	All Pollutants	Develop a Green Ports incentive program in collaboration with the Ports of Oakland, San Francisco, Richmond, & Redwood City.

PROPOSED CONTROL MEASURES – BAAQMD 2016 Plan			
Control Measure Number	**Name**	**Pollutant**	**Implementation Actions**
TR-21	Commercial Harbor Craft	All Pollutants	Focus on assisting fleets to achieve early compliance with the CARB harbor craft air toxic control measure and supporting research efforts to develop and deploy more efficient engines and cleaner, renewable fuels for harbor craft.
TR-22	Construction and Farming Equipment	All Pollutants	Provide incentives for the early deployment of electric, Tier 3 and 4 off-road engines used in construction, freight and farming equipment. Support field demonstrations of advanced technology for off-road engines and hybrid drive trains.
TR-23	Lawn and Garden Equipment	All Pollutants	Seek additional funding to expand the Commercial Lawn and Garden Equipment Replacement Program into all nine Bay Area counties. Explore options to expand Lawn and Garden Equipment Program to cover shredders, stump grinders, and commercial turf equipment.
Buildings			
BL-1	Green Buildings	All Pollutants	Partner with KyotoUSA to identify energy-related improvements and opportunities for onsite renewable energy systems in school districts; investigate funding strategies to implement upgrades. Identify barriers to effective local implementation of the CALGreen (Title 24) statewide building energy code; develop solutions to improve implementation/enforcement. Work with ABAG's BayREN program to make additional funding available for energy-related projects in the buildings sector. Engage with partners (e.g., BayREN) to target reducing emissions from specific types of buildings or certain geographic areas.
BL-2	Decarbonize Buildings	All Pollutants	Explore potential Air District rule-making options such as limiting the sale of fossil fuel-based space and water heating systems for both residential and commercial use. Explore incentives for property owners to replace their furnace, water heater or natural-gas powered appliances with zero-carbon alternatives. the Air District's CEQA Guidelines to recommend that all commercial and multi-family developments install ground source heat pumps and solar hot water heaters as an air quality/GHG mitigation measure.
BL-3	Market Solutions	All Pollutants	Implement a call for innovation to support market-based approaches that bring new, viable solutions to significantly reduce GHG emissions associated with existing buildings.
BL-4	Heat Island Mitigation	All Pollutants	Develop and promote adoption of a model ordinance for "cool parking" that promotes the use of cool surface treatments for new parking facilities as well existing parking lots undergoing resurfacing. Develop and promote adoption of model building code requirements for new construction or re-roofing/roofing upgrading for commercial and residential multi-family housing. Collaborate with expert partners to perform outreach to cities and counties to make them aware of cool roofing and cool paving techniques, having white roofs on their fleets, and of new tools available
Energy			
EN-1	Decarbonize Electricity	All Pollutants	Engage with PG&E, municipal electric utilities and CCAs to maximize the amount of renewable energy contributing to the production of electricity within the Bay Area as well as electricity imported into the region. Engage with stakeholders including dairy farms, forest managers, water treatment facilities, food processors, public works agencies and waste management to increase use of biomass in electricity production.

PROPOSED CONTROL MEASURES – BAAQMD 2016 Plan			
Control Measure Number	**Name**	**Pollutant**	**Implementation Actions**
EN-2	Decrease Electricity Demand	All Pollutants	Work with local governments to adopt additional energy-efficiency policies and programs. Support local government energy efficiency program via best practices, model ordinances, and technical support. Work with partners to develop messaging to decrease electricity demand during peak times.
Agriculture			
AG-1	Agricultural Guidance and Leadership	GHG	This measure includes actions to reduce GHGs from the agriculture sector, including working to obtain funding for on-farm GHG reduction activities; promoting carbon farm Plans; providing guidance to local governments on including carbon-based conservation farming measures and carbon sequestration in local climate actions Plans; and conducting outreach to agriculture businesses on best practices, including biogas recovery, to reduce GHG emissions.
AG-2	Dairy Digesters	GHG	This measure will promote implementation of dairy digester facilities (also known as biogas recovery) at farms to capture methane as an energy source and to reduce methane emissions.
AG-3	Enteric Fermentation	GHG	This measure includes dietary strategies and grazing management measures to reduce methane emissions from enteric fermentation.
AG-4	Livestock Waste	PM, VOC, and ammonia	This measure would require best management practices already being implemented in the SJVAPCD and SCAQMD to be applied at Bay Area dairies and other confined animal facilities.
Natural and Working Lands			
NW-1	Carbon Sequestering in Rangelands	GHG	Include off-site mitigation of GHG emissions through carbon sequestration projects in the Air District's CEQA guidance and comments. Develop climate action Plan guidance and/or best practices on soil management for local agencies and farmers and their associations to maximize GHG sequestration on rangelands.
NW-2	Urban Tree Planting	Criteria pollutants and GHG	Develop or identify an existing model municipal tree Planting ordinance and encourage local governments to adopt such an ordinance. Include tree Planting recommendations the Air District's technical guidance, best practices for local Plans and CEQA review.
NW-3	Carbon Sequestration in Wetlands	GHG	Identify federal, state and regional agencies, and collaborative working groups that the Air District can assist with technical expertise, research or incentive funds to enhance carbon sequestration in wetlands around the Bay Area. Assist agencies and organizations that are working to secure the protection and restoration of wetlands in the San Francisco Bay.
Waste			
WA-1	Landfills	GHG, VOC, and TACs	Propose amendments to Air District Rule 8-34 to increase stringency of emission limits, including fugitive leak standards, and improve consistency with federal rules.
WA-2	Composting and Anaerobic Digesters	GHG, VOC, and PM	Develop an Air District rule that includes emission limits based on best practices in other areas of the state.
WA-3	Green Waste Diversion	All Pollutants	Develop model policies to facilitate local adoption of ordinances and programs to reduce the amount of green waste going to landfill.
WA-4	Recycling & Waste Reduction	GHG	Develop or identify and promote model ordinances on community-wide zero waste goals and recycling of construction and demolition materials in commercial and public construction projects.

PROPOSED CONTROL MEASURES – BAAQMD 2016 Plan			
Control Measure Number	**Name**	**Pollutant**	**Implementation Actions**
Water			
WR-1	Limit GHGs from POTWs	GHG	Initiate a process to better understand and quantify GHG emissions at POTW facilities, including methane and nitrous oxide emissions. Consider new Air District rules to regulate GHG emissions from water treatment Plants.
WR-2	Support Water Conservation	GHG	Develop a list of best practices that reduce water consumption and increase on-site water recycling in new and existing buildings; incorporate into local Planning guidance.
Short-Lived Climate Pollutants			
SL-1	Short-Lived Climate Pollutants	GHG, PM	Reduce methane from landfills and farming activities through various control measures listed under waste and agriculture sectors. Develop a rule to reduce methane emissions from natural gas pipelines and processing operations, and amend regulations to reduce emissions of methane and other organic gases from equipment leaks at oil refineries. Enforce applicable regulations on the servicing of existing air conditioning units in motor vehicles, support the adoption of more stringent regulations by CARB and/or U.S. EPA, and encourage better HFC disposal practices.
SL-2	Guidance for Local Planners	GHG	Track progress in adoption and implementation of short-lived climate pollutants (SLCP) reduction measures in local Plans and programs
SL-3	GHG Monitoring and Emissions Measurement Network	GHG	Develop a GHG air monitoring Plan for the Bay Area that includes strategic selection of measurement locations, selection of relevant measurement technologies and procurement of appropriate GHG instrumentation, calibration gas standards and sampling logistics. Establish, operate and maintain the GHG air monitoring network. Collaborate with the scientific community to use different methods to estimate methane emissions in the Bay Area, create spatially resolved maps of methane emissions, and identify sectors and areas for focused measurement study.

In July 2013, Metropolitan Transportation Commission (MTC) and ABAG approved the region's Sustainable Communities Strategy and the 2040 Regional Transportation Plan in the Plan Bay Area Regional Transportation Plan and Sustainable Communities Strategy for the San Francisco Bay Area 2013 – 2040 (Plan Bay Area). Plan Bay Area is the region's first integrated long-range land use and transportation Plan. Plan Bay Area calls for focused housing and job growth around high-quality transit corridors, particularly within areas identified by local jurisdictions as Priority Development Areas (PDAs). This land use strategy is intended to enhance mobility and economic growth by linking housing/jobs with transit, thus offering a more efficient land use pattern around transit and a greater return on existing and planned transit investments. Plan Bay Area specifies the strategies and investments to maintain, manage, and improve the region's transportation network, which includes bicycle and pedestrian facilities, local streets and roads, public transit systems, and highways.

Plan Bay Area measures and recommendations have accordingly been moved forward for inclusion in the region's air quality plans and are included as part of the 2016 Plan, along with additional Transportation Control Measures (TCMs) proposed to be implemented by the Air District, local governments, and others. The impacts of implementation of the control measures approved in Plan Bay Area were evaluated in a separate CEQA document, the Draft Environmental Impact Report for the Plan Bay Area Strategy for a Sustainable Region (SCH No. 2012062029) (MTC, 2013). The Draft PEIR for the 2016 Plan will build on the environmental analyses in the MTC 2013 Final EIR for the evaluation of the environmental impacts of implementing the TCMs developed by MTC. Environmental impacts from implementing the TCMs proposed in the 2016 Plan will be addressed in the Draft PEIR for the 2016 Plan.

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CHAPTER 2

ENVIRONMENTAL CHECKLIST

Chapter 2

Environmental Checklist

INTRODUCTION

The environmental checklist provides a standard evaluation tool to identify a project's adverse environmental impacts. This checklist identifies and evaluates potential adverse environmental impacts that may be created by the proposed project.

GENERAL INFORMATION

Project Title:	Bay Area Air Quality Management District 2016 Clean Air Plan/Regional Climate Protection Strategy (2016 Plan)
Lead Agency Name:	Bay Area Air Quality Management District
Lead Agency Address:	San Francisco, California 94109
Contact Person:	Josh Pollak
Contact Phone Number:	415-749-8435
Project Location:	The 2016 Plan applies to the area within the jurisdiction of the Bay Area Air Quality Management District Air/District, which encompasses all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties.
Project Sponsor's Name:	Bay Area Air Quality Management District
Project Sponsor's Address:	375 Beale Street, Suite 600 San Francisco, California 94105
General Plan Designation:	The 2016 Plan applies to the area within the jurisdiction of the Bay Area Air Quality Management and would encompass all general plan designations within the Bay Area
Zoning:	The 2016 Plan applies to the area within the jurisdiction of the Bay Area Air Quality Management and would encompass all types of zoning within the Bay Area.
Description of Project:	See "Background" in Chapter 1.
Surrounding Land Uses and Setting:	See "Affected Area" in Chapter 1.
Other Public Agencies Whose Approval is Required:	California Air Resources Board

Environmental Factors Potentially Affected:

The following environmental impact areas have been assessed to determine their potential to be affected by the proposed project. As indicated by the checklist on the following pages, environmental topics marked with an "✓" may be adversely affected by the proposed project. An explanation relative to the determination of impacts can be found following the checklist for each area.

☐	Aesthetics	☐	Agriculture and Forestry Resources	☒	Air Quality
☐	Biological Resources	☐	Cultural Resources	☐	Geology / Soils
☒	Greenhouse Gas Emissions	☒	Hazards & Hazardous Materials	☒	Hydrology / Water Quality
☐	Land Use / Planning	☐	Mineral Resources	☒	Noise
☐	Population / Housing	☐	Public Services	☐	Recreation
☒	Transportation / Traffic	☒	Utilities / Service Systems	☒	Mandatory Findings of Significance

DETERMINATION

On the basis of this initial evaluation:

☐ I find the proposed project COULD NOT have a significant effect on the environment, and that a NEGATIVE DECLARATION will be prepared.

☐ I find that although the proposed project could have a significant effect on the environment, there will not be significant effects in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

☒ I find that the proposed project MAY have a significant effect on the environment, and an PROGRAM ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Josh Pollak 6/15/16

Signature: Date:

Josh Pollak 6/15/16

Printed Name: Date:

EVALUATION OF ENVIRONMENTAL IMPACTS:

1) A brief explanation is required for all answers except "No Impact" answers that are adequately supported by the information sources a lead agency cites in the parentheses following each question. A "No Impact" answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A "No Impact" answer should be explained where it is based on project-specific factors as well as general standards (e.g., the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis.

2) All answers must take account of the whole action involved, including off-site as well as on-site, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.

3) Once the lead agency has determined that a particular physical impact may occur, the checklist answers must indicate whether the impact is potentially significant, less than significant with mitigation, or less than significant. "Potentially Significant Impact" is appropriate if there is substantial evidence that an effect may be significant. If there are one or more "Potentially Significant Impact" entries when the determination is made, an EIR is required.

4) "Negative Declaration: Less Than Significant with Mitigation Incorporated" applies where the incorporation of mitigation measures has reduced an effect from "Potentially Significant Impact" to a "Less Than Significant Impact." The lead agency must describe the mitigation measures, and briefly explain how they reduce the effect to a less than significant level (mitigation measures from "Earlier Analyses," as described in (5) below, may be cross-referenced).

5) Earlier analyses may be used where, pursuant to the tiering, Program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or negative declaration. Section 15063 (c)(3)(D). In this case, a brief discussion should identify the following:

   a) Earlier Analysis Used. Identify and state where they are available for review.

   b) Impacts Adequately Addressed. Identify which effects from the above checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards, and state whether such effects were addressed by mitigation measures based on the earlier analysis.

   c) Mitigation Measures. For effects that are "Less than Significant with Mitigation Measures Incorporated," describe the mitigation measures which were incorporated or refined from the earlier document and the extent to which they address site-specific conditions for the project.

6) Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g., general plans, zoning ordinances). Reference to a previously prepared or outside document should, where appropriate, include a reference to the page or pages where the statement is substantiated.

7) Supporting Information Sources: A source list should be attached, and other sources used or individuals contacted should be cited in the discussion.

8) This checklist is only a suggested form, and lead agencies are free to use different formats; however, lead agencies should normally address the questions from this checklist that are relevant to a project's environmental effects in whatever format is selected.

9) The explanation of each issue should identify:

a) the significance criteria or threshold, if any, used to evaluate each question; and

b) the mitigation measure identified, if any, to reduce the impact to less than significance.

ENVIRONMENTAL CHECKLIST AND DISCUSSION

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less-than-Significant Impact	No Impact
I. AESTHETICS.				
Would the project:				
a) Have a substantial adverse effect on a scenic vista?	☐	☐	☑	☐
b) Substantially damage to scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings along a scenic highway?	☐	☐	☑	☐
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	☐	☐	☑	☐
d) Create a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area?	☐	☐	☑	☐

Setting

The Air District covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. The area of coverage is vast (about 5,600 square miles), so that land uses vary greatly and include commercial, industrial, residential, agricultural, and open space uses. Scenic highways or corridors are located throughout the Bay Area.

Significance Criteria

The proposed project impacts on aesthetics will be considered significant if:

- The project will block views from a scenic highway or corridor.
- The project will adversely affect the visual continuity of the surrounding area.
- The impacts on light and glare will be considered significant if the project adds lighting which would add glare to residential areas or sensitive receptors.

Impacts deemed potentially significant will be considered further in the Draft PEIR.

The 2016 Plan is designed to reduce emissions from existing emission sources and promote the lowest achievable emission rates from new emissions sources. The proposed control measures would affect existing commercial/industrial facilities; increase energy efficiency; establish specifications for coatings, fuels and mobile source exhaust emissions; minimize vehicle trips; accelerate the replacement of high-emitting mobile sources with zero or near zero-emitting mobile sources; establish greater control of industrial stationary sources; establish greater control of fugitive emissions; improve monitoring; and establish educational and outreach programs.

I. a, b, and c). Officially designated scenic highways in the Air District include State Highways 116 and 12 in Sonoma County; Interstate 680 and State Highway 24 in Contra Costa County; Interstate 80 and 680, and State Highway 84 in Alameda County; State Highway 9 in Santa Clara County; and Interstate 280 and State Highways 1, and 35 in San Mateo County. The proposed control measures in the 2016 Plan are not expected to adversely affect scenic vistas in the district; damage scenic resources, including but not limited to trees, rock outcroppings, or historic buildings within a scenic highway; or substantially degrade the visual character of a site or its surroundings. The reason for this conclusion is that most of the proposed control measures typically affect industrial, or commercial facilities located in appropriately zoned areas (e.g., industrial and commercial areas) that are not usually associated with scenic resources. Construction activities are expected to be limited to industrial and commercial areas. Further, modifications typically occur inside the buildings at the affected facilities, or because of the nature of the business (e.g., commercial or industrial) can easily blend with the facilities with little or no noticeable effect on adjacent areas.

For example, some of the control measures would require additional PM controls on fluid catalytic cracking units (SS-1), coke calcining facilities (SS-8), cement plants (SS-17), general PM emissions limits (SS-29), petroleum coke and coal storage and handling facilities, asphalt operations (SS-35), fugitive dust (SS-36), landfills (WA1), and wastewater treatment plants (WR-1). These control measures could lead to changes in operations or installation of air pollution control devices. While these control devices may be visible to surrounding areas, they would be used within the industrialized areas, which contain cement plants, refineries, and other existing industrial structures. Therefore, no significant adverse aesthetic impacts would be expected.

Some control measures would encourage the use of alternative energy sources which could result in the installation of solar panels to generate solar power. Solar panels would be expected to be installed on existing structures to supply electricity as an alternative energy source. Aesthetic impacts would not be expected for the installation of solar panels on new or existing buildings as local land use agencies have development standards in place to ensure significant adverse aesthetic impacts do not occur.

Cool roof, cool paving and parking lot tree shading could be included under the Urban Heat Island Measure (BL-4) and additional trees could be planted under Urban Tree Planting (NW-2). Trees have the potential to block desirable views as well as provide aesthetically pleasing impacts by screening undesirable views (e.g., freeways and streets). This control measure would likely be implemented through local ordinances or as mitigation under CEQA. Aesthetic impacts associated with trees can be handled on a case-by-case basis by developing appropriate planting locations and avoid impacting scenic vistas. The planting of trees in urban areas tend to provide aesthetically pleasing impacts.

Some control measures would attempt to influence land uses associated with new development to minimize air emissions, e.g., Land Use Strategies (TR-11), and Indirect Source Review (TR-17). Development itself has the potential for aesthetic impacts, however, the Indirect Source Control and Land Use Strategies could influence land uses, for example affecting the number of units, or encouraging bike lanes or pedestrian improvements, or require the payment of fees. However these measures are not expected to result in modifications to new development that would generate significant aesthetic impacts. The aesthetic impacts of new development will be evaluated on a case-by-case basis by the appropriate lead agency and are generally subject to CEQA requirements. Any potential impacts can be mitigated by the local land use agency using General Plan and CEQA guidance.

Control measures for ocean-going marine vessels could promote greater use of equipment at port facilities to control ship emissions from ships at berth. Such control devices may include hoods or bonnets on ship exhaust stacks to capture emissions and are expected to be at least as high as the ship stacks. While these control devices would be visible to surrounding areas, they would be similar to other structures used within the heavily industrialized portions of the ports, which contain terminals, tanks, ship-loading structures (including conveyors and cranes), and other similar structures. Therefore, such additional emission control equipment would not be expected to result in significant aesthetic impacts.

The 2016 Plan may have a beneficial effect on scenic resources by improving visibility as well as improving air quality.

I. d). The proposed 2016 Plan is not expected to create additional demand for new lighting which could create glare that could adversely affect day or nighttime views in any areas. Compliance with control measures may affect operations at industrial or commercial facilities, but is not expected to affect hours of operation. Further, many types of industrial or commercial facilities are already lighted at night for safety and security reasons. . As noted in item I. a) – c) above, facilities affected by proposed control measures typically make modifications in the interior of an affected facility so any new light sources would typically be inside a building or not noticeable because of the presence of existing outdoor light sources. Further, operators of commercial or industrial facilities who would make physical modifications to facilities and may require additional lighting would be located in appropriately zoned areas that are not usually located next to residential areas, so new light sources, if any, are not expected to be noticeable in residential or other sensitive areas.

Conclusion

Based upon the above considerations, significant adverse project-specific aesthetic impacts are not expected to occur due to implementation of the 2016 Plan and, therefore, will not be further evaluated in the Draft PEIR.

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
II. AGRICULTURE and FORESTRY RESOURCES.				
In determining whether impacts on agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☑
b) Conflict with existing zoning for agricultural use or conflict with a Williamson Act contract?	☐	☐	☐	☑
c) Conflict with existing zoning for, or cause rezoning of, forest land as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?				
d) Result in the loss of forest land or conversion of forest land to non-forest use?				
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☐	☑

Setting

The Air District covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. The area of coverage is vast (about 5,600 square miles) so that land uses vary greatly and include commercial, industrial, residential, agricultural, and open space uses. Some of these agricultural lands are under Williamson Act contracts.

Significance Criteria

The proposed project impacts will be considered significant if:

- The proposed project conflicts with existing zoning or agricultural use or Williamson Act contracts.
- The proposed project will convert prime farmland, unique farmland or farmland of statewide importance as shown on the maps prepared pursuant to the farmland mapping and monitoring program of the California Resources Agency, to non-agricultural use.
- The proposed project conflicts with existing zoning for, or causes rezoning of, forest land (as defined in Public Resources Code §12220(g)), timberland (as defined in Public Resources Code §4526), or timberland zoned Timberland Production (as defined by Government Code § 51104 (g)).
- Result in the loss of forest land or conversion of forest land to non-forest use.
- The proposed project would involve changes in the existing environment, which due to their location or nature, could result in conversion of farmland to non-agricultural use or conversion of forest land to non-forest use.

Discussion of Impacts

The 2016 Plan is designed to reduce emissions from existing emission sources and promote the lowest achievable emission rates from new emissions sources. The proposed control measures would affect existing commercial/industrial facilities; increase energy efficiency; establish specifications for coatings, fuels and mobile source exhaust emissions; minimize vehicle trips; accelerate the replacement of high-emitting mobile sources with zero or near zero-emitting mobile sources; establish greater control of industrial stationary sources; establish greater control of fugitive emissions; improve monitoring; and establish educational and outreach programs.

II. a, b, c, d, and e). The 2016 Plan control measures typically affect existing commercial or industrial facilities, reduce emissions from mobile sources, and reduce emissions from land use decisions. The control measures are not expected to generate any new construction of buildings or other structures that would require conversion of farmland to non-agricultural use or conflict with zoning for agricultural uses or a Williamson Act contract. There are no provisions in the proposed 2016 Plan that would affect or conflict with existing land use plans, policies, or regulations or require conversion of farmland to non-agricultural uses. Some control measures could impact agricultural facilities and farmers by controlling emissions from freight and farming equipment (TR-24), providing incentives for installation of digesters, and reducing emissions from livestock wastes (AG-4). However, these control measures are not expected to convert agricultural land uses to non-agricultural land uses. Land use, including agriculture-related uses, and other planning considerations are determined by local governments and no agricultural land use or planning requirements will be altered by the proposed project. The 2016 Plan could provide benefits to agricultural resources by reducing air pollutants, including ozone precursors and greenhouse gases, thus, reducing the adverse impacts of ozone on plants and animals.

Some control measures would attempt to influence land uses associated with new development to minimize air emissions, e.g., and Indirect Source Review (TR-16). Development itself has the potential for impacts to agricultural resources, however, the Indirect Source Review Control Measure could set air quality performance standards for new and modified development projects. Therefore, the Indirect Source Control Measure is not expected to result in modifications to new development that would generate significant impacts on agricultural resources or encourage the development of existing agricultural lands. As a result, control measures in the 2016 Plan are not expected to adversely affect local land use policies or result in the conversion of agricultural lands to non-agricultural land uses.

The primarily affected facilities associated with the 2016 Plan are located in industrial areas where agricultural or forest resources are generally not located. No substantial construction activities are expected to result from implantation of the 2016 Plan. Several control measures could require air pollution control equipment on equipment at various industrial or commercial sources or changes in operations at these facilities. Construction activities may be associated with the installation of pollution control equipment. Such construction activities are expected to be limited to the existing industrial and commercial facilities. No agricultural or forest resources are located within the boundaries of the existing industrial and commercial facilities, and construction activities would not convert any agricultural or forest land into non-agricultural or non-forest use, or involve Williamson Act contracts.

Conclusion

Based upon the above considerations, significant adverse project-specific impacts to agricultural resources are not expected to occur due to implementation of the 2016 Plan and, therefore, will not be further analyzed in the Draft PEIR.

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
III. AIR QUALITY.				
Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☐	☑
b) Violate any air quality standard or contribute to an existing or projected air quality violation?	☑	☐	☐	☐
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is a nonattainment area for an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors)?	☑	☐	☐	☐
d) Expose sensitive receptors to substantial pollutant concentrations?	☑	☐	☐	☐
e) Create objectionable odors affecting a substantial number of people?	☐	☐	☑	☐

Setting

It is the responsibility of the Air District to ensure that state and federal ambient air quality standards are achieved and maintained in its geographical jurisdiction. Health-based air quality standards have been established by California and the federal government for the following criteria air pollutants: ozone, carbon monoxide (CO), nitrogen dioxide (NO_2), particulate matter less than 10 microns in diameter (PM_{10}), particulate matter less than 2.5 microns in diameter ($PM_{2.5}$), sulfur dioxide (SO_2), and lead.

Air quality conditions in the San Francisco Bay Area have improved since the Air District was created in 1955. Ambient concentrations of air pollutants and the number of days on which the region exceeds air quality standards have fallen substantially. The Air District is in attainment of the State and federal ambient air quality standards for CO, NO_2, and SO_2 and the federal standards for $PM_{2.5}$. The Air District is not in attainment with the State PM_{10} and $PM_{2.5}$ standards. The Bay Area is also designated as non-attainment for the federal 8-hour and California 1- and 8-hour ozone standards.

Significance Criteria

The threshold of significance that the Air District will use to evaluate potential impacts on regional air quality challenges such as ozone (smog) will be "no net increase" in regional emissions of pollutants that contribute to these challenges as a result of the control strategy in the 2016 Plan. These pollutants include the criteria pollutants for which National Ambient Air Quality Standards (NAAQS) have been established. If the control strategy will result in a net reduction in regional emissions of these pollutants, it will have no impact on regional air quality challenges. If it will result in a net increase in regional emissions, the Air District would consider that to constitute a significant adverse impact on air quality.

In addition, the Air District will also (to the extent feasible) evaluate whether the control strategy in the 2016 Plan could have the potential to create localized air quality impacts that could be significant. This outcome could occur if the control strategy results in an increase in emissions in one specific area that causes or significantly contributes to a hazard to public health or the environment, even if there is no net increase in emissions regionally. For criteria pollutants, the threshold of significance the Air District will use will be whether the control strategy will result in a localized "hot spot" in which ambient concentrations of the pollutant exceed an established ambient air quality standard. For toxic air contaminants (TACs), the Air District will use two thresholds of significance, one for carcinogenic health impacts and one for non-carcinogenic health impacts. For non-carcinogenic impacts, the Air District will use a "Hazard Index" of 1 as the threshold of significance. A Hazard Index of 1 is the level of exposure below which there are not expected to be any observable adverse health effects, based on scientific studies. If the control strategy will result in localized concentrations of TACs that will expose people to a Hazard Index greater than 1, that will be considered a significant impact.[1] For carcinogenic impacts, the Air District will use a threshold of "100 in one million" increased risk from all emissions sources within 1,000 feet. This means an exposure level that would be expected to produce 100 additional cancer cases if a population of one million people were exposed to that level of exposure over a 70-year lifetime. Under this threshold, there will be a significant localized impact if any person will be subjected to an additional carcinogenic risk of 100 in one million, taking into account all of the net increases in TAC emissions that will occur as a result of the control strategy within 1000 feet of the person.

With respect to potential odor impacts, the Air District will consider an impact to be significant if there will be a substantial number of odor complaints from members of the public.

[1] There are two types of non-carcinogenic toxic risk, "acute" risk and "chronic" risk. Acute risk relates to short-term exposures, whereas chronic risk relates to exposures over a longer time frame (typically a 70-year lifetime). The Air District will use a Hazard Index of 1 for evaluating both types of non-carcinogenic health risk.

Discussion of Impacts

The 2016 Plan is designed to reduce emissions from existing emission sources and promote the lowest achievable emission rates from new emissions sources. The proposed control measures would affect existing commercial/industrial facilities; increase energy efficiency; establish specifications for coatings, fuels and mobile source exhaust emissions; minimize vehicle trips; accelerate the replacement of high-emitting mobile sources with zero or near zero-emitting mobile sources; establish greater control of industrial stationary sources; establish greater control of fugitive emissions; improve monitoring; and establish educational and outreach programs. All of these measures are designed to reduce emissions throughout the San Francisco Bay Area in order to improve air quality and public health.

It is possible, however, that some of these measures could have ancillary adverse impacts that could result in certain amounts of increased emissions of air pollutants, which would offset the emission reductions resulting from the Plan to a certain extent. For example, implementation of some of the control measures could involve retrofitting, replacing, or installing new air pollution control equipment, changes in product formulations, or construction of transportation infrastructure that have the potential to create secondary air quality impacts. Emissions from one pollutant may increase slightly in order to effectively reduce overall emissions and protect public health.

The PEIR will evaluate the overall air quality impacts of the emission reductions that the Plan will generate, as well as any ancillary emissions increases that may result. The PEIR will quantify such impacts to the extent feasible, and will discuss the nature of such impacts qualitatively. The PEIR will apply the significance thresholds outlined above to the nature and extent of the air quality impacts that will result from the Plan in order to determine whether there will be any significant air quality impacts.

The PEIR will address the specific issues related to air quality impacts outlined in the checklist at the beginning of this section as follows.

III. a). The proposed project is an update of the Air District's 2010 Clean Air Plan (CAP), which is required pursuant to state law. By revising and updating emission inventories and control strategies, the Air District is complying with state law, and furthering development and implementation of control measures, which are expected to reduce emissions and make progress towards attaining and maintaining state and federal ambient air quality standards for ozone and particulate matter in the District. The 2016 Plan will also implement control measures to reduce toxic air contaminants and greenhouse gases. The 2016 Plan will update and replace the 2010 CAP as the air quality plan for the Bay Area. Since the 2016 Plan will be the applicable air quality plan for the Bay Area, by definition it will not conflict with or obstruct the implementation of the applicable air quality plan. Therefore, no significant impact is expected and this topic will not be further evaluated in the PEIR.

III. b), c), d): The 2016 Plan is designed and intended to obtain new or further emissions reductions from both stationary and mobile sources. The PEIR will evaluate whether any potential ancillary adverse air quality impacts would offset the emission reductions resulting from the Plan such that there could be any significant adverse air quality impacts under the significance criteria outlined above. This analysis will evaluate the potential for significant cumulative regional and local air quality impacts, either through net increases in emissions region-wide or through local increases in emissions that result in significant localized impacts. The analysis will evaluate the potential for the Plan to cause or contribute to any violations of any applicable air quality standards or to expose sensitive receptors to substantial concentrations of TACs or other pollutants that could cause a significant public health risk.

III. e): Some 2016 Plan control measures may require construction activities. Odors are sometimes associated with the exhaust from diesel-fueled equipment. However, odor impacts from construction equipment are not expected to be significant because most diesel-fueled equipment are mobile and do not remain in one location that could continuously affect offsite receptors. In addition, diesel exhaust is generally hot and, therefore, buoyant, which results in dilution of potential odor impacts as the exhaust rises into the atmosphere. As a result, odor impacts from construction activities to implement control measures are not expected to be significant and will not be further discussed in the PEIR.

In some cases, reformulated products have noticeable odors; however, it is typically the case that reformulated products have less noticeable odors than the products they are replacing. Reformulated products tend to have reduced VOC content and reduced emissions and, therefore, lower potential for creating odor impacts. As a result, significant adverse odor impacts have not been associated with reformulated products, especially those relying on water-based formulations, compared to conventional high-VOC products. Modifications to industrial facilities to produce reformulated products (e.g., refineries) also have the potential to create odor impacts. However, owners/operators of industries affected by control measures in the proposed 2016 Plan would be subject to existing air quality rules and regulations, which prohibits creating odor nuisances. For these reasons, implementing the 2016 Plan is not expected to create significant adverse odor impacts and, therefore, will not be further addressed in the Draft PEIR.

Conclusion

Based upon the above considerations, it is possible that there could potentially be significant adverse air quality impacts due to implementation of proposed 2016 Plan. The PEIR will therefore evaluate the potential for any such significant adverse impacts.

		Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
IV.	**BIOLOGICAL RESOURCES.** Would the project:				
a)	Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	☐	☐	☐	☑
b)	Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	☐	☐	☐	☑
c)	Have a substantial adverse effect on federally protected wetlands as defined by §404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal wetlands, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☐	☑
d)	Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☐	☑
e)	Conflicting with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	☑
f)	Conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☑

Setting

The Air District boundary covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. The area of coverage is vast (about 5,600 square miles) so that land uses vary greatly and include commercial, industrial, residential, agricultural, and open space uses. A wide variety of biological resources are located within the Bay Area.

The entire area under the jurisdiction of the Air District is affected by the proposed project, and is located within the Bay Area-Delta Bioregion (as defined by the State's Natural Communities Conservation Program). This Bioregion is comprised of a variety of natural communities, which range from salt marshes to chaparral to oak woodland. A majority of the affected areas have been graded to develop various commercial or residential structures. Native vegetation, other than landscape vegetation, has generally been removed from areas to minimize safety and fire hazards. Any new development would fall under the requirements of the City or County General Plans.

Significance Criteria

The proposed project impacts on biological resources will be considered significant if:

- The project results in a loss of plant communities or animal habitat considered to be rare, threatened or endangered by federal, state or local agencies.
- The project interferes substantially with the movement of any resident or migratory wildlife species.
- The project adversely affects aquatic communities through construction or operation of the project.

Discussion of Impacts

The 2016 Plan is designed to reduce emissions from existing emission sources and promote the lowest achievable emission rates from new emissions sources. The proposed control measures would affect existing commercial/industrial facilities; increase energy efficiency; establish specifications for coatings, fuels and mobile source exhaust emissions; minimize vehicle trips; accelerate the replacement of high-emitting mobile sources with zero or near zero-emitting mobile sources; establish greater control of industrial stationary sources; establish greater control of fugitive emissions; improve monitoring; and establish educational and outreach programs.

IV. a), b, and d). No direct or indirect impacts from implementing 2016 Plan control measures were identified that could adversely affect plant and/or animal species in the Air District boundaries. 2016 Plan control measures typically affect existing commercial or industrial facilities, reduce emissions from mobile sources, increase energy efficiency, as well as measures to minimize emissions from indirect sources. Existing commercial or industrial facilities are generally located in appropriately zoned commercial or industrial areas, which typically do not support candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service.

Similarly, modifications at existing facilities would not interfere substantially with the movement of any native resident or migratory fish or wildlife species or with native or resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites. Further, since the proposed 2016 Plan primarily regulates stationary emission sources at existing commercial or industrial facilities, it does not directly or indirectly affect land use policy that may adversely affect riparian habitat or other sensitive natural communities identified in local or regional plans, policies, or regulations, or identified by the California Department of Fish and Game or U.S. Fish and Wildlife Service. Improving air quality is expected to provide health and welfare benefits to plant and animal species in the Bay Area. There are no control measures contained in the 2016 Plan that would alter this determination.

IV. c). As noted in the previous item, promulgating control measures in the 2016 Plan may require modifications at existing industrial or commercial facilities to control or further control emissions, reduce mobile sources, increase energy efficiency, and reduce emissions from land use decisions. Some control measures could result in the installation of additional controls at industrial or commercial facilities. The installation of air pollution control equipment at these facilities would be consistent with commercial/industrial land uses. For these reasons the proposed project will not adversely affect protected wetlands as defined by §404 of the Clean Water Act, including, but not limited to marshes, vernal pools, coastal wetlands, etc., through direct removal, filling, hydrological interruption or other means.

IV. e and f). Implementing the proposed 2016 Plan is not expected to affect land use plans, local policies or ordinances, or regulations protecting biological resources such as a tree preservation policy or ordinance for the reasons already given, i.e. control measures promulgated as rules or regulations primarily affect existing facilities located in appropriately zoned areas, reduce emissions from mobile sources, and reduce emissions from land use decisions. Land use and other planning considerations are determined by local governments and land use or planning requirements are not expected to be altered by the proposed project. Similarly, the proposed 2016 Plan is not expected to affect in any way habitat conservation or natural community conservation plans, agricultural resources or operations, and would not create divisions in any existing communities.

The Indirect Source Review Control Measure (TR-16) would attempt to influence land uses associated with new development to minimize air emissions. Development itself has the potential for biological impacts, however, the Indirect Source Review Control Measure could sets air quality performance standards for new and modified development projects. Therefore, the Indirect Source Review Control Measure is not expected to result in modifications to new development that would generate significant biological impacts. The biological impacts of new development will be evaluated on a case-by-case basis and are generally subject to CEQA requirements and can be mitigated by the local land use agency using General Plan and habitat conservation guidance.

The 2016 Plan includes the Urban Heat Island Measure (BL-4) and Urban Tree Planting (NW-2) that would encourage additional tree planting. The trees are expected to be planted in urban areas as part of landscaped vegetation and are not expected to displace any native habitat or conflict with local policies. Rather the control measure is expected to encourage local tree policies to include the use of additional trees to provide landscaping that shades urban development, resulting in cooler temperatures and less energy used for cooling.

Carbon Sequestration in Wetlands (NW-3) is expected to help preserve and restore wetlands that have been destroyed or degraded throughout the San Francisco Bay. Reestablishing extensive areas of tidal marsh would have major environmental benefits, including improving the Bay's natural filtering system and enhancing water quality, increasing primary productivity of the aquatic ecosystem, and reducing the need for flood control and channel dredging. Therefore, control measure NW-3 is expected to provide beneficial impacts to biological resources within the wetlands. Further, improving air quality is expected to provide health and welfare benefits to plant and animal species in the district.

Conclusion

Based upon the above considerations, significant adverse project-specific biological resources impacts are not expected to occur due to implementation of the 2016 Plan and, therefore, will not be further evaluated in the Draft PEIR.

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
V. CULTURAL RESOURCES. Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	☐	☐	☑	☐
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☐	☐	☑	☐
c) Directly of indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☑	☐
d) Disturb any human remains, including those interred outside of formal cemeteries?	☐	☐	☑	☐

Setting

The Air District covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties.

The area of coverage is vast (about 5,600 square miles) so that land uses vary greatly and include commercial, industrial, residential, agricultural and open space uses. Cultural resources are defined as buildings, sites, structures, or objects which might have historical architectural, archaeological, cultural, or scientific importance.

The Carquinez Strait represents the entry point for the Sacramento and San Joaquin Rivers into the San Francisco Bay. This locality lies within the San Francisco Bay and the west end of the Central Valley archaeological regions, both of which contain a rich array of prehistoric and historical cultural resources. The areas surrounding the Carquinez Strait and Suisun Bay have been occupied for millennia given their abundant combination of littoral and oak woodland resources.

Significance Criteria

The proposed project impacts to cultural resources will be considered significant if:

- The project results in the disturbance of a significant prehistoric or historic archaeological site or a property of historic or cultural significance to a community or ethnic or social group.
- Unique paleontological resources are present that could be disturbed by construction of the proposed project.
- The project would disturb human remains.

Discussion of Impacts

The 2016 Plan is designed to reduce emissions from existing emission sources and promote the lowest achievable emission rates from new emissions sources. The proposed control measures would affect existing commercial/industrial facilities; increase energy efficiency; establish specifications for coatings, fuels and mobile source exhaust emissions; minimize vehicle trips; accelerate the replacement of high-emitting mobile sources with zero or near zero-emitting mobile sources; establish greater control of industrial stationary sources; establish greater control of fugitive emissions; improve monitoring; and establish educational and outreach programs.

V. a, b, c and d). All control measures in the 2016 Plan were evaluated to identify those control measures with potential cultural resources impacts. No control measures were identified that could generate significant adverse cultural resources impacts. CEQA Guidelines state that “generally, a resource shall be considered ‘historically significant’ if the resource meets the criteria for listing in the California Register of Historical Resources including the following:

A. Is associated with events that have made a significant contribution to the broad patterns of California’s history and cultural heritage;

B. Is associated with the lives of persons important in our past;

C. Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values;

D. Has yielded or may be likely to yield information important in prehistory or history" (CEQA Guidelines §15064.5).

Generally, resources (buildings, structures, equipment) that are less than 50 years old are excluded from listing in the National Register of Historic Places unless they can be shown to be exceptionally important. Implementing the proposed 2016 Plan is primarily expected to result in controlling stationary source emissions at existing commercial or industrial facilities, reducing emissions from mobile sources, and reducing emissions from land use decisions. Some affected facilities, e.g., refineries, may have equipment older than 50 years that may need to be modified to comply with 2016 Plan control measures. However, such equipment does not typically meet the criteria identified in CEQA Guidelines §15064.5(a)(3). Affected facilities where physical modifications may occur are typically located in appropriately zoned commercial or industrial areas that have previously been disturbed. Because potentially affected facilities are existing facilities and controlling stationary source emissions does not typically require extensive cut-and-fill activities or excavation, it is unlikely that implementing control measures in the proposed 2016 Plan will: adversely affect historical or archaeological resources as defined in CEQA Guidelines §15064.5, destroy unique paleontological resources or unique geologic features, or disturb human remains interred outside formal cemeteries.

Implementing control measures in the proposed 2016 Plan may require site preparation and grading at an affected facility. Under this circumstance, it is possible that archaeological or paleontological resources could be uncovered. Even if this circumstance were to occur, significant adverse cultural resources impacts are not anticipated because there are existing laws in place that are designed to protect and mitigate potential adverse impacts to cultural resources. As with any construction activity, should archaeological resources be found during construction that results from implementing the proposed control measures, the activity would cease until a thorough archaeological assessment is conducted.

The Indirect Source Review and Land Use Strategies Control Measures in the 2016 Plan may require emission reductions from new or redevelopment land use projects (TR-16 and TR-10). These control measures, however, do not initiate or promote land use projects, they may simply require emission reductions after the decision has already been made to pursue new or redevelopment projects. As a result, Indirect Source Review and Land Use Strategies Control Measures are not expected to adversely affect local land use policies or create additional development that would impact cultural resources.

Conclusion

Based upon the above considerations, significant adverse project-specific cultural resources impacts are not expected to occur due to implementation of the 2016 Plan and, therefore, will not be further evaluated in the Draft PEIR.

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
VI. GEOLOGY AND SOILS.				
Would the project:				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☑	☐
ii) Strong seismic ground shaking?	☐	☐	☑	☐
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☑	☐
iv) Landslides?	☐	☐	☑	☐
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☑	☐
c) Be located on a geologic unit or soil that is unstable or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	☑	☐
d) Be located on expansive soil, as defined in Table 18-1-B of the California Building Code (1994) (formerly referred to as the Uniform Building Code), creating substantial risks to life or property?	☐	☐	☐	☑
e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems in areas where sewers are not available for the disposal of wastewater?	☐	☐	☐	☑

Setting

The Bay Area is located in the natural region of California known as the Coast Ranges geomorphic province. The province is characterized by a series of northwest trending ridges and valleys controlled by tectonic folding and faulting, examples of which include the Suisun Bay, East Bay Hills, Briones Hills, Vaca Mountains, Napa Valley, and Diablo Ranges.

Regional basement rocks consist of the highly deformed Great Valley Sequence, which include massive beds of sandstone inter-fingered with siltstone and shale. Unconsolidated alluvial deposits, artificial fill, and estuarine deposits, (including Bay Mud) underlie the low-lying region along the margins of the Carquinez Straight and Suisun Bay. The estuarine sediments found along the shorelines of Solano County are soft, water-saturated mud, peat and loose sands. The organic, soft, clay-rich sediments along the San Francisco and San Pablo Bays are referred to locally as Bay Mud and can present a variety of engineering challenges due to inherent low strength, compressibility and saturated conditions. Landslides in the region occur in weak, easily weathered bedrock on relatively steep slopes.

The San Francisco Bay Area is a seismically active region, which is situated on a plate boundary marked by the San Andreas Fault System. Several northwest trending active and potentially active faults are included with this fault system. Under the Alquist-Priolo Earthquake Fault Zoning Act, Earthquake Fault Zones were established by the California Division of Mines and Geology along "active" faults, or faults along which surface rupture occurred in Holocene time (the last 11,000 years). In the Bay area, these faults include the San Andreas, Hayward, Rodgers Creek-Healdsburg, Concord-Green Valley, Greenville-Marsh Creek, Seal Cove/San Gregorio and West Napa faults. Other smaller faults in the region classified as potentially active include the Southampton and Franklin faults.

Ground movement intensity during an earthquake can vary depending on the overall magnitude, distance to the fault, focus of earthquake energy, and type of geological material. Areas that are underlain by bedrock tend to experience less ground shaking than those underlain by unconsolidated sediments such as artificial fill. Earthquake ground shaking may have secondary effects on certain foundation materials, including liquefaction, seismically induced settlement, and lateral spreading.

Significance Criteria

The proposed project impacts on the geological environment will be considered significant if:

- Topographic alterations would result in significant changes, disruptions, displacement, excavation, compaction or over covering of large amounts of soil.
- Unique geological resources (paleontological resources or unique outcrops) are present that could be disturbed by the construction of the proposed project.
- Exposure of people or structures to major geologic hazards such as earthquake surface rupture, ground shaking, liquefaction or landslides.

- Secondary seismic effects could occur which could damage facility structures, e.g., liquefaction.
- Other geological hazards exist which could adversely affect the facility, e.g., landslides, mudslides.

Discussion of Impacts

The 2016 Plan is designed to reduce emissions from existing emission sources and promote the lowest achievable emission rates from new emissions sources. The proposed control measures would affect existing commercial/industrial facilities; increase energy efficiency; establish specifications for coatings, fuels and mobile source exhaust emissions; minimize vehicle trips; accelerate the replacement of high-emitting mobile sources with zero or near zero-emitting mobile sources; establish greater control of industrial stationary sources; establish greater control of fugitive emissions; improve monitoring; and establish educational and outreach programs.

VI. a, c, and d). The proposed 2016 Plan will not directly or indirectly expose people or structures to earthquake faults, seismic shaking, seismic-related ground failure including liquefaction, landslides, mudslides or substantial soil erosion for the following reasons. When implemented as rules or regulations, control measures do not directly or indirectly result in construction of new structures. Some structural modifications, however, at existing affected facilities may occur as a result of installing control equipment or making process modifications. In any event, existing affected facilities or modifications to existing facilities would be required to comply with relevant California Building Code requirements in effect at the time of initial construction or modification of a structure.

New structures, including new transportation infrastructure, must be designed to comply with the California Building Code requirements since the district is located in a seismically active area. The local cities or counties are responsible for assuring that projects comply with the California Building Code as part of the issuance of the building permits and can conduct inspections to ensure compliance. The California Building Code is considered to be a standard safeguard against major structural failures and loss of life. The code requires structures that will: 1) resist minor earthquakes without damage; 2) resist moderate earthquakes without structural damage but with some non-structural damage; and 3) resist major earthquakes without collapse but with some structural and non-structural damage

The California Building Code bases seismic design on minimum lateral seismic forces ("ground shaking"). The California Building Code requirements operate on the principle that providing appropriate foundations, among other aspects, helps to protect buildings from failure during earthquakes. The basic formulas used for the Uniform Building Code seismic design require determination of the seismic zone and site coefficient, which represents the foundation conditions at the site. Accordingly, buildings and equipment at existing affected facilities would conform to the California Building Code and other applicable state codes in effect at the time they were constructed.

Any potentially affected facilities that are located in areas where there has been historic occurrence of liquefaction, e.g., coastal zones, or existing conditions indicate a potential for liquefaction, including expansive or unconsolidated granular soils and a high water table, may have the potential for liquefaction-induced impacts at the project sites. The California Building Code requirements consider liquefaction potential and establish more stringent requirements for building foundations in areas potentially subject to liquefaction. Compliance with the California Building Code requirements is expected to minimize the potential impacts associated with liquefaction. The issuance of building permits from the local cities or counties will assure compliance with the California Building Code requirements. Finally, no proposed control measures would require the location of new, or relocation of existing facilities in areas prone to liquefaction. Land use decisions are under the authority of the local jurisdictions, typically cities or counties. Neither the Air District nor CARB has authority over land use decisions except to impose specific air pollution control requirements, which do not drive the land use approval process, and CEQA does not grant an agency new powers independent of the powers granted to the agency by other laws (CEQA Guidelines §15040(b)). Therefore, no significant impacts from liquefaction are expected and this potential impact will not be considered further.

Because facilities affected by any 2016 Plan control measures are typically located in industrial or commercial or already developed areas, which are not typically located near known geological hazards (e.g., landslide, mudflow, seische, tsunami or volcanic hazards), no significant adverse geological impacts are expected. Even if potentially affected facilities are located near such geological hazards, the hazards are part of the existing setting and are not made worse by installing control equipment or other activities to comply with emission control rules and regulations. The proposed control measures would not increase potential exposures to geologic hazards. Tsunamis at the facilities near the water or within the ports are not expected because the San Francisco Bay is largely protected from wave action. 2016 Plan control measures will not increase potential exposures to tsunamis. As a result, these topics will not be further evaluated in the Draft PEIR.

2016 Plan control measures affecting mobile sources, such as those that would accelerate the penetration of zero or low emission vehicles, would not affect geology or soils because on-road vehicles would continue to operate on existing roadways. Although some control measures would accelerate the penetration of zero or low emission off-road equipment, replacing one type of off-road engine with a lower emitting off-road engine would not be expected to affect construction activities as construction activities would occur for reasons other than complying with the 2016 Plan control measures.

VI. b). Although the proposed 2016 Plan control measures may require modifications at existing industrial or commercial facilities, such modifications are not expected to require substantial grading, construction activities, or paving of unpaved areas. The proposed project does not have the potential to substantially increase the area subject to compaction or over-covering since the subject areas would be limited in size and, typically, have already been graded or displaced in some way (e.g., additional structures at industrial or commercial areas). Therefore, significant adverse soil erosion impacts are not anticipated from implementing the 2016 Plan and will not be further analyzed in the Draft PEIR.

VI. e). Septic tanks or other similar alternative wastewater disposal systems are typically associated with small residential projects in remote areas. The proposed 2016 Plan does not contain any control measures that generate construction of residential projects in remote areas. The proposed control measures typically affect existing industrial or commercial facilities that are already hooked up to appropriate sewerage facilities. Based on these considerations, the use of septic tanks or other alternative wastewater disposal systems will not be further evaluated in the Draft PEIR.

Conclusion

Based upon the above considerations, significant adverse project-specific impacts to geology and soils are not expected to occur due to implementation of the 2016 Plan and, therefore, will not be further evaluated in the Draft PEIR.

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
VII. GREENHOUSE GAS EMISSIONS.				
Would the project:				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☑	☐	☐	☐
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☐	☑

Setting

Global climate change refers to changes in average climatic conditions on the earth as a whole, including temperature, wind patterns, precipitation and storms. Global warming, a related concept, is the observed increase in the average temperature of the earth's surface and atmosphere. One identified cause of global warming is an increase of greenhouse gases (GHGs) in the atmosphere. The six major GHGs identified by the Kyoto Protocol are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), sulfur hexafluoride (SF_6), haloalkanes (HFCs), and perfluorocarbons (PFCs). The GHGs absorb longwave radiant energy reflected by the earth, which warms the atmosphere. GHGs also radiate longwave radiation both upward to space and back down toward the surface of the earth. The downward part of this longwave radiation absorbed by the atmosphere is known as the "greenhouse effect." Some studies indicate that the potential effects of global climate change may include rising surface temperatures, increased frequency and intensity of forest fires, loss in snow pack, sea level rise, more extreme heat days per year, and more drought years.

Events and activities, such as the industrial revolution and the increased combustion of fossil fuels (e.g., gasoline, diesel, coal, etc.), have heavily contributed to the increase in atmospheric levels of GHGs. Approximately 80 percent of GHG emissions in California are from fossil fuel combustion and over 70 percent of GHG emissions are carbon dioxide emissions (Air District, 2010).

Significance Criteria

The threshold of significance that the Air District will use to evaluate potential climate change impacts from GHGs will be "no net increase" in GHG emissions as a result of the control strategy in the 2016 Plan. If the control strategy will result in a reduction in the Bay Area's GHG emissions, it will have no adverse impact on global climate change. If it will result in a net increase in GHG emissions, the Air District would consider that to be a significant adverse impact on climate change.

Discussion of Impacts

The 2016 Plan is designed to reduce GHG emissions from existing emission sources and promote the lowest achievable emission rates from new emissions sources. The proposed control measures would decrease energy demand and decarbonize energy; reduce vehicle trips; accelerate the replacement of high-emitting mobile sources with zero or near zero-emitting mobile sources; establish greater control of industrial GHG emissions; establish greater control of fugitive methane emissions; improve GHG air monitoring; and establish educational and outreach programs. All of these measures are designed to reduce GHG emissions throughout the San Francisco Bay Area in order to help address global climate change.

It is possible, however, that some of the control measures in the 2016 Plan could have ancillary increases in GHG emissions, which could offset some of the GHG emission reductions resulting from the Plan to a certain extent. For example, implementation of control measures that accelerate zero-emission technologies, rely on electricity; an increase in electrical demand may result in increased electricity generation and subsequently increased GHG emissions associated with combustion and power plants. GHG emissions may increase slightly from one emission sector as a result of these measures in order to effectively reduce overall GHG emissions from fossil fuel combustion and protect public health through the 2016 Plan.

The PEIR will evaluate the overall increase or decrease in GHG emissions as a result of the 2016 Plan. The PEIR will quantify the expected net increases and decreases to the extent feasible, as well as discuss the nature of such increases and decreases qualitatively. Based on this analysis, the PEIR will evaluate whether there will be an any net increase in GHG emissions as a result of the Plan, which would constitute a significant climate impact. If there is no net increase, there will be no adverse climate impact from the Plan.

The PEIR will address the specific issues related to GHG emissions outlined in the checklist at the beginning of this section as follows.

VII. a). The 2016 Plan includes control measures that specifically address GHG emissions and aim at reducing GHG emissions (SS-13, SS-14, SS-15, SS-16, AG-1, AG-2, AG-3, AG-4, NW-1, NW-2, NW-3, WA-1, WA-2, WA-3, WA-4, WR-1, SL-1, SL-2 and SL-3). Some control measures may have the potential to generate combustion emissions that could increase GHG emissions, however. The PEIR will evaluate all GHG emission reductions expected to result from the 2016, as well as any offsetting increases, to determine whether there will be any net increase in GHG emissions from the Plan as a whole.

VII. b). The control measures of the 2016 Plan will support and help implement State, regional and local plans that have been developed to reduce GHG emissions. These include the State's Scoping Plan, Plan Bay Area, local general plans and climate actions plans. The 2016 Plan control measures encourage shifting modes of transportation to increase transit, walking or bicycling by supporting land use development patterns that include more mixed use high density transit oriented projects. This focus is consistent with the Scoping Plan, Plan Bay Area and other local land use plans to reduce GHG emissions from the transportation and building sectors. Other control measures in the 2016 Plan will directly support and State, regional and local climate action plans by identifying strategies to reduce GHG emissions from solid waste, water use, agriculture, energy, and existing buildings, which are common sources of GHG emissions in most local jurisdictions. Therefore, this topic is less than significant and will not be further evaluated in the Draft PEIR.

Conclusion

The 2016 Plan could potentially have significant adverse impacts on climate change as a result of GHG emissions if the net effect of the Plan's control measures is to increase GHG emissions from the Bay Area. The PEIR will therefore evaluate whether there will be any net increase in GHG emissions as a result of the 2016 Plan.

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
VIII. HAZARDS AND HAZARDOUS MATERIALS. Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☑	☐	☐	☐
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset	☑	☐	☐	☐

	and accident conditions involving the release of hazardous materials into the environment?				
c)	Emit hazardous emissions or involve handling hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☑	☐	☐	☐
d)	Be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code §65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☑	☐
e)	For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, and result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☑
f)	Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☑
g)	Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	☐	☑
h)	Significantly increased fire hazard in areas with flammable materials?	☑	☐	☐	☐

Setting

Hazards are related to the risks of fire, explosions, or releases of hazardous substances in the event of accident or upset conditions. Hazards are related to the production, use, storage, and transport of hazardous materials. Industrial production and processing facilities are potential sites for hazardous materials. Some facilities produce hazardous materials as their end product, while others use such materials as an input to their production processes. Examples of hazardous materials used by consumers include fuels, paints, paint thinner, nail polish, and solvents. Hazardous materials may be stored at facilities producing such materials and at facilities where hazardous materials are part of the production processes. Currently, hazardous materials are transported throughout the Bay Area in great quantities via all modes of transportation including rail, highway, water, air, and pipeline.

The potential hazards associated with handling such materials are a function of the materials being processed, processing systems, and procedures used to operate and maintain the facilities where they exist. The hazards that are likely to exist are identified by the physical and chemical properties of the materials being handled and their process conditions, including fires, vapor cloud explosions, thermal radiation, and explosion/overpressure.

Significance Criteria

The proposed project impacts associated with hazards will be considered significant if any of the following occur:

- Non-compliance with any applicable design code or regulation.
- Non-conformance to National Fire Protection Association standards.
- Non-conformance to regulations or generally accepted industry practices related to operating policy and procedures concerning the design, construction, security, leak detection, spill containment or fire protection.
- Exposure to hazardous chemicals in concentrations equal to or greater than the Emergency Response Planning Guideline (ERPG) 2 levels.

Impacts deemed potentially significant will be considered further in the Draft PEIR.

Discussion of Impacts

The 2016 Plan is designed to reduce emissions from existing emission sources and promote the lowest achievable emission rates from new emissions sources. The proposed control measures would affect existing commercial/industrial facilities; increase energy efficiency; establish specifications for coatings, fuels and mobile source exhaust emissions; minimize vehicle trips; accelerate the replacement of high-emitting mobile sources with zero or near zero-emitting mobile sources; establish greater control of industrial stationary sources; establish greater control of fugitive emissions; improve monitoring; and establish educational and outreach programs.

VIII. a, b, and c). The proposed 2016 Plan has the potential to create direct or indirect hazard impacts in several ways. Some control measures that would regulate VOC emissions by establishing VOC content requirements for products such as coatings (SS-22) and digital printing (SS-24) may result in reformulating these products with materials that are low or exempt VOC materials. It is possible that such reformulated products could have increased hazardous physical or chemical properties compared to the products that are currently being used, which could increase hazards through the routine transport or disposal of these materials or through upset conditions involving the accidental release of these materials into the environment. In addition, control measures that could require a control device to be installed may increase the risk of upset or accidental release at industrial facilities due to failure of the control equipment, which would then create an increase in potential hazard impacts in the event of an accidental release of these materials into the environment. Further, the NOx reduction control measures could result in the increased use of ammonia in selective catalytic reduction (SCR) units. Hazards could also be generated by the conversion of gasoline-fueled mobile sources to natural gas or propane fuels. The

PEIR will evaluate the nature and extent of any potential adverse impacts from increased hazards as a result of the 2016 Plan, and will assess whether any such impacts may be significant under the significance criteria outlined above.

VIII. d). Government Code §65962.5 typically refers to a list of facilities that may be subject to Resource Conservation and Recovery Act (RCRA) permits or site cleanup activities. For any facilities affected by the 2016 Plan proposed control measures, it is anticipated that they would be required to manage any and all hazardous materials in accordance with federal, state and local regulations. Control measures are not expected to interfere with site cleanup activities or create additional site contamination. Therefore, this topic is less than significant and will not be further evaluated in the Draft PEIR.

VIII. e). The proposed project will not adversely affect any airport land use plan or result in any safety hazard for people residing or working in the district. U.S. Department of Transportation – Federal Aviation Administration Advisory Circular AC 70/7460-2K provides information regarding the types of projects that may affect navigable airspace. Projects that involve construction or alteration of structures greater than 200 feet above ground level within a specified distance from the nearest runway; objects within 20,000 feet of an airport or seaplane base with at least one runway more than 3,200 feet in length and the object would exceed a slope of 100:1 horizontally (100 feet horizontally for each one foot vertically from the nearest point of the runway); etc., may adversely affect navigable airspace. Control measures in the proposed 2016 Plan are not expected to require construction of tall structures near airports so potential impacts to airport land use plans or safety hazards to people residing or working in the vicinity of local airports are not anticipated. Control measures could result in additional controls of equipment at airports. These controls are expected to establish emission standards or increase the use of electrical equipment, but are not expected to interfere with airport activities. This potential impact will not be further addressed in the Draft PEIR.

VIII. f). The proposed project will not impair implementation of, or physically interfere with any adopted emergency response plan or emergency evacuation plan. Operators of any existing commercial or industrial facilities affected by proposed 2016 Plan control measures will typically have their own emergency response plans for their facilities already in place. Emergency response plans are typically prepared in coordination with the local city or county emergency plans to ensure the safety of not only the public, but the facility employees as well. The implementation of certain control measures could result in the need for additional storage of hazardous materials (e.g., ammonia). Such modifications may require revisions to emergency response plans if new hazardous are introduced to a facility. However, these modifications would not be expected to interfere with emergency response procedures. Adopting the proposed 2016 Plan is not expected to interfere with any emergency response procedures or evacuation plans and, therefore, will not be further evaluated in the Draft PEIR.

VIII. g). The proposed 2016 Plan would typically affect existing commercial or industrial facilities in appropriately zoned areas. Since commercial and industrial areas are not typically located near wildland or forested areas, implementing the proposed control measures has no potential to increase the risk of wildland fires. This topic will not be further evaluated in the Draft PEIR.

VIII. h). The 2016 Plan may contain some control measures that require add-on control equipment or reformulated products that may increase potential fire hazards in areas with flammable materials. The potential for increased probability of explosion, fire, or other hazards will be addressed in the Draft PEIR. Impacts related to public exposure to toxic air contaminants will be addressed in the "Air Quality" section of the Draft PEIR.

Conclusion

Based upon the above considerations, the potentially adverse significant hazard impacts due to the increased probability of explosion, fire, or other risk of upset occurrences associated with the 2016 Plan will be addressed in the Draft PEIR.

		Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
IX.	**HYDROLOGY AND WATER QUALITY.**				
	Would the project:				
a)	Violate any water quality standards or waste discharge requirements?	☑	☐	☐	☐
b)	Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g. the production rate of pre-existing nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted)?	☑	☐	☐	☐
c)	Substantially alter the existing drainage pattern of the site or area, including through alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation on- or off-site?	☐	☐	☐	☑
d)	Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding onsite or offsite?	☐	☐	☐	☑
e)	Create or contribute runoff water that would exceed the capacity of existing or planned stormwater	☐	☐	☐	☑

	drainage systems or provide substantial additional sources of polluted runoff?				
f)	Otherwise substantially degrade water quality?	☑	☐	☐	☐
g)	Place housing within a 100-year flood hazard area, as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☐	☑
h)	Place within a 100-year flood hazard area structures that would impede or redirect flood flows?	☐	☐	☐	☑
i)	Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	☐	☐	☐	☑
j)	Inundation by seiche, tsunami, or mudflow?	☐	☐	☐	☑

Setting

The Air District covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. The area of coverage is vast (about 5,600 square miles). Reservoirs and drainage streams are located throughout the area and discharge into the Bays. Marshlands incised with numerous winding tidal channels containing brackish water are located throughout the Bay Area.

The Bay Area is located within the San Francisco Bay Area Hydrologic Basin. The primary regional groundwater water-bearing formations include the recent and Pleistocene (up to two million years old) alluvial deposits and the Pleistocene Huichica formation. Salinity within the unconfined alluvium appears to increase with depth to at least 300 feet. Water of the Huichica formation tends to be soft and relatively high in bicarbonate, although usable for domestic and irrigation needs.

Significance Criteria

Water Demand:

- The existing water supply does not have the capacity to meet the increased demands of the project, or the project would use more than 263,000 gallons per day of potable water.

Water Quality:

- The project will cause degradation or depletion of ground water resources substantially affecting current or future uses.

- The project will cause the degradation of surface water substantially affecting current or future uses.
- The project will result in a violation of National Pollutant Discharge Elimination System (NPDES) permit requirements.
- The capacities of existing or proposed wastewater treatment facilities and the sanitary sewer system are not sufficient to meet the needs of the project.
- The project results in substantial increases in the area of impervious surfaces, such that interference with groundwater recharge efforts occurs.
- The project results in alterations to the course or flow of floodwaters.

Impacts considered potentially significant will be considered further in the Draft PEIR.

Discussion of Impacts

The 2016 Plan is designed to reduce emissions from existing emission sources and promote the lowest achievable emission rates from new emissions sources. The proposed control measures would affect existing commercial/industrial facilities; increase energy efficiency; establish specifications for coatings, fuels and mobile source exhaust emissions; minimize vehicle trips; accelerate the replacement of high-emitting mobile sources with zero or near zero-emitting mobile sources; establish greater control of industrial stationary sources; establish greater control of fugitive emissions; improve monitoring; and establish educational and outreach programs.

IX. a, and f). The proposed 2016 Plan control measures may require modifications at existing industrial or commercial facilities. Control measures that would control PM and/or SOx emissions could require additional water use and wastewater discharge from air emission control equipment, such as wet gas scrubbers or for dust control (e.g., SS-1, SS-5, SS-9, SS-11, SS-18, SS-19, SS-22 and SS-29). Control measures that promote the use of alternative fuels (TR-18, TR-20, and TR-22) may have the potential to create water quality or groundwater quality impacts in the event of accidental releases of alternative fuels during transport, storage, and handling.

To reduce VOC emissions, some proposed control measures may involve reformulating products such as architectural coatings with low VOC or exempt solvents, e.g., SS-23, SS-24, and SS-25. Under this circumstance, it is not expected that there will be a substantial increase in the volume of wastewater generated by affected facilities, but there could be a slight change in the nature and toxicity of wastewater effluent. The stationary source measures may generate potentially significant adverse water quality impacts from add-on air pollution control equipment such as wet scrubbers, alternative transportation fuels, and reformulated low-VOC consumer products.

Affected facilities that generate wastewater and are subject to waste discharge or pretreatment requirements are required to comply with, and will continue to have to comply with, all relevant wastewater requirements, waste discharge regulations and standards for stormwater runoff, and any other relevant requirements for direct discharges into sewer systems. These standards and permits require water quality monitoring and reporting for onsite water-related activities. Should the volume or discharge limits change as a result of implementing control measures, the facility would be required to consult with the appropriate regional water quality control board and/or the local sanitation district to discuss these changes. Nonetheless, implementing the 2016 Plan may generate additional wastewater that could impact water quality standards or waste discharge requirements. Therefore, this topic will be evaluated further in the Draft PEIR.

IX. b). As discussed above, control measures that would control PM and/or SOx emissions could require additional water use and wastewater discharge from affected facilities. The proposed project contains control measures that would generally allow for a number of different control technologies, some of which could require an increase in water usage at affected facilities (e.g., wet gas scrubbers). Thus, implementing the proposed project could require additional water, some of which could come from ground water supplies, may require expansion of existing water supply facilities or require new water supply facilities. Control measures that encourage the planting of trees/plants could also generate an increase in water use (NW-2 and BL-4), although other measures are aimed at encouraging water conservation and may reduce water use (WR-2). Water demand is potentially significant and will be evaluated further in the Draft PEIR.

IX. c, d, and e). The proposed 2016 Plan generally is expected to impose control requirements on stationary sources at existing commercial and industrial facilities, reduce emissions from mobile sources, and reduce emissions from land use decisions. The proposed project does not have the potential to substantially increase the area subject to runoff since the subject areas would be limited in size and, typically, have already been graded or displaced in some way (e.g., existing industrial or commercial facilities).

2016 Plan control measures would not be expected to generate in and of themselves new structures that could alter existing drainage patterns by altering the course of a river or stream that would result in substantial erosion, siltation, or flooding on or offsite, increase the rate or amount of surface runoff that would exceed the capacity of existing or planned stormwater drainage systems, etc. Although minor modifications might occur at commercial or industrial facilities affected by the proposed 2016 Plan control measures, these facilities have, typically, already been graded and the areas surrounding them have likely already been paved over or landscaped. As a result, further minor modifications at affected facilities that may occur as a result of implementing the 2016 Plan control measures are not expect to alter in any way existing drainage patterns or stormwater runoff. Since this potential adverse impact is not considered to be significant, it will not be further evaluated in the Draft PEIR.

IX. g, h, i, and j) The proposed project does not include the construction of new or relocation of existing housing or other types of facilities and, as such, would not require the placement of housing or other structures within a 100-year flood hazard area. (See also XIII "Population and Housing"). Construction of new housing and structures may occur for reasons other than complying with the 2016 Plan and general population growth. As a result, the proposed project would not be expected to create or substantially increase risks from flooding; expose people or structures to significant risk of loss, injury or death involving flooding; or increase existing risks, if any, of inundation by seiche, tsunami, or mudflow. Consequently, this topic will not be evaluated further in the Draft PEIR.

Conclusions

Implementing the proposed 2016 Plan control measures could result in increased water demand and wastewater generation that could result in potentially significant adverse impacts. Consequently, these impacts will be addressed in the Draft PEIR.

		Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
X.	**LAND USE AND PLANNING.** Would the project:				
a)	Physically divide an established community?	☐	☐	☑	☐
b)	Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to a general plan, specific plan, local coastal program or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☑	☐
c)	Conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☑	☐

Setting

The Air District covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. The area of coverage is vast (about 5,600 square miles) so that land uses vary greatly and include commercial, industrial, residential, agricultural, and open space uses. The 2016 Plan control measures generally affect stationary sources that are located in industrial and commercial areas throughout the jurisdiction of the Air District. Some control measures (e.g., SL-2, and TR-10) may also affect most types of development projects through local and general plans.

Significance Criteria

The proposed project impacts will be considered significant on land use and planning if the project conflicts with the land use and zoning designations established by local jurisdictions, or any applicable habitat conservation or natural community conservation plan.

Discussion of Impacts

The 2016 Plan is designed to reduce emissions from existing emission sources and promote the lowest achievable emission rates from new emissions sources. The proposed control measures would affect existing commercial/industrial facilities; increase energy efficiency; establish specifications for coatings, fuels and mobile source exhaust emissions; minimize vehicle trips; accelerate the replacement of high-emitting mobile sources with zero or near zero-emitting mobile sources; establish greater control of industrial stationary sources; establish greater control of fugitive emissions; improve monitoring; and establish educational and outreach programs.

X. a, and c) The proposed 2016 Plan generally is expected to impose control requirements on stationary sources at existing commercial or industrial facilities, reduce emissions from mobile sources, increase energy efficiency, and reduce emissions from land use decisions. As a result, the proposed 2016 Plan does not require construction of structures for new land uses in any areas of the district and, therefore, is not expected to create divisions in any existing communities or conflict with any applicable habitat conservation or natural community conservation plans.

X. b) Any facilities affected by the proposed 2016 Plan would still be expected to comply with, and not interfere with, any applicable land use plans, zoning ordinances, habitat conservation or natural community conservation plans. There are no provisions of the proposed project that would directly affect these plans, policies, or regulations. Air Districts are specifically excluded from infringing on existing city or county land use authority (California Health & Safety Code §40414). Land use and other planning considerations are determined by local governments and no present or planned land uses in the region or planning requirements will be altered by the 2016 Plan. There are existing links between population growth, land development, housing, traffic, and air quality. The Metropolitan Transportation Commission's (MTC) Transportation 2040 Plan accounts for these links when designing ways to improve air quality, transportation systems, land use compatibility, and housing opportunities in the region. Land use planning is handled at the local level and contributes to development of the 2016 Plan growth projections, for example, but the 2016 Plan does not affect local government land use planning decisions. The proposed 2016 Plan complements existing regional planning activities in the Bay Area.

The Urban Heat Island Control Measure (BL-4) would encourage the planting of additional trees. A large-scale planting program has the potential to conflict with local plans and ordinances. Under this control measure it is expected that ordinances would be revised or developed to encourage additional tree planting and to require planting with certain specific types of trees. Streetscapes, landscapes, setbacks, and corridor plans are expected to be revised or developed to allow room for additional tree planting. Therefore, the control measure may encourage additional tree planting but no significant impacts to land use policies are expected.

Land Use Strategies (TR-10) would attempt to help local governments address air quality and climate change in their general plans while the Indirect Source Review (TR-16) sets air quality performance standards for new and modified development projects. Development itself has the potential for land use impacts, however, the Indirect Source Review Control Measure would attempt to influence land uses and Bicycle Access and Pedestrian Facilities (TR-9) would encourage planning for bicycle and pedestrian facilities in local plans, e.g. general and specific plans, fund bike lanes, routes, paths, and bicycle parking facilities. Therefore, the Indirect Source Review Control Measure is not expected to result in modifications to new development that would generate significant land use impacts. The land use impacts of new development will be evaluated on a case-by-case basis and are generally subject to CEQA requirements and can be mitigated by the local land use agency using General or Specific Plan guidance. Additionally, TR-11 and TR-9 were evaluated in the preparation of Plan Bay Area 2040 and will not be analyzed again in the 2016 Plan.

Some of the control measures would require modifications to existing industrial sources, including refineries. Land uses surrounding industrial areas can vary considerably and include industrial areas, commercial areas, open space, and residential areas. The General Plans and land use plans for areas with industrial land uses, such as Richmond, Martinez, Benicia and Rodeo (Contra Costa County) allow for and encourage the continued use of industrial areas within their respective communities. Some of the General Plans encourage the modernization of existing industrial areas, including the refineries. A summary of the land use policies that apply to industrial areas is summarized for these communities.

1. Richmond General Plan 2030 includes the following land use policies regarding industrial areas (Richmond, 2015).

   - Action LU3.H Industrial Lands Retention and Consolidation Ensure that industrial uses are consolidated around rail and port facilities and work with existing industrial operators, economists and commercial brokers to remain informed about the future demand for industrial land.
   - Action LU3.I Industrial Modernization Support heavy industry’s on-going efforts to modernize and upgrade their plants to reduce energy use, increase efficiency and reduce emissions.

2. City of Martinez General Plan includes the following land use policies regarding industrial areas (Martinez, 2015).

   - 21.51 Expansion of the petroleum refining and related industries must proceed in an orderly fashion and be consistent with protection of the community's air, water, scenic and fiscal resources.
   - 30.351 Adequate land for industrial growth and development should be provided. It is the policy of the City to encourage and assist existing industry to relocate away from the southern perimeter of the waterfront.
   - 30.352 The City should consider further annexation to the east of the current Martinez City Limits to provide space for expansion of industry.
   - 30.353 Industrial expansion accompanied by adverse environmental impact will not be permitted.
   - 30.354 Acceptability of any industry shall be based upon its demonstrated ability to conform to performance standards set by the City.
   - 30.355 Architecture of some merit and landscaping of building sites and parking areas should be required; according to design and landscaping criteria for industrial sites.

3. City of Benicia General Plan includes the following land use policies regarding industrial areas (Benicia, 2015).

- **POLICY 2.6.1:** Preserve industrial land for industrial purposes and certain compatible "service commercial" and ancillary on-site retail uses.
- "Compatible," as defined in the California General Plan Glossary, means "capable of existing together without conflict or detrimental effects." Compatibility will often be decided on a case-by-case basis by the Planning Commission and City Council.
- **POLICY 2.6.2:** Other land uses should not adversely affect existing industrial and commercial land uses.
- Program 2.6.A: Where General Plan amendments propose to convert industrial land to non-industrial or non-commercial uses, require the preparation of a fiscal and economic impact analysis to ensure that the conversion does not adversely affect the city's longterm economic development, or the economic vitality of existing industrial/commercial uses.
- Program 2.6.B: Develop criteria for evaluating whether a proposed non-industrial/non-commercial use would impact the viability of existing industrial/commercial uses. Use the criteria to evaluate non-industrial and non-commercial projects proposed in the Industrial Park.
- **POLICY 2.6.3:** Facilitate continued development of the Industrial Park. Especially encourage general industrial uses to locate in the basin northeast of Downtown (around Industrial Way between East Second and the freeway).
- Program 2.6.C: For lands designated limited industrial, reduce the length of time and number of steps required for development proposals to proceed, consistent with CEQA, community development policies and ordinances, and the design review process for general industrial lands.
- **POLICY 2.6.4:** Link any expansion of Industrial land use to the provision of infrastructure and public services that are to be developed and in place prior to the expansion.
- Program 2.6.D: Continue to update the overall capital improvements program and infrastructure financing plan for the Industrial Park and other major industrial areas.
- Program 2.6.E: Develop Industrial Park infrastructure and public services standards, as approved by the City Council.
- **POLICY 2.6.5:** Establish and maintain a land buffer between industrial/commercial uses and existing and future residential uses for reasons of health, safety, and quality of life.
- Program 2.6.F: Use topography, landscaping, and distance as a buffer between Industrial Park uses and residential uses.
- A buffer is "adequate" to the extent that it physically and psychologically separates uses or properties so as to shield, reduce, or block one set of properties from noise, light, or other nuisances generated on or by the other set of properties. Buffers will be determined on a case by case basis.

4. Rodeo: The Contra Costa General Plan Land Use Element identifies the following land use policies (CCC, 2015).

- 3.163. A buffer of agricultural lands around the eastern Union Oil (currently Phillips 66) property is created in this plan to separate the viewpoint residential area from future industrial development on the property. These open space lands should remain undeveloped.

Based on a review of the applicable land use plans, the construction of equipment within the confines of existing industrial sources is not expected to conflict with any applicable land use plan, policy or regulation of an agency with jurisdiction over the project. The jurisdictions with land use approval recognize and support the continued use of industrial facilities. The minor construction required to comply with the proposed new rule would not interfere with those policies or objectives.

Conclusion

Based upon the above considerations, significant adverse project-specific land use and planning impacts are not expected to occur due to implementation of the 2016 Plan and, therefore, will not be further evaluated in the Draft PEIR.

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
XI. MINERAL RESOURCES. Would the project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☑
b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?	☐	☐	☐	☑

Setting

The Air District covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. The area of coverage is vast (about 5,600 square miles) so that land uses and the affected environment vary greatly throughout the area.

Significance Criteria

The proposed project impacts on mineral resources will be considered significant if:

- The project would result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state.

- The proposed project results in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan.

Discussion of Impacts

The 2016 Plan is designed to reduce emissions from existing emission sources and promote the lowest achievable emission rates from new emissions sources. The proposed control measures would affect existing commercial/industrial facilities; increase energy efficiency; establish specifications for coatings, fuels and mobile source exhaust emissions; minimize vehicle trips; accelerate the replacement of high-emitting mobile sources with zero or near zero-emitting mobile sources; establish greater control of industrial stationary sources; establish greater control of fugitive emissions; improve monitoring; and establish educational and outreach programs.

XI. a and b). There are no provisions of the proposed project that would directly result in the loss of availability of a known mineral resource of value to the region and the residents of the state, or of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan. The proposed 2016 Plan is not expected to deplete non-renewable mineral resources, such as aggregate materials, metal ores, etc., at an accelerated rate or in a wasteful manner because 2016 Plan control measures are typically not mineral resource intensive measures. Therefore, significant adverse impacts to mineral resources are not anticipated.

Conclusion

Based upon the above considerations, significant adverse project-specific impacts to mineral resources are not expect to occur due to implementation of the 2016 Plan and, therefore, will not be further evaluated in the Draft PEIR.

		Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
XII.	**NOISE.** Would the project result in:				
a)	Exposure of persons to or generate noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☑	☐	☐	☐
b)	Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☑	☐
c)	A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☑	☐	☐	☐

d)	A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☑	☐	☐	☐
e)	For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☑
f)	For a project within the vicinity of a private airstrip would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☑

Setting

The Air District covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. The area of coverage is vast (about 5,600 square miles) so that land uses and the affected environment vary greatly throughout the area. The 2016 Plan control measures generally affect stationary sources that are located in industrial and commercial areas throughout the jurisdiction of the Air District. Some control measures (e.g., TR-10, TR-11, and TR-17) may also affect most types of development projects.

Significance Criteria

The 2016 Plan will be considered to have a significant noise impact if the control measures set forth in the Plan will result in any activity that generates noise levels at the boundary of the site where the activity takes place that exceed the levels set forth in any applicable local noise ordinance; or, if the noise threshold is currently exceeded, the activity increases ambient noise levels by more than three decibels at the site boundary.

Discussion of Impacts

The 2016 Plan is designed to reduce emissions from existing emission sources and promote the lowest achievable emission rates from new emissions sources. The proposed control measures would affect existing commercial/industrial facilities; increase energy efficiency; establish specifications for coatings, fuels and mobile source exhaust emissions; minimize vehicle trips; accelerate the replacement of high-emitting mobile sources with zero or near zero-emitting mobile sources; establish greater control of industrial stationary sources; establish greater control of fugitive emissions; improve monitoring; and establish educational and outreach programs.

XII. a, b, c, and d). Implementation of some of the 2016 Plan control measures could result in activities that could temporarily or permanently increase local noise levels in some locations. These activities could include requiring existing commercial or industrial owners/operators of affected facilities to install air pollution control equipment or modify their operations to reduce stationary source emissions. Potential modifications will occur at facilities typically located in appropriately zoned industrial or commercial areas. The 2016 Plan could require additional control equipment that could generate noise impacts, but virtually all of the control equipment would be installed at industrial and commercial facilities.

Ambient noise levels in commercial and industrial areas are typically driven primarily by freeway and/or highway traffic in the area and any heavy-duty equipment used for materials manufacturing or processing at nearby facilities. It is not expected that any modifications to install air pollution control equipment would substantially increase ambient (operational) noise levels in the area, either permanently or intermittently, or expose people to excessive noise levels that would be noticeable above and beyond existing ambient levels. It is not expected that affected facilities would exceed noise standards established in local general plans, noise elements, or noise ordinances currently in effect. Affected facilities would be required to comply with local noise ordinances and elements, which may require construction of noise barriers or other noise control devices. Therefore, it is not expected that affected facilities would exceed noise standards established in local general plans, nose elements, or noise ordinances currently in effect.

Some control measures will provide an incentive for the early retirement of older equipment, replacing it with newer technologies. In most cases, newer equipment and newer engines are more efficient and generate less noise than older equipment. For example, electric and hybrid vehicles generate less noise than standard gasoline fueled vehicles. Therefore, some control measures could result in noise reductions at industrial/commercial facilities or along freeways/highways/streets as a result of quieter engines.

Some of the transportation measures could increase the frequency of transit vehicles or concentrate heavy duty vehicles along some transportation corridors. These future activities could increase noise levels in a community and therefore the potential noise impacts associated with increased localized traffic will be evaluated in the Draft PEIR.

XII. b) It is also not anticipated that the proposed project will cause an increase in ground borne vibration levels because air pollution control equipment is not typically vibration intensive equipment. Consequently, the 2016 Plan will not directly or indirectly cause substantial noise or excessive ground borne vibration impacts. These topics, therefore, will not be further evaluated in the Draft PEIR.

XII. e and f). Affected facilities would still be expected to comply, and not interfere, with any applicable airport land use plans and disclose any excessive noise levels to affected residences and workers pursuant to existing rules, regulations and requirements, such as CEQA. Operations in areas near airports are subject to and must comply with existing community noise ordinances and applicable OSHA or Cal/OSHA workplace noise reduction requirements. In addition to noise generated by current operations, noise sources in each area may include nearby freeways, truck traffic to adjacent businesses, and operational noise from adjacent businesses. None of the proposed control measures in the 2016 Plan would locate residents or commercial buildings or other sensitive noise sources closer to airport operations. There are no components of the proposed 2016 Plan that would substantially increase ambient noise levels within or adjacent to airports. Therefore, these topics will not be further evaluated in the Draft PEIR.

Conclusion

Based upon the above considerations, significant adverse project-specific transportation noise impacts could occur from activities associated with implementation of the 2016 Plan, therefore, potential noise impacts will be further evaluated in the Draft PEIR.

	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
XIII. POPULATION AND HOUSING. Would the project:				
a) Induce substantial population growth in an area either directly (e.g., by proposing new homes and businesses) or indirectly (e.g. through extension of roads or other infrastructure)?	☐	☐	☐	☑
b) Displace a substantial number of existing housing units, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☑
c) Displace a substantial number of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☑

Setting

The Air District covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. The area of coverage is vast (about 5,600 square miles) so that land uses and the affected environment vary greatly throughout the area.

Significance Criteria

The proposed project impacts on population and housing will be considered significant if:

- The demand for temporary or permanent housing exceeds the existing supply.
- The proposed project produces additional population, housing or employment inconsistent with adopted plans either in terms of overall amount or location.

Discussion of Impacts

The 2016 Plan is designed to reduce emissions from existing emission sources and promote the lowest achievable emission rates from new emissions sources. The proposed control measures would affect existing commercial/industrial facilities; increase energy efficiency; establish specifications for coatings, fuels and mobile source exhaust emissions; minimize vehicle trips; accelerate the replacement of high-emitting mobile sources with zero or near zero-emitting mobile sources; establish greater control of industrial stationary sources; establish greater control of fugitive emissions; improve monitoring; and establish educational and outreach programs.

XIII. a). According to the Metropolitan Transportation Commission (MTC), population in the Bay Area is currently about seven million people and is expected to grow to about nine million people by 2040 (MTC, 2013). The proposed project is not anticipated to generate any significant effects, either directly or indirectly, on the Bay Area's population or population distribution. The proposed 2016 Plan generally affects existing commercial or industrial facilities located in predominantly industrial or commercial urbanized areas throughout the district. It is expected that the existing labor pool within the areas surrounding any affected facilities would accommodate the labor requirements for any modifications at affected facilities. In addition, it is not expected that affected facilities will be required to hire additional personnel to operate and maintain new control equipment on site because air pollution control equipment is typically not labor intensive equipment. In the event that new employees are hired, it is expected that the existing local labor pool in the district can accommodate any increase in demand for workers that might occur as a result of adopting the proposed 2016 Plan. As such, adopting the proposed 2016 Plan is not expected to result in changes in population densities or induce significant growth in population.

Implementation of proposed transportation control measures, such as those that would accelerate the penetration of zero or low emission vehicles, trucks, buses, etc., would not induce population growth, but would encourage existing drivers and operators to drive alternative vehicles. Future population growth in the region would occur for reasons other than complying with the 2016 Plan control measures.

XIII. b and c). The proposed 2016 Plan is not expected to increase the demand for new workers in the area. Any demand for new employees is expected to be accommodated from the existing labor pool so no substantial population displacement is expected. Construction activities generated by the 2016 Plan are expected to be limited to stationary sources within industrial and commercial for the installation of new technology or equipment. The 2016 Plan is not expected to require construction activities that would displace people or existing housing.

Conclusion

Based upon the above considerations, significant adverse project-specific population and housing impacts are not expected to occur due to implementation of the 2016 Plan and, therefore, will not be further evaluated in the Draft PEIR.

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
XIV. PUBLIC SERVICES. Would the project:				
a. Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities or a need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the following public services:				
Fire protection?	☐	☐	☑	☐
Police protection?	☐	☐	☑	☐
Schools?	☐	☐	☑	☐
Parks?	☐	☐	☑	☐
Other public facilities?	☐	☐	☑	☐

Setting

Given the large area covered by the Air District (about 5,600 square miles), public services are provided by a wide variety of local agencies. Fire protection and police protection/law enforcement services within the Air District are provided by various districts, organizations, and agencies. There are several school districts, private schools, and park departments within the Air District. Public facilities within the Air District are managed by different county, city, and special-use districts. City and/or County General Plans usually contain goals and policies to assure adequate public services are maintained within the local jurisdiction.

Significance Criteria

The proposed project impacts on public services will be considered significant if the project results in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities or the need for new or physically altered government facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response time or other performance objectives.

Discussion of Impacts

The 2016 Plan is designed to reduce emissions from existing emission sources and promote the lowest achievable emission rates from new emissions sources. The proposed control measures would affect existing commercial/industrial facilities; increase energy efficiency; establish specifications for coatings, fuels and mobile source exhaust emissions; minimize vehicle trips; accelerate the replacement of high-emitting mobile sources with zero or near zero-emitting mobile sources; establish greater control of industrial stationary sources; establish greater control of fugitive emissions; improve monitoring; and establish educational and outreach programs.

XIV. a). There is no potential for significant adverse public service impacts as a result of adopting the proposed 2016 Plan. The proposed project would not result in the need for new or physically altered government facilities in order to maintain acceptable service ratios, response times or other performance objectives. Similarly, most industrial facilities have on-site security that controls public access to facilities so no increase in the need for police services are expected. Most industrial facilities have on-site fire protection personnel and/or have agreements for fire protection services with local fire departments. Although implementing some 2016 Plan control measures may increase the use of alternative fuels, there would be a commensurate reduction in currently used petroleum based fuels. In many situations, implementing the 2016 Plan control measures may reduce hazardous materials use, e.g., formulating coatings or solvents with less hazardous, water-based formulations. For these reasons, implementing the 2016 Plan is not expected to require additional police or fire protection services.

Adopting the proposed 2016 Plan is not expected to induce population growth. As discussed under XIII. Population and Housing, anticipated development to accommodate future population growth would occur for reasons other than complying with 2016 Plan control measures. It is the responsibility of local public agencies with general land use authority, typically cities and counties, to address future growth and assure adequate public services exist in their communities. Thus, implementing the proposed control measures would not increase or otherwise alter the demand for schools, parks or other public facilities in the district. No significant adverse impacts to schools or parks are foreseen as a result of adopting the proposed 2016 Plan.

The Indirect Source Review Control Measure could affect land uses associated with new developments or modified projects in order to minimize emissions. Development itself has the potential for impacts on public services, however, the proposed control measures do not drive land use development, but may impose emission reduction requirements after the decision is already made to go forward with new or redevelopment projects. The Indirect Source Review Control Measure is not expected to result in modifications to new development that would generate significant impacts on public services. The public services impacts of new development will be evaluated on a case-by-case basis by the local land use agency (city or county) and are generally subject to CEQA requirements and can be mitigated by the local land use agency using General or Specific Plan guidance. No significant adverse impacts to schools or parks are foreseen as a result of adopting the proposed 2016 Plan.

Conclusion

Based upon the above considerations, significant adverse project-specific public services impacts are not expected to occur due to implementation of the 2016 Plan and, therefore, will not be further evaluated in the Draft PEIR.

		Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
XV.	**RECREATION.**				
a)	Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☑
b)	Does the project include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?	☐	☐	☐	☑

Setting

The Air District covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. The area of coverage is vast (about 5,600 square miles) so that there are numerous areas for recreational activities. Recreational areas are generally protected and regulated by the City and/or County General Plans at the local level through land use and zoning requirements. Some parks and recreation areas are designated and protected by state and federal regulations.

Regulatory Background

The proposed project impacts on recreation will be considered significant if:

- The project results in an increased demand for neighborhood or regional parks or other recreational facilities.
- The project adversely affects existing recreational opportunities.

Discussion of Impacts

The 2016 Plan is designed to reduce emissions from existing emission sources and promote the lowest achievable emission rates from new emissions sources. The proposed control measures would affect existing commercial/industrial facilities; increase energy efficiency; establish specifications for coatings, fuels and mobile source exhaust emissions; minimize vehicle trips; accelerate the replacement of high-emitting mobile sources with zero or near zero-emitting mobile sources; establish greater control of industrial stationary sources; establish greater control of fugitive emissions; improve monitoring; and establish educational and outreach programs.

XV. a and b). As discussed under "Land Use and Planning" and "Population and Housing" above, there are no provisions of the proposed project that would affect land use plans, policies, ordinances, or regulations. Land use and other planning considerations are determined by local governments. No land use or planning requirements, including those related to recreational facilities, will be altered by the proposal. The proposed project does not have the potential to directly or indirectly induce population growth or redistribution. As a result, the proposed project would not increase the use of, or demand for existing neighborhood and/or regional parks or other recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment.

Conclusion

Based upon the above considerations, no significant adverse project-specific impacts to population and housing are expected to occur due to implementation of the 2016 Plan and, therefore, will not be further evaluated in the Draft PEIR.

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
XVI. TRANSPORTATION/TRAFFIC. Would the project:				
a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	☐	☐	☐	☑
b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established b the	☑	☐	☐	☐

	county congestion management agency for designated roads or highways?				
c)	Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	☐	☐	☐	☑
d)	Substantially increase hazards because of a design feature (e.g. sharp curves or dangerous intersections) or incompatible uses (e.g. farm equipment)?	☐	☐	☐	☑
e)	Result in inadequate emergency access?	☐	☐	☐	☑
f)	Conflict with adopted policies, plans or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?	☐	☐	☐	☑

Setting

The Air District covers all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties and portions of southwestern Solano and southern Sonoma Counties. The area of coverage is vast (about 5,600 square miles) so that land uses and the affected environment vary greatly throughout the area.

Significance Criteria

The proposed project impacts on transportation and traffic will be considered significant if:

- A major roadway is closed to all through traffic, and no alternate route is available.
- The project conflicts with applicable policies, plans or programs establishing measures of effectiveness, thereby decreasing the performance or safety of any mode of transportation.
- There is an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system.
- The demand for parking facilities is substantially increased.
- Water borne, rail car or air traffic is substantially altered.
- Traffic hazards to motor vehicles, bicyclists or pedestrians are substantially increased.

Impacts deemed potentially significant will be considered further in the Draft PEIR.

Discussion of Impacts

The 2016 Plan is designed to reduce emissions from existing emission sources and promote the lowest achievable emission rates from new emissions sources. The proposed control measures would affect existing commercial/industrial facilities; increase energy efficiency; establish specifications for coatings, fuels and mobile source exhaust emissions; minimize vehicle trips; accelerate the replacement of high-emitting mobile sources with zero or near zero-emitting mobile sources; establish greater control of industrial stationary sources; establish greater control of fugitive emissions; improve monitoring; and establish educational and outreach programs.

XVI. a). Implementation of the proposed 2016 Plan is not expected to substantially increase vehicle trips or vehicle miles traveled (VMT) in the Bay Area. The 2016 Plan relies on transportation and related control measures developed by the Association of Bay Area Governments (ABAG) and the Metropolitan Transportation Commission (MTC) and are included in the Plan Bay Area 2040, and, thus would not conflict with the applicable Regional Transportation Plan (RTP). These control measures include strategies to enhance mobility by reducing congestion through transportation infrastructure improvements, mass transit improvements, increasing telecommunications products and services, enhanced bicycle and pedestrian facilities, etc. Specific strategies that serve to reduce vehicle trips and vehicle miles traveled, such as strategies resulting in greater reliance on mass transit, ridesharing, telecommunications, etc., are expected to result in reducing traffic congestion. Although population in the Bay Area is expected to increase by 2.1 million people by 2040, implementing of the control measures, in conjunction with the 2013 RTP/SCS, would ultimately result in greater percentages of the population using transportation modes other than single occupancy vehicles. Even if congestion in the region increases compared to the baseline, this would occur for reasons other than complying with 2016 Plan. Therefore, it is expected that implementing the 2016 Plan, including the RTP/SCS control measures could ultimately provide transportation improvements and congestion reduction benefits and would not conflict with applicable transportation plans, ordinances, or policies.

XVI. b). Implementation of proposed 2016 Plan control measures that accelerate the penetration of zero or low emission vehicles into Bay Area fleets would not induce congestion because there are a finite number of drivers in the region at any one time. Drivers who purchase low or zero emission vehicles would not be driving older high emitting vehicles at the same time they are driving the new low emitting vehicles.

Implementation of 2016 Plan control measures that could result in the construction activities include TR-3 (Local and Regional Bus Service), TR-4 (Local and Regional Rail Service), TR-9 (Bicycle and Pedestrian Facilities), and TR-18 (Goods Movement). Construction activities would be required to create new bus and rail routes, build new HOV, bicycle and pedestrian lanes, as well as construction associated with transportation corridors in the Bay Area. Construction associated with rail and truck routes/corridors are expected to be located primarily in commercial and industrial zones within the Bay Area. Therefore, construction activities are expected to occur along heavily travelled roadways. Construction traffic could potentially result in increased traffic volumes on heavily traveled streets and require temporary lane closures. Construction activities may result in the following impacts: (1) Temporary reduction in the level of service on major arterials; (2) temporary closure of a roadway or major arterial; (3) temporary closure of a railroad line; (3) temporary impact on businesses or residents within the construction area; (4) removal of on-street parking; and (5) conflicts with public transportation system (e.g., temporary removal of bus stops). The above listed construction traffic impacts, although temporary in nature, are potentially significant and will be evaluated in the Draft PEIR.

XVI. c). Implementation of proposed 2016 Plan control measures would not affect air traffic or air traffic patterns. The proposed project is not expected to adversely affect any airport land use plan or result in any safety hazards for people residing or working in the Bay Area because no control measures would result in construction or alteration of structures greater than 200 feet above ground level within the maximum 20,000-foot navigable space boundaries. In addition, it is not expected that implementing 2016 control measures would require transporting goods and materials by plane. Finally, although the 2016 Plan includes control measure TR-17 (Planes), it is expected that this measure would incentivize cleaner airplane engines, but would not result in a change in air traffic patterns, including either increases in traffic levels or changes in locations that result in substantial safety risks.

XVI. d). Implementation of proposed 2016 Plan control measures would not increase roadway design hazards or incompatible risks. Most control measures would not involve roadway construction or modifications. However, to the extent that implementing components of some of the control measures and related measures to further develop roadway infrastructure to improve traffic flow may implicate construction, it is expected that there would ultimately be reductions in roadway hazards or incompatible risks as part of any roadway infrastructure improvements and reduced congestion.

XVI. e). Implementation of proposed 2016 Plan control measures would not affect emergency access routes at affected facilities. Control measures that would promote installation of air pollution control equipment would not require major construction of any structures that might obstruct emergency access routes at any affected facilities. Control measures that would promote the acceleration of low or zero emission vehicles into the regional fleet would not change travel patterns on regional roadways compared to the baseline. Although some control measures may result in installing battery charging stations, most jurisdictions have ordinances pertaining to maintaining at existing, or constructing adequate emergency access to many existing facilities and new land use projects.

XVI. f). Implementation of proposed 2016 Plan control measures would not conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities. The 2016 Plan is expected to provide control measures aimed at reducing the per capita vehicle miles traveled (VMT) over the next 25 years, however, total demand to move people and goods will continue to grow due to the region's population increase. A strategic expansion of the regional transportation system is needed in order to provide the region with the mobility it needs. The Plan Bay Area targets this expansion around transportation systems that have room to grow, including transit, high-speed rail, active transportation, express/high occupancy transit lanes, and goods movement.

The Plan Bay Area is expected to call for expansion of transit facilities and services over the next 25 years. The transportation and related control measures would specifically encourage and provide incentives for implementing alternative transportation programs and strategies.

Conclusion

Based upon the above discussions, potentially significant adverse project-specific impacts to transportation and traffic systems associated with implementation of proposed 2016 Plan traffic control measures could result in significant adverse traffic impacts during construction activities on existing roadways. Therefore, this topic will be analyzed in the Draft PEIR.

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	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less-than-Significant Impact	No Impact
XVII. UTILITIES/SERVICE SYSTEMS. Would the project:				
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☑	☐	☐	☐
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☑	☐	☐	☐
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☑
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or would new or expanded entitlements needed?	☑	☐	☐	☐
e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☑	☐	☐	☐
f) Be served by a landfill with sufficient permitted capacity to accommodate the project’s solid waste disposal needs?	☑	☐	☐	☐
g) Comply with federal, state, and local statutes and regulations related to solid waste?	☐	☐	☐	☑

Setting

Given the large area covered by the Air District, public utilities are provided by a wide variety of local agencies. The most industrial facilities have wastewater and storm water treatment facilities and discharge treated wastewater under the requirements of National Pollutant Discharge Elimination System (NPDES) permits. Water is supplied to affected facilities by several water purveyors in the Bay Area. Solid waste is handled through a variety of municipalities, through recycling activities and at disposal sites.

There are no hazardous waste disposal sites within the jurisdiction of the Air District. Hazardous waste generated at area wood products coatings manufacturers, which is not recycled off-site, is required to be disposed of at a licensed hazardous waste disposal facility. Two such facilities are the Chemical Waste Management Inc. (CWMI) Kettleman Hills facility in King's County, and the Safety-Kleen facility in Buttonwillow (Kern County). Hazardous waste can also be transported to permitted facilities outside of California.

City and/or County General Plans usually contain goals and policies to assure adequate utilities and service systems are maintained within the local jurisdiction.

Significance Criteria

The proposed project impacts on utilities/service systems will be considered significant if:

- The capacities of existing or proposed wastewater treatment facilities and the sanitary sewer system are not sufficient to meet the needs of the project.
- An increase in demand for utilities impacts the current capacities of the electric utilities.
- The existing water supply does not have the capacity to meet the increased demands of the project, or the project would use a substantial amount of potable water.
- The project increases demand for water by more than 263,000 gallons per day.
- The generation and disposal of hazardous and non-hazardous waste exceeds the capacity of designated landfills.

Discussion of Impacts

The 2016 Plan is designed to reduce emissions from existing emission sources and promote the lowest achievable emission rates from new emissions sources. The proposed control measures would affect existing commercial/industrial facilities; increase energy efficiency; establish specifications for coatings, fuels and mobile source exhaust emissions; minimize vehicle trips; accelerate the replacement of high-emitting mobile sources with zero or near zero-emitting mobile sources; establish greater control of industrial stationary sources; establish greater control of fugitive emissions; improve monitoring; and establish educational and outreach programs.

XVII. a, and e). As discussed in Hydrology/Water Quality (IX. a) above, the proposed 2016 Plan control measures may require modifications at existing industrial or commercial facilities. Control measures that would control PM and/or SOx emissions (SS-1 and SS-5) could require additional water use and wastewater discharge from devices like wet gas scrubbers (e.g., PM from Fluid Catalytic Cracking and SO_2 from Sulfur Recovery Units). The stationary source measures may generate potentially significant adverse water quality impacts from add-on air pollution control equipment such as wet scrubbers, alternative transportation fuels, and reformulated low-VOC coatings.

Affected facilities that generate wastewater and are subject to waste discharge or pretreatment requirements are required to comply with, and will continue to have to comply with, all relevant wastewater requirements, waste discharge regulations and standards for stormwater runoff, and any other relevant requirements for direct discharges into sewer systems. These standards and permits require water quality monitoring and reporting for onsite water-related activities. Should the volume or discharge limits change as a result of implementing control measures, the facility would be required to consult with the appropriate regional water quality control board and/or the local sanitation district to discuss these changes. Nonetheless, implementing the 2016 Plan may generate additional wastewater that could impact water quality standards or waste discharge requirements. Therefore, this topic will be evaluated further in the Draft PEIR.

XVII. b) and d). As discussed in Hydrology and Water Quality (IX. b), control measures that would control PM and/or SOx emissions (e.g., SS-1 and SS-5) could require additional water use and wastewater discharge from affected facilities. The 2016 Plan contains control measures that would generally allow for a number of different control technologies, some of which could require an increase in water usage at affected facilities (e.g., wet gas scrubbers). Thus, implementing the proposed project could require additional water, some of which could come from ground water supplies. Therefore, this topic will be evaluated further in the Draft PEIR.

XVII. c) As discussed in Hydrology and Water Quality (IX. c), the proposed project does not have the potential to substantially increase the area subject to runoff since the subject areas would be limited in size and, typically, have already been graded or displaced in some way (e.g., existing industrial or commercial facilities). Although minor modifications might occur at commercial or industrial facilities affected by the proposed 2016 Plan control measures, these facilities have, typically, already been graded and the areas surrounding them have likely already been paved over or landscaped. As a result, further minor modifications at affected facilities that may occur as a result of implementing the 2016 Plan control measures are not expect to alter in any way existing drainage patterns or stormwater runoff. Since this potential adverse impact is not considered to be significant, it will not be further evaluated in the Draft PEIR.

XVII. f). The proposed 2016 Plan could require facilities to install air pollution control equipment, such as carbon adsorption devices, particulate filters, catalytic incineration, selective catalytic reduction or other types of control equipment that could increase the amount of solid/hazardous wastes generated in the district due to the disposal of spent catalyst, filters or other mechanisms used in the control equipment. Solid waste impacts would be considered significant if the impacts resulted in a violation of local, state or federal solid waste standards. Also, solid waste impacts would be significant if the additional potential waste volume exceeded the existing capacity of district landfills.

Other control measures may result in potentially significant adverse solid and hazardous waste impacts from the use of particulate filters, accelerated vehicle retirement programs (TR-20), evaporative controls utilizing carbon canisters, facility modernization requirements, early retirement of inefficient, older equipment, etc. The potential solid/hazardous waste impacts from implementing the proposed 2016 Plan will be analyzed in the Draft PEIR.

XVII. g). Adopting the proposed 2016 Plan is not expected to interfere with affected facilities' abilities to comply with federal, state, or local statutes and regulations related to solid and hazardous waste handling or disposal. This specific topic will not be further evaluated in the Draft PEIR.

Other Utilities/Service System Impacts: The 2016 Plan includes control measures that would promote energy efficiency and conservation, thereby providing energy conservation benefits (EN-2 and BL-1). In addition, implementing the proposed 2016 Plan may result in owners/operators of affected facilities replacing old inefficient equipment with newer more energy efficient equipment, thus providing beneficial impacts on energy demand. Alternatively, some control measures (BL-4 and NW-2) will promote tree planting, which are expected to result in energy conservation because indoor temperatures will be lowered which will lower the demand for cooling.

In spite of this, implementing some proposed control measures could increase energy demand in the region, as follows:

- Control measures that would require air pollution controls at stationary sources may increase electrical or natural gas demand (SS-1, SS-5, SS-6, SS-7, SS-8, SS-9, SS-11, SS-12, SS-16, SS-17, SS-18, SS-19, SS-20, SS-21, SS-22, TR-11, AG-1, and AG-2).
- Control measures that accelerate the penetration of zero and near-zero emission vehicles, trucks, buses, construction equipment, etc., may result in increased electrical demand (TR-3, TR-4, TR-14, TR-18, TR-19, TR-20, TR-21, TR-22, TR-23, BL-1, and BL-2).

The net effect of implementing the control measures may be an increase in regional energy demand, in spite of implementing energy efficiency and conservation measures, and may result in the need for new or substantially altered power or natural gas systems and create significant effects on peak and base period demands. Thus, implementation of the 2016 Plan may result in significant impacts on energy resources.

Conclusion

Based upon the above considerations, the potential adverse wastewater, water supply, solid/hazardous waste, and energy resources services impacts from implementing the proposed 2016 Plan will be analyzed in the Draft PEIR.

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
XVIII. MANDATORY FINDINGS OF SIGNIFICANCE.				
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory?	☐	☐	☐	☑
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)	☑	☐	☐	☐
c) Does the project have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?	☑	☐	☐	☐

XVIII. MANDATORY FINDINGS OF SIGNIFICANCE

Discussion of Impacts

XVIII. a). The proposed 2016 Plan does not have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory, as discussed in the previous sections of the CEQA checklist. As discussed in Section IV, Biological Resources and Section V, Cultural Resources, no significant adverse impacts are expected to biological or cultural resources. Overall improvements in air quality are, ultimately, expected to provide substantial benefits to local biological resources in the District. Therefore, this topic will not be evaluated further in the Draft Program EIR.

XVIII. b). The project that the Air District is evaluating in this document, and will be evaluating in the PEIR, is the adoption of the proposed 2016 Plan. The proposed 2016 Plan consists of a large number of proposed control measures, and each one of the control measures involves regulatory action or other governmental action that may result in multiple individual actions by private entities or governmental agencies that may have the potential for beneficial or adverse environmental impacts. The project may therefore result in a large number of discrete actions, which the PEIR will evaluate to the extent that they are sufficiently concrete and foreseeable at this stage to make such an evaluation feasible and meaningful. The impacts of each such discrete action may be individually limited, but taken together they may create a significant cumulative impact. Based on the analysis set forth in previous sections if this document, the discrete actions that may occur as a result of the 2016 Plan may generate significant cumulative impacts in the following areas: air quality, global climate change as a result of greenhouse gas emissions, hazards and hazardous materials impacts, hydrology and water resources, noise, transportation and traffic, and utilities and services systems. The PEIR will evaluate the potential for the cumulative effect of all of the discrete actions that may result from the 2016 Plan to create a significant impact in each of these areas.

In addition, the PEIR will evaluate the potential for the actions and activities that will result from the adoption of the 2016 Plan to create a significant environmental impact in conjunction with other past, current, or reasonably foreseeable future actions or activities. This aspect of the analysis will address existing or proposed sources of emissions (or sources of other types of environmental impacts) that will not be affected by the 2016 Plan. The analysis will evaluate whether any impacts caused by the discrete actions that will result from adoption of the 2016 Plan, together with the impacts from other existing or proposed sources not affected by the 2016 Plan, will be significant. Any such significant cumulative impacts of this project (the 2016 Plan) in conjunction with other past, present and probable future projects need to be evaluated under CEQA. The PEIR will evaluate the potential for such significant cumulative impacts in each of the areas stated above.

XVIII. c): The proposed 2016 Plan may have the potential to create significant adverse impacts to human beings because it may create potentially significant adverse impacts in the following areas: air quality, greenhouse gas emissions, hazards and hazardous materials impacts, hydrology and water resources, noise, transportation and traffic, and utilities and service systems. Significant adverse impacts to any of these areas may have the potential to adversely affect public health. Potentially significant adverse environmental impacts that could cause substantial adverse effects on human beings, either directly or indirectly, will be evaluated in the Draft PEIR. If any impacts are determined to be significant, evaluation of feasible mitigation measures and alternatives to the project will be included in the Draft PEIR.

CHAPTER 3

REFERENCES

Chapter 3

References

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Metropolitan Transportation Commission (MTC), 2013. Environmental Impact Report Plan Bay Area Draft. Metropolitan Transportation Commission and Bay Area Association of Governments. April, 2013.

City of Richmond (Richmond), 2015. Land Use and Urban Design, Richmond General Plan 2030. http://www.ci.richmond.ca.us/DocumentCenter/Home/View/8809.

APPENDIX B

COMMENTS RECEIVED ON THE NOTICE OF PREPARATION/INITIAL STUDY

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2017 CLEAN AIR PLAN/REGIONAL CLIMATE PROECTION STRATEGY (2017 PLAN)

COMMENTS RECEIVED ON NOP/IS

INTRODUCTION

The Notice of Preparation/Initial Study (NOP/IS) (Appendix A) was circulated for a 32-day public review and comment period, which started on June 16, 2016 and ended on July 18, 2016.

The NOP/IS included a detailed project description, the environmental setting for each environmental resource, and an analysis of each environmental resource on the California Environmental Quality Act (CEQA) checklist including all potentially significant environmental impacts. BAAQMD received 15 comment letters on the NOP/IS during the public comment period.

Letter	Commentator	Page
#1	State Clearinghouse	B-3
#2	Mike Vandeman	B-7
#3	Hartmut Wiesenthal	B-10
#4	California Council for Environmental and Economic Balance	B-15
#5	California Geothermal Heat Pump Association	B-19
#6	Sustainable Silicon Valley	B-22
#7	Santa Clara Valley Transport Authority	B-26
#8	Mark Roest	B-28
#9	Northern California Breathmobile	B-31
#10	Rich Walter	B-32
#11	San Francisco Bay Conservation and Development Commission	B-34
#12	StopWaste	B-36
#13	Calpine Corporation	B-49
#14	Transportation Solutions Defense and Education Fund	B-52
#15	City of San Jose	B-62

STATE OF CALIFORNIA
GOVERNOR'S OFFICE *of* PLANNING AND RESEARCH
STATE CLEARINGHOUSE AND PLANNING UNIT

EDMUND G. BROWN JR.
GOVERNOR

KEN ALEX
DIRECTOR

RECEIVED
2016 JUN 20 PM 1:54
BAY AREA AIR QUALITY MANAGEMENT DISTRICT

Notice of Preparation

June 17, 2016

To: Reviewing Agencies

Re: 2016 Clean Air Plan/Regional Climate Protection Strategy
SCH# 2016062046

Attached for your review and comment is the Notice of Preparation (NOP) for the 2016 Clean Air Plan/Regional Climate Protection Strategy draft Environmental Impact Report (EIR).

Responsible agencies must transmit their comments on the scope and content of the NOP, focusing on specific information related to their own statutory responsibility, within 30 days of receipt of the NOP from the Lead Agency. This is a courtesy notice provided by the State Clearinghouse with a reminder for you to comment in a timely manner. We encourage other agencies to also respond to this notice and express their concerns early in the environmental review process.

Please direct your comments to:

Josh Pollak
Bay Area Air Quality Management District
375 Beale St, Suite 600
San Francisco, CA 94105

with a copy to the State Clearinghouse in the Office of Planning and Research. Please refer to the SCH number noted above in all correspondence concerning this project.

If you have any questions about the environmental document review process, please call the State Clearinghouse at (916) 445-0613.

Sincerely,

Scott Morgan

Scott Morgan
Director, State Clearinghouse

Attachments
cc: Lead Agency

Document Details Report
State Clearinghouse Data Base

SCH# **2016062046**
Project Title 2016 Clean Air Plan/Regional Climate Protection Strategy
Lead Agency Bay Area Air Quality Management District

Type **NOP** Notice of Preparation

Description The 2016 Clean Air Plan/Regional Climate Protection Strategy will be a roadmap for the Air District's efforts over the next few years to reduce air pollution and protect public health and the global climate. The 2016 Plan is required by the California Clean Air Act to identify potential rules, control measures, and strategies for the Bay Area to implement in order to meet state standards for ozone. The CAP update will include the Bay Area's first comprehensive Regional Climate Protection Strategy, which will identify potential rules, control measures, and strategies that the Air District can pursue to reduce greenhouse gases in the Bay Area. The proposed 2016 Plan provides a strategy for reducing emissions of ozone precursors, greenhouse gases, particulate matter, and/or toxic air contaminants in the Bay Area.

Lead Agency Contact

Name Josh Pollak
Agency Bay Area Air Quality Management District
Phone 415-749-8435 ***Fax***
email
Address 375 Beale St, Suite 600
City San Francisco ***State*** CA ***Zip*** 94105

Project Location

County Contra Costa, Alameda, Marin, San Francisco, San Mateo, ...
City
Region
Cross Streets
Lat / Long
Parcel No.
Township ***Range*** ***Section*** ***Base***

Proximity to:

Highways
Airports
Railways
Waterways
Schools
Land Use Multi-Jurisdictional (Bay Area Counties)

Project Issues Aesthetic/Visual; Agricultural Land; Air Quality; Archaeologic-Historic; Biological Resources; Geologic/Seismic; Noise; Population/Housing Balance; Public Services; Recreation/Parks; Sewer Capacity; Solid Waste; Toxic/Hazardous; Traffic/Circulation; Water Quality; Landuse; Cumulative Effects

---

Reviewing Agencies Resources Agency; California Energy Commission; Department of Parks and Recreation; San Francisco Bay Conservation and Development Commission; Department of Water Resources; Department of Fish and Wildlife, Region 3; Native American Heritage Commission; Public Utilities Commission; Caltrans, District 4; Regional Water Quality Control Board, Region 2

Date Received 06/17/2016 ***Start of Review*** 06/17/2016 ***End of Review*** 07/18/2016

Note: Blanks in data fields result from insufficient information provided by lead agency.

Print Form

Appendix C

Notice of Completion & Environmental Document Transmittal

20160602046

Mail to: State Clearinghouse, P.O. Box 3044, Sacramento, CA 95812-3044 (916) 445-0613
For Hand Delivery/Street Address: 1400 Tenth Street, Sacramento, CA 95814

SCH #

Project Title: 2016 Clean Air Plan/Regional Climate Protection Strategy

Lead Agency: Bay Area Air Quality Management District — Contact Person: Josh Pollak
Mailing Address: 375 Beale Street, Suite 600 — Phone: 415-749-8435
City: San Francisco — Zip: 94105 — County: San Francisco

Project Location: County: 9 Bay Area Counties — City/Nearest Community:
Cross Streets: — Zip Code:
Longitude/Latitude (degrees, minutes and seconds): ° ′ ″ N / ° ′ ″ W Total Acres:
Assessor's Parcel No.: — Section: — Twp.: — Range: — Base:
Within 2 Miles: State Hwy #: — Waterways:
Airports: — Railways: — Schools:

Document Type:

CEQA: ☒ NOP ☐ Early Cons ☐ Neg Dec ☐ Mit Neg Dec ☐ Draft EIR ☐ Supplement/Subsequent EIR (Prior SCH No.) Other:

NEPA: ☐ NOI ☐ EA ☐ Draft EIS ☐ FONSI

Other: ☐ Joint Document ☐ Final Document ☐ Other:

Governor's Office of Planning & Research
JUN 17 2016
STATE CLEARINGHOUSE

Local Action Type:

☐ General Plan Update ☐ General Plan Amendment ☐ General Plan Element ☐ Community Plan
☐ Specific Plan ☐ Master Plan ☐ Planned Unit Development ☐ Site Plan
☐ Rezone ☐ Prezone ☐ Use Permit ☐ Land Division (Subdivision, etc.)
☐ Annexation ☐ Redevelopment ☐ Coastal Permit ☒ Other: Clean Air Plan

Development Type:

☐ Residential: Units Acres
☐ Office: Sq.ft. Acres Employees
☐ Commercial: Sq.ft. Acres Employees
☐ Industrial: Sq.ft. Acres Employees
☐ Educational:
☐ Recreational:
☐ Water Facilities: Type MGD
☐ Transportation: Type
☐ Mining: Mineral
☐ Power: Type MW
☐ Waste Treatment: Type MGD
☐ Hazardous Waste: Type
☒ Other: Clean Air Plan/Regional Climate Protection Strategy

Project Issues Discussed in Document:

☒ Aesthetic/Visual
☒ Agricultural Land
☒ Air Quality
☒ Archeological/Historical
☒ Biological Resources
☐ Coastal Zone
☐ Drainage/Absorption
☐ Economic/Jobs
☐ Fiscal
☐ Flood Plain/Flooding
☐ Forest Land/Fire Hazard
☒ Geologic/Seismic
☐ Minerals
☒ Noise
☒ Population/Housing Balance
☒ Public Services/Facilities
☒ Recreation/Parks
☐ Schools/Universities
☐ Septic Systems
☒ Sewer Capacity
☐ Soil Erosion/Compaction/Grading
☒ Solid Waste
☒ Toxic/Hazardous
☒ Traffic/Circulation
☐ Vegetation
☒ Water Quality
☐ Water Supply/Groundwater
☐ Wetland/Riparian
☐ Growth Inducement
☒ Land Use
☒ Cumulative Effects
☐ Other:

Present Land Use/Zoning/General Plan Designation:

Multi-Jurisdictional (Bay Area Counties)

Project Description: *(please use a separate page if necessary)*

The 2016 Clean Air Plan/Regional Climate Protection Strategy (2016 Plan) will be a roadmap for the Air District's efforts over the next few years to reduce air pollution and protect public health and the global climate. The 2016 Plan is required by the California Clean Air Act (CAA) to identify potential rules, control measures, and strategies for the Bay Area to implement in order to meet state standards for ozone. The CAP update will include the Bay Area's first comprehensive Regional Climate Protection Strategy, which will identify potential rules, control measures, and strategies that the Air District can pursue to reduce greenhouse gases in the Bay Area. The proposed 2016 Plan provides a strategy for reducing emissions of ozone precursors, greenhouse gases, particulate matter, and/or toxic air contaminants in the Bay Area.

Note: The State Clearinghouse will assign identification numbers for all new projects. If a SCH number already exists for a project (e.g. Notice of Preparation or previous draft document) please fill in.

Revised 2010

NOP Distribution List

County: San Francisco

SCH# 2015062045

Resources Agency

- **Resources Agency** Nadell Gayou
- **Dept. of Boating & Waterways** Denise Peterson
- **California Coastal Commission** Elizabeth A. Fuchs
- **Colorado River Board** Lisa Johansen
- **Dept. of Conservation** Elizabeth Carpenter
- **California Energy Commission** Eric Knight
- **Cal Fire** Dan Foster
- **Central Valley Flood Protection Board** James Herota
- **Office of Historic Preservation** Ron Parsons
- **Dept of Parks & Recreation** Environmental Stewardship Section
- **California Department of Resources, Recycling & Recovery** Sue O'Leary
- **S.F. Bay Conservation & Dev't. Comm.** Steve McAdam
- **Dept. of Water Resources** Resources Agency, Nadell Gayou

Fish and Game

- **Depart. of Fish & Wildlife** Scott Flint, Environmental Services Division
- **Fish & Wildlife Region 1** Curt Babcock
- **Fish & Wildlife Region 1E** Laurie Harnsberger
- **Fish & Wildlife Region 2** Jeff Drongesen
- **Fish & Wildlife Region 3** Craig Weightman
- **Fish & Wildlife Region 4** Julie Vance
- **Fish & Wildlife Region 5** Leslie Newton-Reed, Habitat Conservation Program
- **Fish & Wildlife Region 6** Tiffany Ellis, Habitat Conservation Program
- **Fish & Wildlife Region 6 I/M** Heidi Calvert, Inyo/Mono, Habitat Conservation Program
- **Dept. of Fish & Wildlife M** Becky Ota, Marine Region

Other Departments

- **Food & Agriculture** Sandra Schubert, Dept. of Food and Agriculture
- **Depart. of General Services** Public School Construction
- **Dept. of General Services** Cathy Buck/George Carollo, Environmental Services Section
- **Delta Stewardship Council** Kevan Samsam
- **Housing & Comm. Dev.** CEQA Coordinator, Housing Policy Division

Independent Commissions, Boards

- **Delta Protection Commission** Michael Machado
- **OES (Office of Emergency Services)** Monique Wilber
- **Native American Heritage Comm.** Debbie Treadway
- **Public Utilities Commission** Supervisor
- **Santa Monica Bay Restoration** Guangyu Wang
- **State Lands Commission** Jennifer Deleong
- **Tahoe Regional Planning Agency (TRPA)** Cherry Jacques

Cal State Transportation Agency CalSTA

- **Caltrans - Division of Aeronautics** Philip Crimmins
- **Caltrans – Planning HQ LD-IGR** Terri Pencovic
- **California Highway Patrol** Suzann Ikeuchi, Office of Special Projects

Dept. of Transportation

- **Caltrans, District 1** Rex Jackman
- **Caltrans, District 2** Marcelino Gonzalez
- **Caltrans, District 3** Eric Federicks – South, Susan Zanchi - North
- **Caltrans, District 4** Patricia Maurice
- **Caltrans, District 5** Larry Newland
- **Caltrans, District 6** Michael Navarro
- **Caltrans, District 7** Dianna Watson
- **Caltrans, District 8** Mark Roberts
- **Caltrans, District 9** Gayle Rosander
- **Caltrans, District 10** Tom Dumas
- **Caltrans, District 11** Jacob Armstrong
- **Caltrans, District 12** Maureen El Harake

Cal EPA

Air Resources Board

- Airport & Freight, Cathi Slaminski
  - Transportation Projects, Nesamani Kalandiyur
  - Industrial/Energy Projects, Mike Tollstrup
- **State Water Resources Control Board** Regional Programs Unit, Division of Financial Assistance
- **State Water Resources Control Board** Cindy Forbes – Asst Deputy, Division of Drinking Water
- **State Water Resources Control Board** **Div. Drinking Water #________**
- **State Water Resources Control Board** Student Intern, 401 Water Quality Certification Unit, Division of Water Quality
- **State Water Resouces Control Board** Phil Crader, Division of Water Rights
- **Dept. of Toxic Substances Control** CEQA Tracking Center
- **Department of Pesticide Regulation** CEQA Coordinator

Regional Water Quality Control Board (RWQCB)

- **RWQCB 1** Cathleen Hudson, North Coast Region (1)
- **RWQCB 2** Environmental Document Coordinator, San Francisco Bay Region (2)
- **RWQCB 3** Central Coast Region (3)
- **RWQCB 4** Teresa Rodgers, Los Angeles Region (4)
- **RWQCB 5S** Central Valley Region (5)
  - **RWQCB 5F** Central Valley Region (5), Fresno Branch Office
  - **RWQCB 5R** Central Valley Region (5), Redding Branch Office
- **RWQCB 6** Lahontan Region (6)
  - **RWQCB 6V** Lahontan Region (6), Victorville Branch Office
- **RWQCB 7** Colorado River Basin Region (7)
- **RWQCB 8** Santa Ana Region (8)
- **RWQCB 9** San Diego Region (9)
- Other __________
- __________ Conservancy

Last Updated 4/25/2016

Draft Environmental Impact Report: Notice of Preparation & Initial Study

What potential environmental impacts should we consider as we prepare the draft Environmental Impact Report on the Air District's 2016 Clean Air Plan/Regional Climate Protection Strategy?

All On Forum Statements sorted chronologically

As of June 22, 2016, 8:04 AM

BAY AREA AIR QUALITY MANAGEMENT DISTRICT

Open Air Forum is not a certified voting system or ballot box. As with any public comment process, participation in Open Air Forum is voluntary. The statements in this record are not necessarily representative of the whole population, nor do they reflect the opinions of any government agency or elected officials.

Draft Environmental Impact Report: Notice of Preparation & Initial Study

What potential environmental impacts should we consider as we prepare the draft Environmental Impact Report on the Air District's 2016 Clean Air Plan/Regional Climate Protection Strategy?

As of June 22, 2016, 8:04 AM, this forum had:

Attendees:	13
On Forum Statements:	1
Minutes of Public Comment:	3

This topic started on June 21, 2016, 2:13 PM.

Mike Vandeman — June 21, 2016, 8:19 PM

You should ban wood burning at all times, not just on Spare the Air days, if not done cleanly.

Josh Pollak

From: Hartmut Wiesenthal <hartmut_uwe@hotmail.com>
Sent: Tuesday, June 28, 2016 2:50 PM
To: Josh Pollak
Subject: Open Air Forum - PEIR on the AIR Districts 2016 Clean Air Plan

To: Josh Pollak
jpollak@baaqmd.gov

Hi Josh,

here are my inputs/comments/suggestions:

1) wood burning fire places should be prohibited and must be replaced with gas fire places, especially in homes, which only of a wood buring fire place.

2) delivery trucks (e.g. UPS) and service trucks (e.g. Waste Management) should be upgraded from diesel to CNG or LNG.
Waste Management / Republic Services (waste management) already did this with part (18%) of their fleet, but not here in the Bay Area.
UPS already switched part of thier delivery fleet to natural gas, but not here in the Bay Area.

Kind regards,
Hartmut Wiesenthal
3600 Braxton Common
Fremont, CA 94538

From: DSchoenholz@fremont.gov
To: hartmut_uwe@hotmail.com
CC: FDiaz@fremont.gov
Subject: Request to upgrade diesel trucks/busses to cleaner fuels as LNG
Date: Fri, 4 Mar 2016 23:21:11 +0000

Dear Mr. Wiesenthal:

This is in response to your e-mail to the City of Fremont regarding the use of natural gas vehicles. As you describe in your e-mail, natural gas vehicles have lower emissions of greenhouse gases and other pollutants than conventional vehicles. The City currently has seven CNG vehicles (two sedans and five street sweepers) in our fleet. Our experience has not been entirely positive: all the vehicles have actually required much higher levels of maintenance than other vehicles in our fleet. We have also invested in hybrid vehicles and 100%

electric vehicles in order to reduce emissions. We anticipate continuing and expanding our purchase of alternative-fuel vehicles in the future.

In response to the specific requests in your e-mail regarding natural gas vehicles:

--With respect to our solid waste vendor, the City does intend to negotiate a commitment to alternative-fuel collection vehicles in our next solid waste contract when it comes up for renewal in 2018/2019.

--For our own fleet, as I mentioned, we have utilized CNG vehicles in the past and have experience significant maintenance issues. We will continue to evaluate CNGs against other technologies including hybrids and 100% electrics as we consider future purchases.

--While we don't dictate the types of vehicles that private companies within Fremont use in their fleets, we do encourage our businesses to look for ways to reduce ghg emissions.

--With respect to buses, AC Transit has its own program to evaluate alternative fuel vehicles. While we are not in a position to dictate the technology AC Transit uses, we support their efforts to move to alternative fuel buses.

If you have further questions regarding the City's Climate Action Plan or programs related to alternative fuel vehicles, please feel free to contact me at (510) 494-4438.

Regards,

Dan Schoenholz
Deputy Community Development Director

----- Original Message ------
From: "Hartmut Wiesenthal" <hartmut_uwe@hotmail.com>
To: "environment@fremont.gov" <environment@fremont.gov>; "bharrison@fremont.gov" <bharrison@fremont.gov>; "lmei@fremont.gov" <lmei@fremont.gov>; "schan@fremont.gov" <schan@fremont.gov>; "vbacon@fremont.gov" <vbacon@fremont.gov>; "rljones@fremont.gov" <rljones@fremont.gov>; "rdifranco@fremont.gov" <rdifranco@fremont.gov>; suzannelchan@gmail.com; suzannelchan2@gmail.com
Sent: 2/27/2016 1:09:03 PM
Subject: Request to upgrade diesel trucks/busses to cleaner fuels as LNG

Dear Major Bill Harrison,
Dear City Council,
Dear Environmental Department,
Dear Sustainability Coordinator Rachel DiFranco,

Subject: Upgrade diesel trucks/busses, which are serving Fremont, to cleaner fuels as LNG (liquefied natural gas)

1) Fremont Green Challenge is the City's greenhouse gas reduction and sustainable community initiative.

2) Emissions from LNG (natural gas) powered trucks/busses are much cleaner, with lower emissions of carbon and lower particulate emissions per equivalent distance traveled. They are also much quieter.
LNG – and especially CNG – tends to corrode and wear the parts of an engine less rapidly than gasoline. Thus it's quite common to find diesel-engine NGVs (natural gas vehicles) with high mileages (over 500,000 miles).

3) Diesel engines for heavy trucks and busses can also be converted and can be dedicated with the addition of new heads containing spark ignition systems, or can be run on a blend of diesel and natural gas, with the primary fuel being natural gas and a small amount of diesel fuel being used as an ignition source.

4) LNG is on its way of becoming a mainstream fuel for transportation needs.
Lowe's finished converting one of its dedicated fleets to LNG fueled trucks in 2013.
UPS had over 1200 LNG fueled trucks on the roads in Feb 2015.
The NGV (natural gas vehicle) fleet is made up mostly of transit buses, but there are also some government fleet cars and vans, as well as increasing number of corporate trucks replacing diesel versions, most notably Waste Management, Inc and UPS trucks.
UPS is building its own private LNG fuel center despite the availability of retail LNG capability. UPS states they need their own LNG fueling capacity to avoid the lines at a retail fuel center.
As of 12-Dec-2013 Waste Management / Republic Services had a fleet of 2000 CNG Collection trucks.
I add below the article regarding Republic Services upgrading their trucks.

5) Why is China the leader, and Fremont hasn't taken any action ?
China has been a leader in the use of LNG vehicles with over 100,000 LNG powered vehicles on the road as of Sept 2014.

6) A filling / refueling station would be required, which could require support from the City of Fremont.

Request:
1) Could the City of Fremont negotiate with Republic Services (Waste Management) to upgrade their trucks, which are running in Fremont, to LNG ?

2) Could the City of Fremont negotiate with UPS to upgrade their trucks, which are running in Fremont, to LNG ?

3) Could the City of Fremont upgrade their own trucks to LNG ?

4) Could the City of Fremont negotiate with other companies, running trucks daily through Fremont, as Fedex, to upgrade their trucks to LNG ?
5) Could the City of Fremont negotiate with AC transit to upgrade their busses, which running through Fremont, to LNG ?
AC transit launched a program in October 2007, to test two other fuels: Biodiesel and GTL (Gas-to-Liquids) Diesel as a Cleaner Fuels Test Program. AC transit should switch to LNG.

Kind regards,
Hartmut Wiesenthal

3600 Braxton Common
Fremont, CA 94538

Pasted from <http://portlandtribune.com/wsp/134-news/277583-153063-republic-upgrades-to-natural-gas-powered-trucks>

Republic upgrades to natural gas-powered trucks

There is a story that Republic Services points to when asked about the benefits of powering its waste collection vehicles with compressed natural gas (CNG).

According to the story, the former mayor of Bellevue, Washington, wouldn't set an alarm to wake him in the morning. Instead, he'd rely on the rumbling of one of Republic's diesel-powered garbage collection trucks.

But the morning after the company rolled out its quieter CNG vehicles in Bellevue, the mayor overslept.

"I don't think there are a huge amount of complaints about seeing a truck drive through neighborhoods," says Jennifer Eldridge, senior communications manager with Republic Services. "But we all know it's there when a FedEx or a UPS truck goes by."

Wilsonville residents can look forward to a similar change in the months to come, as Republic Services' Wilsonville campus acquires a new CNG fueling station that will eventually power its whole fleet of collection trucks. The $5 million upgrade was approved by the City of Wilsonville's Development Review Board Sept. 14, and should start to fuel vehicles beginning in the spring of next year.

Republic Services is one of the largest waste collection companies in the United States. The Wilsonville transfer station is a MRF — a "materials recovery facility" — where the garbage and recycling collected by Republic's fleet of local trucks is processed to ensure that all waste has been properly sorted. Afterward, the garbage is sent to a regional landfill, while the recycling is taken elsewhere for re-sale.

The Wilsonville station serves Wilsonville, West Linn, Sherwood, Tualatin, Lake Oswego, Oregon City and parts of Portland. It has grown in the last decade with the consolidation of smaller stations around the area.

"Within the last few years, we've been focusing on making Wilsonville the hub for our metro-area operations," says Jason Jordan, general manager of the Wilsonville station.

A big part of the consolidation process was the construction of a new maintenance shop. Completed last year, the shop meant that Republic's vehicles no longer had to travel to Sherwood for service.

Republic Services workers sort through recyclable material on a conveyor belt to determine what is sent on for re-use and what is sent to a landfill. Its a fast-paced process that demands endurance.

The shop was also built with an eventual shift to compressed natural gas vehicles in mind, including a CNG ventilation system, gas detection systems, modifications to lighting and other additions.

"This is something that has been part of our sustainability commitment for a couple of years," Eldridge says.

Sustainability, Eldridge says, is foremost the reason for the shift to CNG vehicles, but in addition to being quiet, it supports North American natural gas suppliers (like NW Natural, which will supply gas for the Wilsonville station).

Among the more significant components that will be added with the CNG upgrade will be dryers and compressors that turn natural gas from a line into a fuel capable of powering a collection truck. Gas then flows via a timing device through a line attached to a vehicle, generally over the course of five or six hours. Because of the length of time it takes to fill the vehicles, refueling generally occurs overnight.

That means that the filling process will actually be more convenient for drivers with diesel-powered vehicles, says Brian May, municipal relations manager for the Wilsonville station.

"A driver normally fills their (diesel) vehicle at the end of their shift, and it takes 15 or 20 minutes. Now it will be basically pulling into your parking spot and walking away," he says.

Although the range traveled by a truck from the Wilsonville station varies greatly on account of the broad area the station services, Jordan says that a night of fueling will be plenty to get even trucks with the longest of routes through the day.

“What is nice out of the Wilsonville campus is that it’s really a great centralized hub. It allows us to service our customer base in this community really in a one-shot, out-and-back way,” he says.

Sixteen compressed natural gas-powered collection vehicles are slated to be delivered to the Wilsonville station by the end of this year, each of which costs around $30,000 more than a diesel-powered vehicle, Eldridge says. The vehicles will have to wait until the spring of 2016 for the fueling station to be built, however.

Initially, the station will be capable of fueling 30 vehicles at once. But it will receive upgrades that will eventually allow it to support 58 vehicles, which, Jordan says, would supply the station’s entire collection fleet.

Pasted from <http://portlandtribune.com/wsp/134-news/277583-153063-republic-upgrades-to-natural-gas-powered-trucks>

California Council for Environmental and Economic Balance
101 Mission Street, Suite 1440, San Francisco, California 94105
415-512-7890 phone, 415-512-7897 fax, www.cceeb.org

July 5, 2016

Christy Riviere
Principal Environmental Planner
Bay Area Air Quality Management District
Submitted via email to criviere@baaqmd.gov

Josh Pollak
Environmental Planner
Bay Area Air Quality Management District
Submitted via email to jpollak@baaqmd.gov

RE: 2016 Clean Air Plan, Draft Control Measures -and-
CAP Notice of Preparation and Initial Study

Dear Ms. Riviere and Mr. Pollak,

On behalf of the members of the California Council for Environmental and Economic Balance (CCEEB), please accept our initial comments on the 2016 Clean Air Plan (CAP) draft control measures and the NOP and Initial Study. CCEEB is a coalition of business, labor, and public leaders that advances strategies for a sound economy and a healthy environment. We have many members that operate facilities in the air basin. Additionally, CCEEB represents a large number of sources statewide regulated by the Air Resources Board for greenhouse gas emissions, and has played an active and ongoing role in developing state GHG laws and programs.

At this time, CCEEB will refrain from providing comments on the individual control measures; we would like to see background information and the draft CAP before doing so. Our comments instead focus on process issues related to development of the plan and environmental impact review.

Our main comments on the draft control measures are as follows:

- **Incomplete information and analysis:** additional background is needed to fully evaluate individual draft control measures and the plan as a whole.
- **Lack of consistency across control measures**: control measures use different scopes and metrics, which make comparison and prioritization challenging.
- **Process and schedule**: what is the schedule and process for developing the CAP? How will staff work with stakeholders to refine draft control measures?

We have one additional comment on the Notice of Preparation:

- **Conflicts with State GHG Programs are Possible and Likely Significant**: this needs to be analyzed as part of the District's CEQA review.

What follows is further discussion of these points.

Provide Missing Information and Background Analysis

CCEEB would like to see information on estimated regional GHG emissions, as well as details describing how the District calculated current and projected future emissions. At the April 13, 2016 meeting of the Energy and Stationary Sources Working Group, staff committed to providing this information in a technical document, but has not done so at this time. In particular, CCEEB would like to understand the assumptions used for GHG projections out to 2050. CCEEB also asks staff to prepare a chart or table that shows projections as total emissions (mass) rather than percent relative to 1990. This background is important given that nearly one-quarter of all measures target only GHGs, and another 41 percent target GHGs with other pollutants; taken together, about two-thirds of the CAP seems to be geared towards achieving the District's climate change goals rather than meeting ozone or PM standards.

CCEEB would like to see the socio-economic analysis for the draft control measures and asks staff to make clear when this will be publicly available.

CCEEB would like to see the results of the District's multi-pollutant evaluation methodology (MPEM) analysis. We also ask staff to report on any changes to the MPEM since its release in 2010.

Finally, emissions for many measures have not yet been quantified. We would appreciate if staff would make clear which estimates will be completed as part of the CAP development ("TBD"), which will not be quantified until rulemaking or implementation, and which will not be quantified at all or where no reductions are expected. Language throughout the CAP should be consistent on this subject.

Provide consistent information on emission reductions and costs

Some measures estimate emission as "tons per day" reduced, and others estimate "tons per year." CCEEB strongly recommends that criteria pollutants be listed using TPD and that GHG be listed using TPY of CO_2e. For measures that leverage or build upon activities at other agencies, the District should calculate what additional reductions it expects to achieve beyond those being attributed to outside (i.e., non-District) efforts, to the extent that such additional reductions can be estimated.

For costs, staff mix-and-match what information is provided; at times, staff estimate costs to the District, other times costs to sister agencies, and in still other instances, staff list compliance costs to regulated entities. While all three data types are useful, CCEEB recommends that staff estimate District costs for *every* measure (as well as the likely funding source); compliance costs for all proposed or amended rules, to the extent this information is available; and costs to sister agencies, to the extent this information is available. Costs should be stated as annual costs or otherwise clearly noted.

Clarify CAP Development Process and Work Schedule

It is unclear to us when the draft plan and background analyses will be available, when workshops will be scheduled, and when staff expect to bring the CAP to the Board for approval. It is also unclear whether the sector-specific working groups will be reconvened. We'd appreciate having the process and schedule explained, as well as details on how staff will work with stakeholders to refine proposed control measures.

CCEEB also sees a need for greater clarity on how the District will approach GHG control strategies, particularly given recent Board direction to staff. For example, Stationary Source Measure 11 seems to refer to Proposed Rule 12-16, which applies solely to refineries. As such, other regulated entities have not been part of the process, nor has staff reached out to non-refinery stationary sources of GHGs as part of its rulemaking. However, as indicated in SSM 11, the District's ultimate approach "…may inform similar analyses and control strategies applicable at other combustion sources." The options put fort in SSM 11 are significant and highly controversial. If the District plans to use any of these approaches for other sources, then CCEEB strongly urges staff to broaden its outreach efforts to all potentially affected sources. Staff should also update the discussion of SSM 11—and any other relevant control measures—to indicate how Board direction on PR 12-16 could affect the CAP and District climate policies.

Finally, we wish to comment on the Open Air Forum. We appreciate staff looking for new ways to present information and enhance public participation. However, many found the online portal difficult to navigate, especially for viewing all sectors. We appreciate that staff more recently posted a PDF file consolidating all control measures into a single document, and hope that staff in the future similarly supplement the Open Air Forum with standard file types and formats.

CEQA Review Needs to Analyze Potential Conflicts with State GHG Programs

Regarding the recent NOP, CCEEB believes that the District must assess potential conflicts between the draft control measures and state GHG programs. Depending on how these measures are designed and implemented, we see potential for significant impacts. The types of conflict fall into two general areas: first, some GHG measures could conflict with similar efforts at state agencies; second, some measures that affect District permit programs could impede facility upgrades and other projects needed to comply with state mandates. Concern over the potential for such conflicts has been well documented throughout development of Proposed Rule 12-16 and, to a lesser degree, through public comments on amended Rule 2-2. The Board's own Advisory Council has discussed possible challenges to state efforts from Rule 12-16, and ARB Executive

Officer Corey has expressed concerns to the District's Board on multiple occasions. We think this warrants analysis in the environmental impact review.

Thank you for considering the comments of CCEEB and its members. Please contact me at (415) 512-7890 ext. 115 of billq@cceeb.org should you wish to discuss any of these items further. We look forward to seeing the draft CAP and background analyses.

Sincerely,

Bill Quinn
CCEEB Chief Operating Officer and Bay Area Partnership Project Manager

cc: Henry Hilken, BAAQMD Director of Planning and Climate Protection
Gerald D. Secundy, CCEEB President
Kendra Daijogo, CCEEB Climate Change Project Manager
Janet Whittick, CCEEB Policy Director

Comments To The BAAQMD
On Certain Control Measures Within Their Climate Protection Strategy

Bill Martin, President, California Geothermal Heat Pump Association
July 5,2016.

The following is offered in advance of the Open Air Forum scheduled for July 14th at the Bay Area Air Quality Management District's Beale Street headquarters. I am in favor of all of the control measures I feature below and wish to elaborate on the reasons why geothermal heat pumps can help.

CONTROL MEASURES:

SS-16 **GHG BACT Threshold** *Control of greenhouse gas emissions*
The use of geothermal heat pumps as retrofits or initially in new buildings can reduce or eliminate methane combustion on-site for heating of space and hot water. This boosts the amount of building energy that is consumed from an on-site renewable resource. In larger buildings where the cooling load is dominant, all the hot water might come from the geothermal heat pump (GHP) system. Since 33% of California's grid power will be renewably generated by 2020 and 50% by 2030, More of the energy to run a GHP system will itself be carbonless. If on-site solar PV is incorporated, the renewable electricity fraction of a building's needs will be reached sooner.

SS-28 **Residential Fan Furnaces** *Reduce NOx emission limits on equipment*
Fossil-fired furnaces (or boilers) can be replaced by geothermal heat pumps in buildings of any size or climate zone. This will reduce the proportion of non-renewable carbon-based energy *imported* to the site and increase the proportion of renewable thermal energy *from* the site to serve the building. For residential and small commercial HVAC systems, geo heat pumps eliminate the conventional, separate air conditioning system on common duct work because (when necessary) a heat pump uses a refrigerant reversing valve to *shift functions* from thermal import to thermal export.

BL-1 **Green Buildings** *Upgrades to schools, etc. with renewable systems*
Green building for any new or retrofit project begins with appropriate Title-24-style boosts to the integrity of the building's thermal envelope. After that is accomplished, deployments of smaller sized HVAC equipment is possible. Ground heat exchange loops are then more easily located on school and commercial properties, using less space.

When renewable thermal resources are available at no operating cost under and around such buildings, it makes little sense to saddle such publicly-funded, long-lived building use to the consumption of fossil fuels.

BL-2 **Decarbonize Buildings** *Rules to limit sale/use of fossil fuel HVAC*
Retrofits of larger commercial or multi-residential buildings will continue to be a greater challenge and cost than "from scratch" construction. But, such buildings represent the largest potential GHG reduction opportunity available, nationwide.

The challenge to the utilization of geo heat pumps is the location of ground loop heat exchangers which are appearing in an increased **assortment of deployments** that connect with the earth, so it can become a thermal battery. But we must install the "cabling" represented by circulating fluid in buried pipes to make this miracle possible. Larger buildings provide an opportunity for unitary heat pumps on a common loop. In that configuration, heating and cooling can operate independently and simultaneously within the many spaces. This results in the cooling of one space boosting the temperature of a space requiring heating. The use of this particular loop deployment can increase thermal efficiency by up to 30%. Dual loops on dual compressors can improve efficiency in large buildings by more than 50% over small systems.

BL-3 **Market Solutions** *Innovation for viable solutions for GHG reduction*

As effective and appropriate as GHPs are, they are still dogged by the first-cost phenomenon that tilts attention toward lower initial cost conventional technology that consumes (carbon-based) non-renewable resources. There are two prescriptions that could treat this malaise. One is the celebration and inclusion of Life Cycle Cost metrics into project requirements and specifications. The other is an increase in available green funding such as Property Assessed Clean Energy (PACE), utility participation, and consumer marketing to interest people in the life cycle GHG savings through lowered operating costs.

An electric utility tariff favoring geo heat pumps (GHPs) could help sell this technology to heretofore reluctant investor-owned utilities. It could be justified because of GHP's lower electrical cooling demand by 700 watts per ton compared to standard air conditioners (A/C) or air-source heat pumps (ASHPs). When they are running for heating, GHPs can make hot water at 5-to-8 times the efficiency of electrical resistance water heaters. While cooling, that hot water is a free byproduct of the cooling cycle.

Investor-owned electric utilities could also begin a ground loop lease program that could lower the installation cost barrier to consumers and would increase the ground loop installation workforce, thereby driving the amortized cost of drilling and related equipment downward for every new ton of capacity installed. This has already been in place for a number of rural electric Co-ops across the nation, beginning in Portola, California (Plumas County). These financial incentives can coax the market away from fossil fuels while lowering summer demand on the electric grid.

BL-4 **Heat Island Mitigation** *Cool roofs, parking lots, and streets* **[exception]**

There's nothing wrong with cooler surfaces during summertime but the exception marker above refers to an unrecognized mitigation in two ways via GHPs.

Standard A/C requires fan-driven outside condensers that make noise and discharge a building's unwanted heat into the neighborhood, raising that temperature and warming the outside skin of all buildings. A warmer heat island is thus a compromised heat sink for air-based cooling equipment.

In larger commercial buildings, cooling towers are often the means of making chilled water for interior cooling. These devices use double the electrical demand of GHPs per ton of capacity while consuming thousands-to-millions of gallons of water per year, increasing the micro-climatic humidity. Extra humidity within interior spaces reduces the efficiency of cooling equipment. Cooling towers also produce liquid mineral waste that is not qualified for discharge into a wastewater collection system without specialized on-site treatment beforehand.

GHPs can eliminate both of these contributions to the “heat island” effect by discharging unwanted heat into hot water production and underground, where a bit of a flywheel effect raises the temperature of the formation by the fall season. This boosts the GHP’s efficiency at the beginning of the heating season. The results are reversed in early summer cooling after the formation served by the ground loop is cooler from heat extraction (and thus more efficient at the beginning of the cooling season).

GHPs can cool without consuming water and they post stunning efficiency because they discharge waste heat into underground storage whose temperature is 55-70°F instead of trying to discharge it into air at 95° or more. The equipment has double the life of standard A/C or ASHP equipment and has been known to run without replacement in residential applications for over 35-years. With a demand reduction of 700 watts per cooling ton compared to air-sourced cooling, GHPs lower the necessary contribution of thermal power plants feeding the grid, each one of those evaporating millions of gallons of water for their steam condensing function.

EN-1 **Decarbonize Electricity** *Maximize renewable electric energy* **[exception]**
This control measure is also flagged with an exception, not because GHPs *produce* electrical power, but because they *conserve* it while cooling as mentioned in BL-4, and for one other reason. California is heading for the fulfillment of a requirement that all new residential buildings be Zero Net Energy (ZNE) by 2020, and commercial buildings not far afterward. If the roll-out of this policy follows the common ZNE definition used in the rest of the nation, all energy will have to be generated on the building site, averaged over an entire year, without carbon.

A GHP system would require far fewer solar PV panels to achieve this target than ASHPs would to hit this ZNE goal. And with all this generation during the summer cooling season, such a building would likely carry the cooling load by itself with no net draw on the grid during hot daytime. Housing and buildings thus situated could help stop any increase in peak grid demand during summer. Accelerated retrofits of existing buildings with GHPs (and even better if a solar PV installation is added) could represent the low hanging fruit of extended grid life with less newly-constructed capacity becoming necessary.

EN-2 **Decrease Electricity Demand** *Additional EE policies and programs*
The contribution of GHPs to demand reduction were covered in the previous two entries. However, I will add that the adoption of new promotions and of improved consumer education to reduce demand can be aided in additional ways.

Electrical utilities should receive rate relief for installing grid battery storage in strategic locations of their choice. They should be permitted to charge “wheeling” and demand charge rates for consumers who “go ZNE,” as long as such rates recognize local net metered summer electricity export as a benefit countering such rate elements. Electric utilities should also join a public agency partnership to promote the kinds of consumer use patterns that will ease pressure on the grid and its base load and intermittent generating facilities.

A stronger celebration of *carbonless* zero net energy homes and buildings should be embraced by all public agencies and the electric utilities in a partnership that will accelerate their construction. A renewable, all-electric economy could soon be within reach. For example, here is a link to the Quincy, California carbonless **Zero Net Energy Home**

SSV Feedback on Open Air Forum 2016

This is Sustainable Silicon Valley's feedback on BAAQMD Open Air Forum 2016. Specifically, we commented on the Transportation, Buildings, Energy, and Water sections, plus added our thoughts on Carbon Capture.

Transportation

SSV Comments:

" SSV is pleased to see that the transportation sector is identified as one of the main items that need to be addressed to improve the air quality in the Bay Area. A number of actions are put forward to facilitate public transportation, promote alternative commuting and increase safety for everyone on the road.

The focus on outreach and better education of commuters and youth will significantly increase the acceptance of the necessity to move away from traditional road behavior. And will lead to a natural behavioral change in the commuter generation to come.

The planned expansion and more eco-friendly alterations of the public transportation system, such as the electrification of the Caltrain system, will have a significant impact. SSV identifies the timeline of the implementation as critical.

SSV supports the Bay Area Bike Share Pilot Program and encourages the inclusion of more e-biking options, and expanding the bike sharing and e-bike charging stations along transit hubs and campuses.

BAAQMD identified the necessity to enhance the network of safer bike and pedestrian routes. Enhancing the bike path-network will increase acceptance of biking as a way to get to and from work and not only as a last mile option. Separation of bike paths and streets will as well have a positive impact on the daily school transportation."

Building

Usage / Decarbonize Buildings

SSV has the long term vision of a Net Positive Bay Area in 2050 for Water, Carbon, and Energy. Our immediate step on this path is to bring sustainability to the disadvantaged community of East Palo Alto. This work is funded by BAAQMD to do 25 home energy and water audits in East Palo Alto. We expect 3 outcomes from this work:

1. It is challenging to recruit homeowners for energy audits. We are working to determine best practices for getting audit candidates.

2. We will review the status of what is in EPA homes so we get a better idea of the housing stock.
3. We should then be able to look at possible solutions and their effectiveness especially in light of the requirement within SB 350 to get to housing that is 50% more efficient in 2030 than it is now. We need to determine how to craft solutions that are financially viable for building owners and lead to goals for decarbonization in ordinances and legislation such as SB 350.

To that end, the ideas suggested to Decarbonize existing buildings are on target. We will need to understand what programs will be in place to aid in this transition. One example is make sure stores have new, economical water heaters in stock in their stores to replace old water heaters when they fail as the homeowner needs a replacement quickly. Having the correct choice on hand so that it can be replaced will help ensure more efficient water heaters are in use.

The pathway to a carbon free environment has three components:
1. Power everything electrically including production of energy sources that are chemical (e.g. Hydrogen).
2. Source all electricity from renewable sources
3. Make all electrical devices as efficient as possible.

This means transitioning to electrical water heaters and heat pumps for the home. One challenge is that the per unit of energy (BTU, Therm or kWh), gas is cheaper than electricity. We need to determine how to equalize this so we do not cause financial distress when moving to the all electric environment in the future.

There is a linkage between buildings, energy and transportation, which is providing a residential charging infrastructure for electric vehicles. This becomes very key in multi residence buildings. This involves building codes, ordinances, SB 350 and any financing vehicles required to make this happen. Currently 80% of charging is done at home. The degree to which we get this infrastructure in place will control how much public EV charging infrastructure is required. We do need more public EV charging infrastructure in place

In summary, the building sector has key links to transportation, energy, ordinances and legislation that will help to drive this to a more sustainable future. What is listed is important and necessary. We need to provide more detail and cross linkages over time.

We also need **measurable goals** tied to these ordinances so we know where we are on our pathway to a sustainable future. The CEC is in the process of putting together goals for SB 350 on a yearly basis to get to the goals in 2030. We need these milestones to ensure we get and stay on target.

Market based solutions should include:
1. Ensuring stocking levels of efficient electric replacements to gas heating devices.

2. Rebates and other financial incentives to have people transition
3. Determine how to address the cost difference between electricity and gas on a per unit of energy basis.

Energy

SSV Comments Energy

We do need to provide a way to cross correlate energy usage to its source as we move from petroleum fuels to electric vehicles. Electrical demand will increase while petroleum decreases.

Supporting CCA / CCEs will be key. Communities such as Cupertino, Mountain View and Sunnyvale are moving to a CCE called Silicon Valley Clean Energy (SVCE) to meet the goals in SB 350. SVCE came into being to make electricity more renewable. Cities like Mountain View are leading by example—they will likely take the 100% renewable option from SVCE

There is mention of research into new technologies like storage. What will BAAQMD be doing to address getting more research dollars? Petitioning CEC to do more Program Opportunity Notices (PONs) is a way to move things forward.

There are a number of worthy proposals here. Seeing these with more detail so that the cities can respond and be supported in their response will help drive efforts forward.

One challenge to be addressed is that the current cost of natural gas per unit of energy (BTU, Therm, kWh) is less expensive than electricity. We need to work through the transition to electricity. Also, we need to make energy efficiency at home cost effective.

We also need measurable goals to move to a sustainable future. They will act to tell us when we are on track and when we are not. When we are off track, we can determine what we need to do to get back on track.

Question:

What is included in cogeneration? Does it include gas fired generation plants with combined cycle?

Water

Sustainable Silicon Valley is pleased that the BAAQMD has identified onsite water reuse as an important step towards water conservation in the Bay Area. The measure WR2: Support Water Conservation, aims to reduce indirect greenhouse gas emissions from the transport and treatment of water and wastewater in the Bay Area. In this regard, the Air District will champion best practices and support local governments' efforts with respect to water use reduction.

Sustainable Silicon Valley understands that the Air District "does not have regulatory authority over water consumption and the resulting indirect GHG emissions" and can therefore only encourage reductions in water use with its Implementation Actions. However, we would like to see some measurable goals in this endeavor. For instance, to whom and how often will the Air District disseminate best practices to reduce water consumption and increase onsite water recycling in new and developing structures?

SSV also supports the Air District's goal to "[i]ncorporate best practices for water use into local plan guidance, CEQA guidance, and other resources for cities and counties", and looks forward to water conservation and reuse being a secondary focus of the Air District.

This measure supports SSV's mission of creating a Net Positive Bay Area by 2050, ensuring water resilience -- whose pillars are conservation, efficiency and reuse.

Carbon Capture ---Grasslands and Wetlands

All three approaches (grasslands, urban forest, wetlands) have advantages. The first addition to these plans would be the addition of some understanding of the extent of each activity, when a specific milestone in terms of the amount of carbon that will be sequestered. There should be references to established programs and initiatives so that these partnerships can be increased. Canopy is working to build the urban forest. There are a large number of organizations covering the SF Bay including Bay Keeper, Save the Bay, etc.

The programs all have multiple benefits that are not listed and may influence what the investment portfolio decisions would be for each step. Wetlands restoration has a number of significant benefits including:

- High level of sequestration based on any vegetation that is not eaten is buried in the mud.
- Habitat restoration and species protection
- Buffer against sea level rise
- Measure AA funding.

Funding for each of the steps should be listed so that the proper portfolio analysis can be done.

How are we doing on the existing swetlands preserves like the Don Edwards park? The one at Sears Point?

SANTA CLARA
Valley Transportation Authority

July 14, 2016

Bay Area Air Quality Management District
375 Beale Street, Suite 600
San Francisco, CA 94105

Attention: Josh Pollak

Subject: 2016 Clean Air Plan/Regional Climate Protection Strategy

Dear Mr. Pollak:

Santa Clara Valley Transportation Authority (VTA) staff have reviewed the NOP for the 2016 Clean Air Plan/Regional Climate Protection Strategy. We have the following comments..

Transportation Control Measures
VTA notes that the Air District's Transportation Control Measures from the most recent Clean Air Plan are included by reference in the "Deficiency Plan Action List" that VTA Member Agencies are required to consult when preparing a Multimodal Improvement Plan (previously "Deficiency Plan") per the requirements of the Santa Clara County Congestion Management Program (VTA *Deficiency Plan Requirements,* Table 4-1). VTA supports the updated Transportation Control Measures shown in Table 1-1 of the Initial Study (pgs. 1-9 to 1-11).

VTA notes that Measure TR-2, "Trip Reduction Programs," does not discuss establishing specific vehicle trip reduction targets or including periodic monitoring of trip generation upon project completion and an enforcement mechanism if the target is not met. VTA notes that these Transportation Demand Management (TDM) strategies have been employed successfully by several major development projects in Santa Clara County and elsewhere in the Bay Area. VTA encourages BAAQMD to include such measures in TR-2 or in an additional Transportation Control Measure.

Thank you for the opportunity to review this project. If you have any questions, please call me at (408) 321-5784.

3331 North First Street · San Jose, CA 95134-1906 · Administration 408.321.5555 · Customer Service 408.321.2300

Sincerely,

Roy Molseed
Senior Environmental Planner

cc: Patricia Maurice, Caltrans
Brian Ashurst, Caltrans

BAAQMD1601

16-7-14_EIR comments on BAAQMD's 2016 Clean Air Plan and Regional Climate Protection Strategy

By Mark Roest, residing in San Mateo, California 94403, writing and commenting for myself.

To the Board of Directors of the Bay Area Air Quality Management District:

In the context of making recommendations for the Draft Programmatic Environmental Impact Report being prepared for the 2016 Plan, the single most important point of leverage to maximize the potential contribution of the EIR process is the requirement for serious development and consideration of Alternative Scenarios. This testimony / commentary is focused on an approach designed to fully implement the intent of the CEQA process, that the Alternative Scenarios be truly meaningful opportunities to examine fully any solutions that might result in less negative environmental impact, and more positive environmental opportunities, than the Base Case affords.

In a context of escalating damage in nearly all major arenas from climate disruption caused by excessive use of fossil fuels, long after those extracting them recognized the science and chose to suppress it in the interest of their profits, the BAAQMD can no longer afford, or justify, the long-held position of its chief staff administrator, that aggressive regionally-based action to address climate change, to the extent of limiting and even damaging the economic interest of refineries and others is and will be fruitless because free riders in other parts of the State of California, and beyond, will take advantage of cost savings from not investing in equivalent measures, in the interest of some unarticulated benefits they might perceive.

Let's get real! The Governor and key leadership in the Senate and the Assembly, as well as the Air Resources Board, the CEC and, to a significant extent lately, the PUC, are all moving to put the squeeze on fossil fuels, and to mandate full compliance with environmental and safety requirements by nuclear power plants. They are, collectively, highly skilled administrators and hold great power, and today, the issue of other air districts possibly acting as free riders is an absurd red herring, and nothing more. Today we call it climate denial, and since the global agreements in Paris in December 2015, and further with the collapse of the major players in the coal industry and the ongoing global shakeout in oil, climate denial in regional politics is no longer just evil and ill-founded – it is also ludicrous.

In this profoundly changed political climate, combined with the technology that has been emerging and taking leadership of the energy industry, despite its very small starting point, there is no possible justification for allowing any growth whatsoever of the fossil fuel export industry. And exports are the sole reason, from an industry point of view, for expanding emissions through processing incredibly dirty shale and tar sands oils, which are severely constrained in their access to ocean shipping to less-regulated markets abroad – which we *do need to remind you* share the same atmosphere with us, having about a 1- to 2-week transit time for their criteria pollutants to cross the Pacific and reach us, along with their increases in the carbon dioxide load.

I say 'exports are the sole reason, from an industry point of view' because the truth is that gas consumption per vehicle and in many or most cases, overall, has been going down, under the twin pressures of 1) federal and State fuel economy and emissions mandates, and 2) the rapid growth of hybrid-electric vehicles, the more-rapid recent growth of 100% Battery Electric Vehicles (BEVs), and the opportunistic growth of Plug-in Hybrid Electric Vehicles (PHEVs) in the remaining time before batteries have so much capacity per kilogram and liter, and are so cheap, that no one will consider fuel anymore.

In many ways, the position of the oil companies today is parallel to that of the whaling fleet as petroleum started to be drilled all over Los Angeles. No observant investor would put a penny into whale oil rendering plant upgrades then, if they also knew that oil was also being discovered and developed on each of the other continents, so there was little likelihood of an export market, even as the national market faced extinction.

In addition to these truths, as a regional organization mandated by the State of California, BAAQMD staff leadership has no business working against the intention of state leadership, with the support of an overwhelming percentage of its citizens, to electrify and decarbonize the transportation fleet *ASAP*.

The following analysis is designed to fully, in the public record, and relying on CEQA-based requirements for fair and serious consideration, cause the CEQA process to bring forward for your approval our best and most comprehensive set of opportunities for BAAQMD action, collaboration, and leadership. Its findings are based on

- 50 years of research in whole systems design, beginning with R. Buckminster Fuller's lecture course on that subject at then-San Jose State College in the spring semester of 1966,
- 4 years of market research and analysis for a battery technology startup company,
- 2 years of participation in an organization devoted to fossil-fuel-to-battery conversions of (and new vehicle sales to) municipal and commercial fleets, and
- a few years as an activist with local teams of volunteers with 350.org.

The most effective way to cause the CEQA process to bring forward for your approval our best and most comprehensive set of BAAQMD opportunities, is to focus on CEQA's Alternative Scenarios requirements. The Advanced Energy Economy (AEE) model, the New York model, and the New England model should be fully studied for utilities, using input on current status and future expectations from industry trade associations (solar, wind, batteries, smart microgrid, demand management, energy efficiency), the Consumer Choice Aggregation / Energy agencies (CCA / CCE), Mark Jacobson of Stanford, other academics on this side from other universities, research and publishing companies & investment banks who have declared the end of coal and rapid coming switch to renewable energy & storage, and other organizations driving for the switch from fossil fuels and nuclear power to 100% renewable energy.

To successfully address provision for both the electricity grid and transportation, the alternative scenarios that need to be studied include:

1. Full and expedited implementation of all the plans for de-carbonizing California that are supported by the Governor and the new energy economy leaders of the State Assembly and Senate.

2. The radical possible scenario, based on:

2.1 performance to cost ratios expected within the next 2, 5, 10, 15 and 20 years by the most advanced developers of solar, wind, run-of-stream hydro, and waste biomass technologies, and by:

2.2.1. conventional transportation equipment providers who are fully committed to 100% Battery Electric Vehicles (BEVs), and

2.2.2. whole transportation system designers (such as the 60 designers, engineers and craft-people of Powers Design International), transportation niche and technology sector developers & manufacturers, and multifaceted distribution, service and finance channels such as Green Fleets Group, who have been completely re-conceptualizing and redesigning transportation for the 21st Century, including:

2.2.2.1. 100% BEV, Original Equipment Manufacturer (OEM)-made cars, trucks, buses, and off-road vehicles

2.2.2.2. bidirectional monorails and ultralight, streamlined group rapid transit vehicles powered by electricity from overhead solar photovoltaic canopies,

2.2.2.3. conversion kits (from aftermarket manufacturers and those OEMs who choose not to oppose this development) for every make and model of car, that small companies, their ownership and workers rooted in disadvantaged communities, can use to electrify much of the current fleet which is relatively light in weight and in good condition aside from the engine. This defers the centralized energy cost of manufacturing that number of new vehicles to a time (in 10 to 15 years – see 2.2) when it is possible to have a carbon-free grid providing all of the necessary power, and carbon-free or carbon-neutral process heat for making the metals and technical fibers necessary for fabrication. It also prevents the outbound flow of money and financial power from the community to both fossil fuel companies and outside manufacturers and their wealthy dealers. All that money except the small amount needed for electricity (from their own distributed generation, and from their local Community Choice Energy agency), and the moderate fraction of the purchase price for new vehicles needed for conversion kits (some parts from local manufacturers, others from Tier 1 and Tier 2 parts makers and self-selected OEMs, and batteries from regional manufacturers in most cases)

2.2.2.4. literally hundreds of battery technology development companies, some number of whom will succeed in dramatic fashion, rising to compete with Panasonic and LG Chem, today's top Li-ion suppliers, with capacity expected to range from 300 Watt-hours per kilogram to 900 Watt-hours per kilogram and prices ranging from $300 per kWh down to $100 per kWh by 2019, if not 2018. This will include stationary batteries as well as mobile batteries, because the coming technology breakthroughs will be applicable to both, the volume will be available, and the cost will be so competitive as to be irresistible.

2.3 the very high probability that the *Chasm Theory of Marketing* will come fully into play. We already crossed the Chasm around 2012, when the new generation from renewable energy surpassed that from fossil and nuclear fuels globally, and we (and the 'opinion leaders' who drive idea adoption in their sectors) are seeing 'strikes and spares' in the niche market 'bowling alleys'. As the next rounds of battery, solar PV and wind technologies increase performance and slash costs yet again, we will enter the fringes of the Tornado of Demand, and the companies with the best manufacturing technologies (or the best combinations of specific adaptations to user needs, at relatively low cost) will win the race to enter its full power and seize major market shares. At this point, the market caps (based on expected future profits) of fossil-fuel-based companies such as Chevron, and of the nuclear power industry as it is today, will collapse, as they are completely eclipsed and replaced by the newly fully-integrated renewable energy, battery storage, energy management, energy efficiency, hyper-car/truck?bus/off-road vehicle manufacturing, and building and vehicle rehabilitation industries.

Bay Area Air Quality Management District Comment Card

~ 2016 Clean Air Plan/Regional Climate Protection Strategy Comments ~

Persons wishing to submit written comments are encouraged to do so.

Name: Mary Frazier **Email Address:** mfrazier13@yahoo.com

Organization Represented: Northern California Breathmobile

Address:

City: Oakland **State:** CA **Zip:** 94607

PUBLIC COMMENT: EIR - make it clear that "Care Communities"

Please leave completed comment card at the sign-in desk or with an Air District staff person.
Written comments will be accepted until July 18, 2016.

Bay Area Air Quality Management District Comment Card

~ 2016 Clean Air Plan/Regional Climate Protection Strategy Comments ~

Persons wishing to submit written comments are encouraged to do so.

Name: RICH WALTER **Email Address:** RICH.WALTER@icf.com

Organization Represented: NONE / INDIVIDUAL

Address: 620 FOLSOM ST., #200

City: SAN FRANCISCO **State:** CA **Zip:** 94107

PUBLIC COMMENT:

(A) CONSIDER ALTERNATIVES IN EIR:

(1) PRIORITIZE MARKET-BASED APPROACHES:
CARBON TAX, CAP/TRADE, OFFSETS

(2) PRIORITIZE COST EFFECTIVE MEASURES USING FIXED
$/TON (Example Measures <$xxx/ton OR
MEASURES COSTING LESS THAN SOCIAL COST
OF CARBON!

Please leave completed comment card at the sign-in desk or with an Air District staff person.
Written comments will be accepted until July 18, 2016.

SEE BACK

(B) IN EIR, CONSIDER FOLLOWING POTENTIAL SECONDARY ENVIRONMENTAL IMPACTS:

(1) SOLAR SUPPORT: AESTHETICS, LIGHT/GLARE

(2) TOD/INFILL/FOCUSED GROWTH:
FOR IMPACT OF LOCALIZED TRAFFIC, USE THE SB743 APPROACH OF VMT, NOT LOS (LEVEL OF SERVICE)

(3) METHANE GAS DIGESTERS FOR DAIRIES:
CONSIDER WATER QUALITY IMPACTS OF CONCENTRATED MANURE COLLECTION VS. ORGANIC DAIRY APPROACHES OF ~~I~~ INCREASED PASTURE FEEDING (WHICH ALSO LOWERS METHANE PRODUCTION).

(4) ~~SE~~ NEW FACILITIES (COMPOST, RECYCLING, TRANSIT, ~~SE~~ RENEWABLE ENERGY: SOLAR/WIND, ETC.) ETC.):
POTENTIAL SPECIES HABITAT & FARMLAND IMPACTS.

San Francisco Bay Conservation and Development Commission
455 Golden Gate Avenue, Suite 10600, San Francisco, California 94102 tel 415 352 3600 fax 415 352 3606

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BAY AREA AIR QUALITY MANAGEMENT DISTRICT

July 15, 2016

Josh Pollak
Bay Area Air Quality Management District
375 Beale St, Suite 600
San Francisco, CA 94105

SUBJECT: 2016 Clean Air Plan/Regional Climate Protection Strategy (SCH #2016062046)

Dear Mr. Pollak:

Thank you for the opportunity to comment on the Notice of Preparation for the 2016 Clean Air Plan/Regional Climate Protection Strategy (NOP) dated June 17, 2016 and received in our office on June 20, 2016. The Commission has not reviewed the NOP, however the following staff comments are based on staff review of the NOP for consistency with the McAteer---Petris Act and the policies of the San Francisco Bay Plan (Bay Plan), and the federal Coastal Zone Management Act (CZMA).

As a partner regional agency, the Commission has participated in the Open House public outreach series. Proposed pollution control measures minimizing point source, transportation, and land---use related emissions support the Commission's mission to protect and enhance the San Francisco Bay. Implementation of socially equitable pollution control measures to reduce air pollution and protect public health while minimizing impacts to Bay resources would provide multiple benefits to the Bay Area as a region and improve the global climate. Any actual pollution reduction projects within the Commission's jurisdiction may require permits for construction and installation, depending upon the location and nature of the activity.

Please note that in the NOP introduction the "Bay Area Conservation and Development Commission" is listed (page 1---1), the correct name is the San Francisco Bay Conservation and Development Commission (BCDC).

info@bcdc.ca.gov I www.bcdc.ca.gov
State of California I Edmund G. Brown, Jr. — Governor

The Commission looks forward to continuing to participate and support the 2016 Clean Air Plan/Regional Climate Protection Strategy. If you have any questions regarding this letter please do not hesitate to contact me by phone at (415) 352---3626 or email isaac.pearlman@bcdc.ca.gov.

Sincerely,

Isaac Pearlman

ISAAC PEARLMAN
Coastal Program Analyst

IP/cj

StopWaste
at home • at work • at school

July 15, 2016

Mr. Josh Pollak
Environmental Planner
Bay Area Air Quality Management District
375 Beale Street, Suite 600
San Francisco, CA 94105

Dear Mr Pollak,

We are pleased to submit the following comments on the notice of preparation and Initial study for preparation of the Draft Programmatic Environmental Impact Report for the 2016 Clean Air Plan/Regional Climate Protection Strategy.

In general, we strongly support the measures, implementation actions, and intent of the measures. We invite ongoing collaboration with the Air District to work together toward our common goals.

StopWaste currently leads initiatives in the waste, water, and buildings/energy sectors in Alameda County and the Bay Area region. These comments have been compiled by staff across our program areas that are well versed in their respective sectors.

Please feel free to reach out for clarification and follow-up dialog with the relevant staff. Our first point of contact on these comments would be Debra Kaufman. She can be reached at (510) 891-6519. We look forward to combining our efforts to maximize our collective impact.

Sincerely,

Wendy Sommer

Wendy Sommer
Executive Director

1537 Webster Street
Oakland, CA 94612

p 510-891-6500
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www.stopwaste.org

BL1: Green Buildings

1. StopWaste supports the draft implementation actions and encourage the Air District to leverage local government coordination activities happening across the region through entities like StopWaste' s Energy Council Technical Advisory Group. Collaboration will allow our public agencies to maximize impact with limited public resources, and will allow agencies to learn from each other's experience.
2. StopWaste encourages Air District collaboration with existing energy efficiency programs such as those offered by BayREN. The Air District has the opportunity to supplement these programs in ways that specifically allow them to overcome restrictions that apply to certain funding sources such as utility ratepayer funding.
3. When estimating GHG emissions reduction impacts, we encourage the Air District to use conservative assumptions. The text references participation rates in local climate action plans, some of which may have been overly optimistic. Also when estimating impacts, consider the potential interactivity between control measures BL1, BL2, and BL4, and also BL3, EN1, and EN2 when they are quantified.

BL2: Decarbonize Buildings

4. StopWaste supports this control measure because it is a critical component to reaching deep GHG reductions. We recommend an approach that is flexible about the types of low-carbon technology and allows for a diversity of technologies to apply depending on situational appropriateness. For example the implementation action regarding CEQA guidelines for commercial and multifamily developments could list a broader set of possible technologies. We also recommend adding solar thermal for space heating in the list of technologies discussed.
5. StopWaste encourages the Air District to think of these specific low/zero-carbon technologies as a piece of an integrated approach to whole building energy efficiency. For example, the implementation action for exploring incentives should be coordinated with energy efficiency incentives to maximize overall impact.
6. StopWaste recommends adding an implementation action to advocate for state regulation updates and changes to encourage low/zero-carbon technologies. This may mean encouraging the CPUC and CEC to update their rules for allowing these technologies and discouraging or limiting fossil fueled equipment.
7. Under emissions reduction trade-offs, it should be noted that in order to address the potential increase in emissions from electricity generation sites, BL2 and EN1 should be implemented closely in tandem.
8. Under issues/impediments, some analyses conclude that increasing overall electrical load may require upgrades to main electrical panels, which significantly increase project costs.

BL3: Market Solutions

9. StopWaste supports this control measure because market mechanisms are ultimately needed for an economically sustainable transition to an energy efficient and decarbonized building stock.

BL4: Urban Heat Island Mitigation

10. While mitigating the heat island effect does reduce cooling loads (where cooling loads exist) and result in improved comfort, we recommend that the Air District make conservative estimates on the energy savings potential of these strategies. It is common to overestimate the prevalence of air conditioning and space cooling systems, particularly in the milder climate zones in the Bay Area.
11. We recommend adding comfort and reduced black-out events to the list of co-benefits.
12. Please see additional comments under NW2: Urban Tree Planting that relate to this measure.

EN1: Decarbonize Electricity Generation

13. This measure promotes an increase in cogeneration. Co-generation of wood chips is established but declining due to economic factors. In the current context, we recommend that composting is prioritized as a main option for woody materials, given its carbon sequestration benefits.

EN2: Decrease Electricity Demand

14. We recommend that this control measure be closely coordinated with BL1. The implementation actions as currently written do not appear to align.

TR1: Clean Air Teleworking

15. StopWaste supports this control measure and encourage the Air District to leverage advanced technologies and innovative space sharing models in the Bay Area. Proponents of telecommuting suggest that the practice has waste prevention co-benefits. It reduces material consumption and waste related to vehicle ownership and usage such as wear and tear on vehicles and road infrastructure (which applies to all trip reduction measures) and in the form of office supplies and built office space and infrastructure. Virtualization or dematerialization of business processes and products for industries that primarily deliver services and information also results in waste prevention.

TR16: Cars & Light Trucks

16. StopWaste encourages the Air District and MTC to explore leveraging energy efficiency programs discussed in control measures BL1 and EN2 to promote PEV readiness. Property owners may be interested to install electric vehicle supply equipment (EVSE) as part of a comprehensive building energy efficiency and renewable energy installation project. For example, the BayREN multifamily advising program could add EVSE recommendations to their services. It is important to consider the interaction between EV charging load and building energy usage loads, as EVs can potentially double the overall load on the grid.

NW1: Carbon Sequestration in Rangelands

17. StopWaste supports the Air Districts control measure to increase carbon sequestration in rangelands across the Bay Area by providing technical and research assistance to local government and regional agencies and private owners of rangelands. We would be interested in bringing more of these BMPs to Alameda County rangelands.

NW2: Urban Tree Plantings

18. We recommend a minimum rootable soil volume for street trees in order to support a healthy urban forest. Street trees often are planted into compacted soil, subsoils road base, rock and/ or are bound by concrete. To be healthy and grow to full size, trees need loose, arable soils. Urban trees would benefit from a minimum organic matter of 5% to grow to their full potential (per the State's Model Water Efficient Landscaping Ordinance (MWELO) which specifies 4 cubic yards of compost/thousand square ft). We recommend matching the City of Emeryville's requirement[1] that all new street trees have the following minimum rootable soil volumes :
    - Large tree: 1200 sq. ft.
    - Medium tree: 900 sq. ft.
    - Small tree: 600 sq. ft.

    Another helpful resource is DeepRoots web page of municipal codes.[2]

19. We recommend that the Air District encourage the planting of large stature trees where appropriate as they have exponentially larger positive impacts for clean air, storing carbon and reducing stormwater runoff than small stature trees. The Western Washington and Oregon Community Tree Guide contains relevant explanation and statistics. The Bay-Friendly Rated Landscape scorecard awards points for the planting of large stature trees. Supporting sustainable landscape standards is another way to support urban tree health.

20. We support the need for further study of emission trade-offs and recommend to not add another criteria such as low VOC trees since there are many criteria now that end up restricting the selection of urban trees. Trees overall have a positive impact and there are not enough resources available to support proper management of urban trees.

SL1: Short Lived Climate Pollutants

21. We support the proposed Implementation actions of increasing the stringency of landfill methane control measures; reduce landfill quantities by expanding recycling and waste diversion, especially organic material diverted to composting; and develop model policies for local adoption such as zero waste, requiring compost use in landscapes, and Construction & Demolition materials diversion.

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[1] http://www.ci.emeryville.ca.us/1086/Climate-Resilient-Street-Trees
[2] http://www.deeproot.com/blog/blog-entries/soil-volume-minimums-organized-by-stateprovince

SL1: Guidance for Local Planners:

22. We support proposed potential actions such as reduce methane emission from landfills by diverting food waste and organic materials from the waste stream.

SS38. Odors

23. StopWaste agrees with the Air Districts goal to reduce emissions of odorous substances and place limits on odorous compounds. We recommend that the Air District coordinate with other agencies already regulating odorous substances in order to minimize duplication of effort and unintentionally causing undue costs to the facility operators. Specifically, CalRecycle addresses odors in their compost regulations.[3] Odors are directly tied to improper handling of feedstocks and management of the compost process and can be an indicator of poor material management. CalRecycle requires every operator to have an Odor Impact management plan. If our interpretation of the California Code of Regulations, Health and Safety Code section 14705 is correct, the Air District may not have jurisdiction to regulate composting facility owners and would benefit from working collaboratively with the Local Enforcement Agency.
24. When evaluating complaint thresholds, we encourage the Air District to consider situations in which multiple odor sources may be overlapping. While 73% of the odor complaints about composting facilities came from the same community there are several operations in a concentrated area contributing to the odors. In addition to the compost facility are two landfills, a sewage treatment plant, a sewage sludge drying area, bay estuary, salt drying beds, and seasonal marsh lands that can contribute to odor impacting the referenced community.
25. Enforcement of current compost regulations can be uneven across the state since the enforcement agencies are local, with staff and departments that have different levels of knowledge, training and resources. We recommend that the Air District support CalRecycle to adopt strategies toward having a better, rigorous, and consistent statewide enforcement of current compost regulations. This would be the most efficient and effective approach to regulate odors from composting facilities. The regulations should be enforced such that they benefit compost facilities who are acting in good faith to comply with compost regulations , penalize those that are not, and close down operations that do not have required permits.

WA1: Landfills

26. StopWaste supports higher controls on methane emissions at active and closed landfills.
27. StopWaste recommends that the Air District add an implementation measure to support bans to keep organics out of landfills as a method to reduce methane.
28. StopWaste has reviewed Air District documents that contribute to the formation of these control measures and recommend that the Air District revisit its GHG emissions assumptions. Specifically, we believe the Base Year 2011 GHG Inventory Summary Report underreports the contribution of GHG emissions from Landfill. The methodology for landfill fugitive emission sources assumes 75% of landfill gas is captured. In order to align with IPCC Guidelines, which direct inventories to rely on county specific known variables, we recommend that the Air District adjust the throughput flux emissions to

[3] http://www.calrecycle.ca.gov/swfacilities/compostables/Odor/OIMP/default.htm

acknowledge actual circumstances of landfill operations. Studies have shown that the majority of organics decompose within a short period of time after delivery to the landfill and prior to the installation of any gas recovery system. Typically landfill gas collection systems do not become operational for 2-3 years after the waste has been deposited, whereas emission fluxes for organics decomposing in landfills occurs within 0-90 days of deposition. This means the majority of landfill Criteria Air Pollutant and GHG emissions are fugitive area source emissions not quantified by The Air Districts emission inventory.

29. The Air District correctly acknowledges statewide requirements set forth by AB-32, AB-1826 and other statewide objectives of diverting waste from landfills. We urge the Air District to partner and support public and private entities on the local, regional and state level that have already taken a lead in addressing the diversion of organics from landfill and have mature programs in place.

30. Ultimately one of the best methods to prevent fugitive emissions may be prevention by banning the bulk of organic materials from the landfill. StopWaste adopted a countywide ordinance in January 2009 banning the placement of plant debris in landfills for either disposal or Beneficial Reuse, and urge the State to do the same. We invite the Air District to use StopWaste's plant debris ban as a model and lessons learned from implementation to benefit other jurisdictions.

WA2: Composting and Anaerobic Digestion

31. StopWaste strongly discourages the Air District from introducing rulemaking that would inhibit or slow the development of composting and/or Anaerobic Digestion facilities (ADF) in the region. There are already significant barriers service providers must overcome including land-use, transportation, and infrastructure costs which make this fledgling industry vulnerable. As a result, the Bay Area may either have insufficient composting/anaerobic digestion capacity and/or ship its organic materials longer distances to regions outside of the Bay Area.

32. StopWaste recommends that the Air District treat composting facilities and ADFs differently. These are two very distinct and separate processes for managing organics. Composting is an aerobic biological decomposition process typically in an open system while Anaerobic Digestion is typically a closed system of anaerobic biological decomposition. Each process has variants which create different emissions and different products. The treatment of feedstock and the metrics of monitoring are not alike, including C:N ratio, moisture content, ph, aeration rates, and temperature. These differences require different approaches. CalRecycle has developed information and programs to promote anaerobic digestion. We recommend that the Air District reference CalRecycle's resources and coordinate rule development in the area of composting and anaerobic digestion. We recommend carefully studying the impacts new rules will have on this fledgling industry.

33. StopWaste has reviewed the technical documents referenced in the quantification of emissions related to the treatments of organic materials. In the attachment to these comments we offer several observations of areas where the accuracy of quantification may be improved. In general, we find that the methodology may underestimate landfill emissions and overestimate composting facility emissions. We believe that refining these calculations will result in a greater preference of composting facilities over landfills. At a high level these observations are:

    a. It is important to note that composting operations and ADFs are not new point and area source emitters. The materials being processed are materials being diverted from landfill, where they would have generated emissions as well.

b. Specific data should be used wherever available, and adjustments should be considered where generic data is known to be inaccurate in specific respects. More accurate data should be sought where updated data would significantly change the quantification outcome.

c. There is need for clarification and consistency on when emissions are considered biogenic.

d. We recommend using bulk density metrics of yards to tons for feedstock material used by CalReycle and USEPA for these materials.

e. The EPA has released a new version the WARM Model v14 with updated climate impacts of alternative methods of managing waste.

f. New research conducted by UC Davis and published in 2011 in the journal of Atmospheric Environment shows that 80% of VOC emission from greenwaste composting are non-reactive/low reactive and not contributing to ground level ozone formation.

In the spirit of continuous improvement and accuracy, we invite an ongoing discussion with Air District staff to review and update emissions quantification methodology and assumptions. Please refer to the attachment, which contains specific requests for further clarification and data to inform our understanding.

WA3. Green Waste Diversion

34. StopWaste strongly supports the purpose of this measure which is to reduce the total amount of green waste being disposed of in landfills by supporting the diversion of green waste to other uses and in particular the goal of 90 percent diversion rate of suitable organics from the existing waste stream by 2030.

35. StopWaste recommends that the Source Category be Landfills only and remove composting facilities. The measure specifically addresses reducing green waste in landfills and composting facilities are a means to achieving that objective.

36. Under Implementation Actions, StopWaste recommends that the Air District partner with CalRecycle to align efforts in creating model waste reduction programs or model policies.

1. StopWaste recommends that the Model policy for Zero waste goals be broadened and support increased waste reduction/prevention goals in addition to a Zero Waste goal. Zero Waste is an aspirational goal which requires changing the structure of our global economy. In some countries, such as in Japan and parts of Europe, Zero Waste policies have resulted in the increased use of incineration in order to avoid landfilling. In Alameda County, a county charter initiative amendment, "Measure D", bans incineration of garbage in unincorporated areas of the county. Rather than a Zero Waste goal, StopWaste strives for a waste diversion goal of less than 10% "good stuff" in he landfill by 2020. "Good Stuff" means materials that currently have a recycling market available.

37. StopWaste supports the example of requiring large commercial and institutional facilities to use compost. The states' Model Water Efficient Landscape Ordinance (MWELO) recent update now requires 4 cubic yards of compost per 1000 sq. ft. of irrigated planting area for permitted landscapes. The Air District should reference the MWELO in this application and work with the Building Codes and Standards commission as well as DWR in supporting the incorporation of compost in built landscapes. In addition, we recommend that the Air District encourage the use of sustainable landscape standards such as the Bay-Friendly Rated Landscape Scorecard which results in the application of recycled compost and

mulch. StopWaste helped develop this standard which was adopted by all 17 of its member agencies as well as others in the Bay Area and beyond. The Bay-Friendly Rated Landscape program is now administered by the nonprofit ReScape California: http://rescapeca.org/rated-landscapes/

38. StopWaste supports the use of compost in urban areas and on rangelands.

39. StopWaste encourages the Air District to also support maximizing use of compost berms, socks & blankets for erosion & sediment control. Compost can prevent erosion and contamination of watersheds from heavy rains, or after wildfires. Despite studies that cite compost based erosion control as the best erosion control measures, there is slow uptake in practice. For example, even though the Caltrans model specifications include them and they are used in other parts of the state local Caltrans offices have not yet applied these practices consistently. We recommend:

- Use of compost blankets:
  - For slope (landslide) stabilization on bare or disturbed soils
  - To create vegetated filter strips for stormwater control

- Use of compost berms:
  - Adjacent to creeks or on a site perimeter to filter run off
  - To filter run off on site perimeters after earthquakes or wildfires
- Use of compost socks:
  - for check dams to slow areas of concentrated flow from stomwater
  - for slope interruptions to slow run off on steep slopes
  - for bank stabilization along water ways
  - around storm drains for inlet protection from contaminated run off in storm events and after wildfire or earthquakes

Below are some useful resources ;

- The Sustainable Site: The design manual for green infrastructure & low impact development http://www.foresterpress.com/fps_sustain.html
- Caltrans http://www.dot.ca.gov/hq/LandArch/16_la_design/guidance/ec_toolbox/organics/compost_blanket.htm
- Field experiment from David Crohn: http://www.hcd.ca.gov/nationaldisaster/docs/crohn_et_al._2013_trans_asabe.pdf

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WA4: Recycling and Waste Reduction

40. StopWaste strongly supports the Air District purpose for this measure to reduce the solid waste that the Bay Area send to landfills by strengthening recycling programs and developing additional waste reduction strategies.

41. StopWaste can be a helpful partner as it documents many best practices and case studies on waste reduction across sectors, in Alameda County and supports a county green products preferable purchasing program.

42. StopWaste encourages the Air District to support the State's and Bay Areas' Recycling Market Development Zones in the Implementation Actions section of this control measure. An effective

recycling system requires that collected materials be manufactured into useful products. It is estimated that as much as 80% of the nonorganic materials collected for recycling leaves the Bay Area through the Port of Oakland to overseas markets for remanufacturing and to countries such as China where 70% of the energy comes from burning cal The carbon footprint of the products are greatly increased due to the lack of environmental regulations, the polluting energy sources and distances traveled compared to locally remanufacturing materials into products for local consumption.

ATTACHMENT: Observations on Emissions Quantifications for Organics Waste Management Practices

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StopWaste has reviewed the technical documents quantifying emissions related to treatments of organic materials in landfill, composting facilities, and ADFs. We offer the following observations and recommendations for improving the accuracy of quantification data and methodology. We invite an open dialog and response to our observations to clarify any differences in interpretation. Our intent with this detailed review is to contribute our knowledge and experience to continuously improve the industry's practices on quantifying its emissions impacts.

1. The Air District should recognize compost operations as biogenic emissions per its own definition of Biogenic Carbon Dioxide.

   Regulation 3-240 (adopted May 21, 2008) defines Biogenic Carbon Dioxide as:

   > *Carbon dioxide emissions resulting from materials that are derived from living cells, excluding fossil fuels, limestone and other materials that have been transformed by geological processes. Biogenic carbon dioxide originates from carbon (released in the form of emissions) that is present in materials that include, but are not limited to, wood, paper, vegetable oils, animal fat, and food, animal and yard waste*.

The Air District seems to give an advantage to landfilling organics over composting by counting the emissions for the same material as biogenic in a landfill and as anthropogenic in compost operations. This extends again to other operations as in grape fermentation or burning of agricultural wastes which are counted as biogenic emissions. We urge the Air District to be consistent in its application of rules, policies and regulation in particular on how it relates to the composting of organic material which is the natural, biological decomposition of organic waste.

   a. For example, The Air District in the Base Year 2011 GHG Emission Inventory Summary Report seems to present biased projections of GHG emissions over time. The Air District, in Table V, under the Source Category Waste Management projections for GHG emission presents 3 sub-source categories for years 1990 to 2029. For the sub-source category of Landfill Combustion The Air District reports zero (0) GHG emissions. For Landfill Fugitive Sources the table shows a decline from 1.8 to 1.1 MMTCO_2-E, from 1990 to 1996, then a steady increase to 1.3 MMTCO_2-E through 2023 which declines to 1.2 MMTCO_2-E by 2029. The table shows Composting/POTW's as contribution 0.2 MMTCO_2-E from 1990 through 2029. The presentation of the data is for the following reasons:

      i. Emissions from POTW's are misrepresented because Table X characterizes the majority of POTW's emissions as biogenic.

      ii. Emissions from landfill combustion are almost exclusively attributed to be Biogenic while Composting and POTW, processing the same material are attributed as non-biogenic.

      iii. Table V does not take into account the aggressive reduction of organics from landfill which is being accomplished on the state and regional level.

2. The Base Year 2011 Emissions Inventory overestimates the contribution of criteria pollutants from composting operations by using emission factors that don't take into account the reactivity certain VOC's to the contribution of ground level ozone formation. We noticed that the Air District does not take advantage of the latest scientific peer reviewed research for characterizing the impact of emissions from composting facilities. Research conducted by UC Davis and published in 2011 in the journal of Atmospheric Environment shows that 80% of VOC emission from greenwaste composting are non-reactive/low reactive and not contributing to ground level ozone formation.
    a. Kumar A, Alaimo CP, Horowitz R, Mitloehner FM, Kleeman MJ. and Green PG. 2011. Volatile organic compound emissions from green waste composting: Characterization and ozone formation. ATMOSPHERIC ENVIRONMENT v45 (10): 1841-1848
    b. The results from the above study and others like it, suggests The Air District is attempting to regulate emissions which do not contribute significantly to ozone formation and in fact composting results in fewer emissions than in-situ decomposition. The regional air quality would be better served by The Air District focusing its efforts and resources on more substantial contributors of ozone precursors and criteria pollutant contributors.
        i. Chou CH, Büyüksönmez F. 2006. Biogenic Emissions from Green Waste and Comparison to the Emissions Resulting from Composting (Part 1: Ammonia). Compost Science and Untilization, v14 (1): 16-22
        ii. Büyüksönmez F, Evans J. 2007. Biogenic Emissions from Green Waste and Comparison to the Emissions Resulting from Composting Part II: Volatile Organic Compounds (VOC'S). Compost Science and Utilization, v15 (3): 191-199

3. The Emission Reductions attributed to WA2 Control Measure are unattainable because the Base Year 2011 Emission Inventory Summary Report for Criteria Pollutants and GHG overestimates and inaccurately reflects the emission impacts from compost operations.

a. Specifically, emissions are overestimated, presumably by inaccurately applying conversion factors to the emission inventory calculation for Bay Area sources.

The Throughput Data section of the Base Year 2011 Emission Inventory Source Category Methodologies report for "Compost Operations", pg 5.5.1-2, references CalRecycle Report *Third Assessment of California's Compost and Mulch-Producing Infrastructure — Management Practices and Market Conditions* for its density number for greenwaste = 3.54 yd^3/ton and a mixed (greenwaste mixed with food, manure etc) as 2.24 yd^3/ton.

The CalRecycle Report has several density factors listed:

- used in a foot note on page 5 of report - 3.9 yd^3 ton for ADC
- used in Table 7 for bulk density of Products

Table 7. (on page 27 of the rpt) Reported Bulk Density of Products (2008).

Product	Average Bulk Density (yd^3/ton)	Range (lbs/yd^3)
Compost	2.24	465 – 2,000
Mulch	3.54	400 – 1,176
Biomass	3.57	333 – 1,197
ADC	2.69	333 – 1,800

b. The data from Table 7 are the density factors for finished material, material that has been processed. The feedstock values have lower density factors. For example, a facility with a throughput of 20,000 yd^3/year, under the Air Districts assumption would process 5,649.7 tons per year. Using the published density factors from the CalRecycle website which ranges from 108 lbs/yd (yard trimmings, mixed) to 280 lbs/yd (grass) and 343 lbs/yd (leaves) the median value would be 243 lbs/yd or 8.2 yds/ton or for this example, 2,439 tons per year. This is half the throughput of materials estimated by the Air District.

We recommend the Air District use bulk density metrics of yards to tons for feedstock material used by CalReycle and USEPA for these materials. CalRecycle http://www.calrecycle.ca.gov/lgcentral/library/dsg/IOrganic.htm has a list of conversion factors for the raw material which are much less.

4. We recommend the Air District use a standard approach when applying emission factors. For example the BY 2011 Emissions Inventory Source Category Methodology describes under the Throughput section "mixed" as being greenwaste mixed with food and manure. However the source documentation from which the emission factors are derived treat manure as a separate material derived from livestock operations and CAFO's. Manure from CAFO's, including poultry litter, are high in nitrogen and not typically a feedstock in composting operations found in the bay area. These materials are more commonly found in central valley agricultural operations and where the emission factors reference by The Air District were developed. Use of an emission factor that was developed with manure inputs will result in an overestimation of GHG and CAP emissions.

5. We urge the Air District to use the most current tools available for determining GHG impacts such as the WARM Model v14 which calculates the climate impacts of alternative methods of managing waste. For example, 200 tons of food waste and mixed organics in equal proportions landfilled will result in 32 $MTCO_2E$ while the same material composted will result in a net -34 $MTCO_2E$, (a 66 $MTCO_2E$ differential), and if anaerobically digested would result in -13 $MTCO_2E$ or a 45 $MTCO_2E$ differential).

6. BY 2011 CAP Source Category Methodologies for Composting Operations, Page 5.5.1-1, presents data which is misleading and as used results in the overestimation of emissions from this sector. The section states, in part:

Methodology

In 2011, there were approximately 32 composting facilities1 in the Bay Area. Ten (12) of these facilities are permitted by The Air District and considered point sources (Category 1709).

The Methodology section gives an approximate number of composting facilities in the Bay Area. Use of an approximate number is not the basis for developing an emissions inventory.

The Methodology section has two numbers, "ten" (10) and twelve "(12)", for the number of facilities "permitted" by The Air District and are considered point sources. Presumably this is a typographical error but it affects the number of facilities that are calculated as a point source or an area source emitter.

7. It would be helpful if the Air District use the exact number of compost facilities it has issued permits for.

a. The Methodology section describes twelve (12) facilities (presumably the number permitted by the Air District), are described as point source emitters to which "generalized or specific" emission factors and control factors were used in the calculation to determine ROG emissions. Please provide the list of the ten (10), or twelve (12), compost facilities for which "point-source" ROG emissions were calculated. Please designate which facilities had "generalized" and which had "specific" emission factors applied to their calculation of emissions. Please provide the through-put values assigned to each. If a generalized emission factor was used, what was that factor, and when "specific" emission factors were used list what they were for each facility. Please provide for each "point-source" listed facility the control measure, if any, and its numerical influence on reducing the emission factor.

The Methodology section states, "*The other approximate 20 facilities are considered area sources (Category 1936) where annual throughput, criteria pollutant emission factors (TOG and ROG), and control activity (if any) are estimated. The TOG and ROG emissions are calculated by multiplying the throughput by the emission factor and, if applicable, the control factor*."

8. An approximation is not an effective approach for calculating an emission inventory. Please provide the specific list of the twenty (20), or twenty two (22), compost facilities for which area-source TOG and ROG emissions were estimated using throughput and provide the throughput value, emission factor, and control factor (if any) used in the calculation.

9. The Methodology section states, "*Greenhouse Gas (GHG) emission, namely methane (CH_4) and nitrous oxide (N_2O) are also associated with composting activity.*" The Base Year 2011 Emission Inventory for Greenhouse Gasses attributes, in Metric Tons per year, 86 MTyr CO_2, 484 MTyr CH_4 and 671 MTyr N_2O to Composting/POTW's (Table L) for all Bay Area sources. Table L is copied below.

Table L: Annual GHG Emissions:	**Bay Area Year 2011**		**(Metric Tons / Year)**				
SOURCE CATEGORY	**CO2**	**CH4**	**N2O**	**PFC/HFC**	**SF6**	**Non-Biogenic CO2-Equivalent**	**Biogenic CO2**
INDUSTRIAL/ COMMERCIAL							
Waste Management							
Landfill Combustion Sources	1,077	1,587	1	--	--	34,848	675,032
Landfill Fugitive Sources	--	61,747	3	--	--	1,297,643	161,550
Composting/POTWs	86	484	671	--	--	218,389	

What is the contribution of Composting Facilities to the above CO_2, CH_4 and N_2O figures presented above?

CALPINE CORPORATION

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Via Email: jpollak@baaqmd.gov

July 18, 2016

Josh Pollak
Environmental Planner
Bay Area Air Quality Management District
375 Beale Street
San Francisco, Ca 94105

Subject: Comments on Notice of Preparation of Draft Programmatic Environmental Impact Report – 2016 Clean Air Plan/Regional Climate Protection Strategy

Dear Mr. Pollak:

Calpine Corporation ("Calpine") is writing to provide comments in response to the Bay Area Air Quality Management District's ("District") Notice of Preparation/Initial Study concerning the Draft Programmatic Environmental Impact Report ("DPEIR") for the District's 2016 Clean Air Plan/Regional Climate Protection Strategy ("2016 Plan").[1]

Calpine's Commitment to Reducing Power Sector Emissions

Calpine Corporation is America's largest generator of electricity from natural gas and geothermal resources. Our fleet of 84 power plants in operation or under construction represents more than 27,000 megawatts of generation capacity. Through wholesale power operations and our retail business, Champion Energy, we serve customers in 21 states and Canada. We specialize in developing, constructing, owning and operating natural gas-fired and renewable geothermal power plants that use advanced technologies to generate power in a low-carbon and environmentally responsible manner. Of the ten largest electricity generators in the U.S., Calpine ranks as having the lowest overall emissions intensity for nitrogen oxides ("NO_x") and sulfur dioxide ("SO_2") and the lowest emissions intensity for carbon dioxide ("CO_2") among those same ten generators' fossil fuel fleets.[2] This is a direct reflection of the investments in clean generation technology Calpine routinely undertakes in developing and maintaining its fleet,

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[1] *Available at*: http://www.baaqmd.gov/~/media/files/planning-and-research/plans/2016-clean-air-plan/2016-plan-nop-is_all_061516-pdf.pdf?la=en.

[2] *See* Natural Resources Defense Council et al., Benchmarking Air Emissions of the 100 Largest Electric Power Producers in the United States, at 26 (2016), *available at*: https://www.nrdc.org/sites/default/files/benchmarking-air-emissions-2016.pdf (emissions and generation data from 2014).

which includes projects amounting to hundreds of millions of dollars of investment in the Bay Area in the past several years.

Complementing these investments, Calpine has consistently supported the U.S. Environmental Protection Agency ("EPA") in its efforts to reduce emissions in the power sector, including through its intervention in support of the EPA in defense of the Mercury and Air Toxics Standards[3] and the Cross-State Air Pollution Rule,[4] and its participation as *amicus curiae* in support of the EPA's authority to require that Prevention of Significant Deterioration ("PSD") permits for the largest sources include greenhouse gas ("GHG") emission controls.[5] In addition, as part of a coalition of power companies collectively representing approximately 10% of installed U.S. generating capacity, Calpine is currently defending EPA's Clean Power Plan in litigation brought by 27 states and the coal industry in the U.S. Court of Appeals for the District of Columbia Circuit.[6]

Within California, Calpine is a longtime supporter of California's groundbreaking Global Warming Solutions Act of 2006, Assembly Bill ("AB") 32, and the Air Resources Board's ("ARB") Cap-and-Trade Program implemented pursuant to AB 32. Calpine also supports Governor Brown's goal of reducing economy-wide GHG emissions to 40% below 1990 levels by 2030, as established by Executive Order B-30-15, and Senate Bill ("SB") 32, which is currently advancing through the Legislature and would add the Governor's 2030 goal to AB 32. Calpine also supported SB 350's passage last year, which increased the renewable portfolio standard to 50% by 2030, set a goal to double the amount of energy efficiency in the State by 2030 and is poised to help advance the electrification of transportation.

Together, these efforts reflect Calpine's overall commitment to reducing power sector emissions and supporting market-based regulatory solutions at both the State and federal level.

Calpine's Support for the 2016 Plan's Energy Sector Measures

Calpine supports the 2016 Plan's proposed control measures for the energy sector because the two particular measures proposed to-date—encouraging an increase in renewable energy (EN-1) and decreasing demand for electricity (EN-2)[7]—are consistent with and supportive of State and federal policies to reduce GHG emissions.

At the center of the State's GHG reduction plan is the Cap-and-Trade Program, which ARB is currently amending both to achieve the State's 2030 and 2050 climate goals and to serve as the

[3] *See White Stallion Energy Ctr., LLC v. EPA*, 748 F.3d 1222 (D.C. Cir. 2014), *rev'd sub nom. Michigan v. EPA*, 135 S. Ct. 2699 (2015).

[4] *See EPA v. EME Homer City Generation, L.P.*, 134 S. Ct. 1584 (2014).

[5] *See Util. Air Regulatory Grp. v. EPA*, 134 S. Ct. 2427, 2447 (2014) (citing brief for Calpine as *amicus curiae* in upholding EPA's authority to mandate that prevention of significant deterioration permits for so-called "anyway" sources require the best available control technology for GHGs).

[6] *West Virginia v. EPA*, No. 15-1363 (D.C. Cir.).

[7] Initial Study for the Bay Area Air Quality Management District 2016 Clean Air Plan/Regional Climate Protection Strategy2016 Plan, *supra* note 1, at 1-11, 1-12.

basis of the State's plan for compliance with the Clean Power Plan. Both the Cap-and-Trade Program and Clean Power Plan have been carefully designed to account for the interconnected nature of the U.S. electricity grid, the global nature of GHG emissions, and the fact that electricity regularly crosses state lines and does not observe jurisdictional boundaries. This has resulted in a carefully tailored set of requirements intended to prevent emissions "leakage," which would otherwise occur if imposition of an emissions reduction obligation on a power plant in one location were simply to cause an increase in operation of an unregulated source elsewhere.[8]

Calpine is the largest generator of electricity within the District's jurisdiction, operating more Title V facilities than any other company within the Bay Area. Calpine has cooperated with the District to advance the regulation of GHGs within the District's jurisdiction, including through its acceptance of the first-ever "best available control technology" limits for GHGs, which were included in the PSD Permit issued by the District for Russell City Energy Center before such limits were required by EPA. Calpine looks forward to working cooperatively with the District as it integrates climate protection into its broader mission as part of the 2016 Plan.

However, it is clear that the District does not have the authority to regulate emissions from sources located *outside* its jurisdictional boundaries. As a consequence, any effort to put a cap on emissions from existing power plants located within the Bay Area would be counterproductive, would not achieve any reduction in emissions of GHG and would only risk frustrating the constructive price signal imposed by the Cap-and-Trade Program. Calpine therefore supports the control measures included within the 2016 Plan for the electricity sector (EN-1 and EN-2) because they reflect ways the District can best support the State's and EPA's overarching approach for reducing power sector emissions, without risking emissions leakage to sources located outside the District.

Thank you for the opportunity to submit these comments. Please contact me if you have any questions at 925.557.2238 or barbara.mcbride@calpine.com.

Sincerely,

Barbara McBride
Director—Environmental Services
Calpine Corporation

cc: Henry Hilken, Director of Planning and Climate Protection

[8] In the case of the Cap-and-Trade Program, this has required a complex accounting mechanism to account for emissions occurring outside of California attributable to electricity consumed in California and imposition of an "import" obligation on all imported power. In the case of the Clean Power Plan, it has amounted to a set of leakage protection requirements designed to assure that imposition of an emission reduction obligation upon existing gas-fired power plants doesn't merely result in construction of new unregulated gas plants.

Transportation Solutions Defense and Education Fund

P.O. Box 151439 San Rafael, CA 94915 415-331-1982

July 18, 2016
By E-Mail to
jpollak@
baaqmd.gov

Josh Pollak
Environmental Planner
Bay Area Air Quality Management District
375 Beale Street
San Francisco, Ca 94105

Re: NOP for 2016 Clean Air Plan/Regional Climate Protection Strategy
and Proposed Transportation Control Measures

Dear Mr. Pollak:

The Transportation Solutions Defense and Education Fund, TRANSDEF, is a Bay Area environmental organization dedicated to reducing the impacts of the largest source category of GHGs, transportation, on climate. We have participated in the District's air planning efforts since the 1990s, including the 2001 SIP, the 2005 Ozone Strategy, and the 2010 CAP. Our focus has been on transportation control measures (TCMs).

The Proposed TCMs do not constitute even a half-hearted attempt to reduce motor vehicle GHG emissions. These lackluster measures are substantially equivalent to the measures of previous plans. Subsequent to the adoption of those plans, regional VMT has continued to increase and the single-occupant vehicle (SOV) mode split has remained stable, resulting in total GHG emissions from the transportation sector that continue to increase. There is no reason to expect that the Proposed Measures will provide any different results. They fail as a Regional Climate Protection Strategy.

An agency convinced that the fate of the world hung on its shoulders would come up with a far more aggressive plan to promote mode shift. The draft control measure comments we made in our April 4, 2016 letter to Mr. Broadbent, which stressed that point, were completely ignored in the Proposed TCM set considered by the Initial Study.

District staff should recognize that the measures adopted into this plan will have far-reaching effects on their grandchildren and later progeny. A continuation of the status quo will result in the planet becoming eventually uninhabitable by life as we know it. A markedly more aggressive plan to shift mode choice will capture the attention of policy makers, and help create movement in the direction of actually protecting the climate.

California chose to create a global example with AB 32 and the Scoping Plan. The Bay Area needs to do its part in demonstrating what committed leadership looks like.

Scoping

1. The Threshold of Significance for GHG impacts (Initial Study, p. 2-27) is inadequate. The Bay Area has a responsibility to reduce its cumulative GHG emissions by its proportional share of the 5 $MMTCO_2e$ statewide reduction called for by the Scoping Plan.

2. TRANSDEF strongly disagrees with this Initial Study discussion of the GHG impacts of the Plan:

> VII. b). The control measures of the 2016 Plan will support and help implement State, regional and local plans that have been developed to reduce GHG emissions. These include the State's Scoping Plan, Plan Bay Area, local general plans and climate actions plans. The 2016 Plan control measures encourage shifting modes of transportation to increase transit, walking or bicycling by supporting land use development patterns that include more mixed use high density transit oriented projects. This focus is consistent with the Scoping Plan, Plan Bay Area and other local land use plans to reduce GHG emissions from the transportation and building sectors. Other control measures in the 2016 Plan will directly support and State, regional and local climate action plans by identifying strategies to reduce GHG emissions from solid waste, water use, agriculture, energy, and existing buildings, which are common sources of GHG emissions in most local jurisdictions. **Therefore, this topic is less than significant and will not be further evaluated in the Draft PEIR**. (Initial Study, p. 2-28, emphasis added.)

This discussion completely ignores the cumulative effectiveness of the State, regional and local plan measures in achieving actual GHG emissions reductions. Growth in population and low gas prices have resulted in ever-increasing gasoline consumption and VMT, thereby increasing GHGs. The DEIR needs to quantify the cumulative level of expected GHG emissions reductions to determine whether net regional GHG emissions are increasing. It further needs to determine whether the region is doing the part assigned to it by the Scoping Plan in achieving actual decreases in GHGs. More aggressive measures would be needed as mitigations if either Threshold of Significance is exceeded. (see Alternatives, below.)

3. What are the environmental impacts of the proposed Plan's failure to significantly influence the mode choice of travellers in the Bay Area, in terms of congestion, GHGs?

4. In evaluating cumulative impacts, specifically examine the GHG impacts of the RTP's Express Lane system, and the increased SOV travel it induces.

5. The demand for parking facilities is no longer an environmental impact, as per SB 743. (Initial Study, p. 2-50.)

6. While implementation of the Proposed Plan may not increase VMT, it will do little to restrain growth in VMT, a primary correlate of GHG emissions. (Initial Study, p. 2-51.) Therefore, the Plan's failure to reduce VMT is a significant environmental impact.

Alternatives

Because the Bay Area is known as a center of progressive environmental policy, a far more aggressive CAP would act as a model for other areas of the United States and the world to emulate, thus achieving GHG emissions reductions far beyond what is attainable for the region alone. The District should model Alternatives that achieve significantly larger GHG emissions reductions. Policymakers need to know what is possible, both for a low-controversy plan and for alternatives that are more politically difficult. The selection of a final Plan should be left to policymakers, with the options not overly constrained by staff.

1. TRANSDEF recognizes that a great deal of work was done in the preparation of California Transportation Plan 2040. Specifically, Scenario 3 was designed to achieve the 80% reduction in GHGs called for in state policy, and would provide a useful local benchmark for that level of effort. (While the scenarios were modelled, they were not studied in an EIR.) There should be model input files available, from which the Bay Area could be extracted, that would greatly reduce the expense of developing an Alternative.

2. We continue to see reducing VMT as the indispensable element of GHG emissions reductions. Another alternative could study a strong disincentive to adding more vehicle trips to the regional network. This could be achieved through an Indirect Source Mitigation fee that set a high price (for sake of discussion, $10,000) on adding vehicle trips. ISR could shift the economics of development so that the political influence of developers would focus on increasing transit near their projects, rather than roads.

3. Pricing has always been recognized as a tool that can actually reduce congestion and GHGs. Please model an alternative that imposes a per mile charge on the use of the mixed-flow lanes of freeways. This alternative would not have any HOT lanes. The development of license plate reading technology has made this kind of pricing practical for the first time.

4. TRANSDEF's RTP Scoping Comments, attached, provide more alternatives.

Comments/Questions on Proposed Transportation Control Measures

TR1: What level of participation was modeled? What were the determinants of that level?

TR2: "Personal preferences" are not a barrier to ridesharing, per se. Barriers prevent a choice from being made. Personal preferences are part of the choice process itself.

TR2: The Air District should acknowledge the congestion and air quality problems associated with motor vehicles by amending its CEQA Guidelines to add an additional threshold of significance for transportation impacts: the addition of a vehicle trip, thus triggering the need for mitigation. The District should comment on each EIR being produced in the region, noting the need for mitigation of added vehicle trips through conditions of approval. Those conditions could include trip caps, funding and space for car share parking, electric vehicle charging facilities, parking cash-out, and paid parking.

TR3: Current levels of funding for bus operations are inadequate. To incentivize users to change their mode choice to transit, far more funding is needed than is now provided. A TCM based on available funding is not a control measure. It merely reaffirms transit's irrelevance to policymakers.

TR4: Capitol Corridor is considered intercity rail, not commuter rail. BART to Santa Clara is an outrageously expensive duplication of effort. It is a tradeoff that cannot be justified when compared to the emissions reductions possible from far more cost-effective projects that are currently unfunded.

TR5: The technology that has operated Clipper is so expensive that it crowds out the actual provision of transit service. There is a tradeoff between using an equally expensive technology for the next version, and selecting a much less expensive technology that could free up funding to provide additional emissions reduction through increased service and ridership.

TR8: Our understanding is that the pilot ridematching programs have been completed, with disappointing results. The information in the draft TCM appears to be obsolete. A major problem in gaining participation in the pilot was the absence of meaningful incentives. The most obvious incentive is access to HOV lanes, which would require active enforcement of violators to provide a consistent travel time advantage. In addition, providing that advantage will require not congesting these lanes by adding SOV toll-payers. If the incentives can be fixed so that access to HOV lanes functions as an incentive, dynamic ridematching could become a major success, with zero public capital costs.

TR10: In the Emission Reduction Methodology of the draft TCM, person-trips appear to be confused with vehicular trips. "Baseline and infill mode-share shares are assumed to be equivalent in the baseline and infill person trip scenarios." This is nonsensical, as it eliminates all the benefits of infill.

TR11: Note that this measure is primarily a group of studies, and not an actual control measure.

TR12: The CHP has greatly reduced its highway enforcement activities, resulting in a marked increase in average uncongested speeds. Without vigorous enforcement, this measure is merely empty words.

TR13: Include in this measure the elimination of public funding for parking structures, unless it includes a commitment to a fee structure that fully recovers public capital and operating costs.

TR14: Please identify any evidence demonstrating that the owners of plug-in hybrids are willing to bother with midday recharging, given the hassles of shifting vehicles in and out of charging spaces. If none is found, please eliminate any consideration of public charging for this class of vehicles.

TR15: Please identify any evidence demonstrating that Spare the Air has benefits worth its substantial cost.

TR16: How many plans will the District write that reference Indirect Source review, without ever implementing it? The District withheld ISR approval in the last CAP, pending consideration of SJVAPCD's fate, and then lost interest. ISR is a critical regulatory tool. By shifting the price of auto-oriented development, ISR can influence developer proposals.

TR18: This measure should specifically identify the shifting of freight to rail as a component of the plan. This may involve several elements, including the possibility of financial incentives to shift loads to rail, thereby getting trucks off the roads, and aiding in the construction of rail infrastructure to facilitate service from the ports to distribution centers in the Central Valley and elsewhere. The District should consider an incentive system whereby truck with engines that meet the latest standards are allowed access to highway facilities that older trucks cannot. That would mitigate the identified tradeoff where new capacity for trucks would increase diesel exposures of residents.

TR22: Ensure that the District's standard mitigation package for construction impacts requires Tier 4 diesel off-road equipment. That will trigger retrofits and the replacement of older equipment.

TR23: The $940 cost per piece of equipment replaced seems extremely high.

TRANSDEF appreciates this opportunity to comment on the NOP and draft control measures. We stand ready to assist the District in formulating a plan that will create significant reductions in the region's GHG emissions. Unfortunately, the Proposed Plan will not achieve that result.

Sincerely,

/s/ DAVID SCHONBRUNN

David Schonbrunn,
President

Transportation Solutions Defense and Education Fund

P.O. Box 151439   San Rafael, CA 94915   415-331-1982

June 15, 2016
By E-Mail to:
eircomments
@mtc.ca.gov

Steve Heminger
Metropolitan Transportation Commission
375 Beale Street, Suite 800
San Francisco, CA 94105

Re: 2017 RTP/SCS Scoping Comments

Dear Mr. Heminger:

The Transportation Solutions Defense and Education Fund, TRANSDEF, is an environmental non-profit advocating the regional planning of transportation, land use and air quality. Our focus in recent years has been on reducing the impacts of transportation on climate change. This marks the seventh Regional Transportation Plan process in which we have participated.

These comments are intended to test a coherent set of the latest policies from Caltrans:

> California's goal for all sectors and economic activities is to reduce GHG emissions while we go about our daily business. For transportation, this means making significant changes in how we travel. We must provide access and mobility for people and businesses, yet reduce our single occupant miles travelled and advance cleaner vehicles and fuels. (California Transportation Plan 2040, Final Draft version ("CTP"), p. 87.)

TRANSDEF recognizes that the environmental review process was set into law for the purpose of improving projects. It was not intended to merely generate stacks of unread paper documenting foregone conclusions. As a result, we believe that the appropriate testing of different conceptual approaches to the solution of regional problems is both warranted and desirable.

An ongoing controversy exists as to the long-held MTC conclusion that "transportation investments do not move the needle," referring to the ability of an RTP to produce significant shifts in travel patterns, mode split and GHG emissions. TRANSDEF, on the other hand, strongly believes that well-designed cost-effective projects, selected to advance specific strategic objectives, will produce better outcomes.

This was demonstrated in the 2005 RTP FEIR, in which the TRANSDEF Smart Growth Alternative outperformed[1] the adopted staff alternative. We believe that MTC's practice of selecting politically popular costly transportation projects for the RTP over better-performing ones is the core reason that total transit ridership in the Bay Area is now lower[2] than it was in 1982[3]--and far lower per capita, due to population growth.

To resolve this important policy question, we propose that MTC/ABAG study the following transportation sub-alternatives, based on the land use assumptions of the Big Cities Scenario, as defined by MTC/ABAG staff. We believe that comparing the outcomes of these sub-alternatives with the outcomes of the Big Cities Scenario will provide MTC/ABAG with invaluable data for policy making. In addition, utilizing inputs from CTP 2040 Scenario 2 will perform a comparison between MTC's model and the State's.

Cost-Effectiveness Sub-Alternative

This Alternative is guided by the chief conclusion of our strategic analysis: The Bay Area has far too many personal vehicles for the Single Occupant Vehicle (SOV) mode to be viable for commuting. We recognize that when a large percentage of the population insists on commuting at the same time, a mass transportation solution, rather than reliance on individual transportation, is required. The Alternative does not waste funds attempting the hopeless task of maintaining SOV mobility. It builds no additional SOV capacity.

Consistent with CTP 2040 Scenario 2, this Alternative tests building convenient transit options, hopefully resulting in a significant drop in the SOV mode share and GHG emissions.

This Alternative uses the transportation project definitions[4] of the 2005 TRANSDEF Smart Growth Alternative.[5] The input files of transit headways that were developed for the 2005 EIR should still be stored at MTC. If not, we can provide them to avoid unnecessary duplication of work.

Obviously some things have changed since we created the Alternative back in 2004. SMART and eBART will soon be operational, so their trips need to be input to the model. BART built the central section of our Delta DMU proposal, so that project should

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[1] http://transdef.org/RTP/RTP_Analysis_assets/Technical Report.pdf

[2] See graph at http://transdef.org/Bay_Area/Bay_Area.html

[3] TRANSDEF had sought to enforce TCM 2, MTC's commitment in the State Implementation air quality Plan to increase regional transit ridership in 1987 by 15% over the baseline year of 1982.

[4] http://mtcwatch.com/2004_RAFT_RTP/2004_RTP_Main.html

[5] http://transdef.org/RTP/RTP.html

be omitted. Please contact us to resolve questions about handling other changes to the regional network.

Altamont Corridor Rail Project: Since we designed the Bay Area High-Speed Rail Service in 2004, the Altamont Corridor Rail Project was developed as a collaboration of ACE and CHSRA, among others. For our Alternative, we have replaced the Bay Area High-Speed Rail Service with the Altamont Corridor Rail Project, as the latter is better defined. An EIR for the project was scoped in 2009 but never completed. The 2011 Preliminary Alternatives Analysis[6] has a list of preferred alternatives on p. 5-1. (Some of these alternatives bear a striking similarity to the Altamont HSR alternative[7] TRANSDEF proposed to CHSRA in 2010.) For this project, we propose the following specifications/ enhancements:

- 20 minute headways for the peak period and 30 minute off-peak.
- Service to Downtown San Francisco via the Dumbarton Rail Bridge and DTX.
- A new ROW from Stockton to Sacramento, allowing one-seat rides from Sacramento to San Jose and San Francisco.
- San Joaquin trains westbound from Stockton are rerouted to San Jose via this new line, greatly increasing the ridership.
- Travel time from Stockton to San Jose is 1:00.
- California HSR is assumed to not be functional during the Plan period.

Altamont Funding: This Alternative does not provide any regional contribution to BART extensions, making funding available for this project. As the transit solution for one of the top ten congested highway corridors in the region, this project should compete very well for cap and trade funding. For RTP purposes, assume a project cost of $4 billion.

Highway Funding: Please note that, in striving for policy coherence, this Alternative provides no funding for so-called Express lanes or other highway capacity-increasing projects. Instead, like CTP 2040 Scenario 2, HOV networks are made continuous by converting mixed-flow lanes. (Appendix 7, p. 11.) Highway construction funding is used to meet the needs of SHOPP, and highly visible enforcement of HOV lane occupancy limits. HOV lanes will be presumed to operate at at least FHWA minimum speeds. Available funding not needed for basic maintenance is swapped with sales tax counties for money eligible to spend on transit operations.

Transit Speeds: Like CTP 2040 Scenario 2, significantly higher transit speeds are key to productivity and carrying large passenger loads at reasonable operating costs. In this Alternative, we propose these methods of achieving the 50% higher speeds assumed by Scenario 2:

- Widespread use of traffic signal priority for buses

[6] http://transdef.org/2017_SCS/Altamont Corridor Rail Project Preliminary AA Report.pdf

[7] http://transdef.org/HSR/Altamont_assets/Exhibit_C.pdf

- Arterial HOV lanes where needed to bypass congestion
- Automated enforcement of transit lanes, with all fines going directly to the transit operator.[8]
- Unlike CTP 2040 Scenario 2, HOV minimum occupancies are not changed, as TRANSDEF believes that would result in limiting the HOV mode share.

Land Use: We note with approval that the description of the Big Cities Scenario includes elements that have no basis in current law or policy, including changing parking minimums and the office development cap. MTC had raised serious feasibility concerns about our 2005 RTP Alternative because we proposed innovations like these. It is only by testing proposed policies that decision-makers can determine whether to support legislation to make the innovation possible.

In addition to incorporating all of the Scenario's land use assumptions, the Alternative includes:

- No public subsidies for the operation or construction of parking within PDAs.
- The conditioning of funding for PDAs on enactment of the parking and other policy reforms proposed by the Big Cities Scenario.
- Required unbundling of the parking from leases and residential purchase agreements.
- Encouragement for the permitting of micro-apartments and Junior Second Units.

This Alternative's focus on increasing the availability of convenient transit should meet a critical need of PDAs, and the Big City Alternative in particular. We would be pleased to discuss the proposed headways with staff, and adjust these specifications to find an optimal balance of ridership and cost, as well as adjust the dollar inputs to meet the financial realities of today.

<u>Pricing Sub-Alternative</u>

CTP 2040 Scenario 2 is described in Appendix 7 (pp. 11-12) as increasing the out-of-pocket cost of urban driving by 133% (from $0.23 to $0.55 per mile). We propose to achieve this by implementing some of the following pricing programs:

- Mixed-flow lane freeway tolling during congested periods.
- A parking charge on all commercial parking spaces, including privately owned ones. This could conceivably be achieved through public funding of the installation of parking management hardware: gates and access controls. This would enable excellent administration of employee commuter benefit programs.
- Impose a regional transportation mitigation fee on new development, based on additional auto trips and VMT added to the regional network. If the fee is high enough, it will increase the desirability of developing close to transit and decrease interest in greenfield sites. This could come in the form of an Indirect Source Mitigation Fee, which has been under consideration by BAAQMD.

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[8] http://arch21.org/BusLanes/BusOnlyPaper.html

While the Big Cities Scenario contains cordon pricing and incentive programs, the Notice of Preparation does not specify the degree of cost increase proposed. This Sub-Alternative therefore prescribes the increase in the cost of driving, and some of the potential ways to achieve it.

Back in 2004, the travel demand model was limited in its ability to study pricing. We were forced to use a daily parking charge as a surrogate for the road user charges we wanted studied. Please contact us to discuss what is possible with the current model.

A key part of this Sub-Alternative is drawn from the experience of LACMTA. After it entered into a consent decree with the Bus Riders Union, bus fares were very substantially reduced. Bus ridership went up dramatically. Conversely, after the consent decree expired, fares rose and ridership dropped. TRANSDEF proposes this Sub-Alternative model a fare reduction here in the Bay Area, to test whether price sensitivity is different up here. We propose cross-subsidizing fares from the revenues received through pricing, with a target of reducing fares by 80%.

For simplicity and directness of comparison, this Alternative uses the exact same transportation and land use assumptions as the Cost-Effectiveness Sub-Alternative.

Conclusion

TRANSDEF is committed to achieving GHG emissions reductions and VMT reductions at the regional level. These Alternatives represent our best thinking as to what can be done, and what needs to be done. Studying the Alternatives proposed here will place concrete choices before the agencies. We think it is far healthier for the agencies to either accept or reject the choices in public than avoid altogether the discomfort of "pushing the envelope." We stand ready to provide whatever further inputs might be needed or useful. We look forward to collaborating on the best RTP yet.

Sincerely,

/s/ DAVID SCHONBRUNN

David Schonbrunn,
President

CC:
Steve Kinsey, MTC
Ezra Rapport, ABAG
Jack Broadbent, BAAQMD
Larry Goldzband, BCDC
Stacey Mortensen, ACE & SJJPB

July 18, 2016

Josh Pollak, Environmental Planner
Bay Area Air Quality Management District
375 Beale Street
San Francisco, CA 94105

Subject: **2016 Clean Air Plan/Regional Climate Protection Strategy, Notice of Preparation/Initial Study**

Dear Mr. Pollak,

Thank you for the opportunity to provide comments on the Notice of Preparation/Initial Study (NOP/IS) for the 2016 Clean Air Plan/Regional Climate Protection Strategy. The City regards the 2016 Clean Air Plan/Regional Climate Protection Strategy (2016 Plan) as a comprehensive approach to reducing air pollution and protecting the public health that will be beneficial to the Bay Area. San José's comments are mainly focused on proposed control measures and implementation of the 2016 Plan for future City projects.

<u>Proposed Control Measures:</u>

SS-38 (Odors) – The San José-Santa Clara Regional Wastewater Facility (Facility), through its Plant Master Plan, is committed to an Odor Control objective and over the next 10 plus years, will reduce the overall footprint of the Facility. It has also conducted a comprehensive odor study that will be used to inform the odor control design aspects of capital projects in its Plant Master Plan, but offers that for large facilities, capital project timelines, while committed to, do not always allow for immediate response to changing regulations. The City is also interested in understanding how the new technologies will be vetted and field tested, and who will participate in their evaluation.

EN-1 Decarbonize Electricity (All Pollutants) – The City of San José is supportive of EN-1 in its current draft form. The City is actively engaged in evaluating a San José community choice aggregation, or CCA, program. San José's CCA program, like others, would have goals to maximize the renewable energy in its portfolio and increase the local renewable energy supply. The City is also actively engaged in increasing the use of biomass in electricity production both by partnering with the Zero Waste to Energy Development and contracting for the processing of organic food waste at that facility. The City would welcome future discussions with the BAAQMD to further these efforts.

EN-2 Decrease Electricity Demand (All Pollutants) - The City of San José is supportive of EN-2 in its current draft form. San José is already actively engaged in the implementation and evaluation of policies and programs to further energy-efficiency in our municipal operations and community, primarily through our lead role for Silicon Valley Energy Watch, a local government partnership with PG&E that serves the entirety of Santa Clara County. The City would welcome further support in the form of best practices, model ordinances, grant funding opportunities, and technical support.

WA-3 Green Waste Diversion (All Pollutants) - San Jose supports the reduction of green waste going to landfill through adoption of ordinance, participation in statewide task force, and tracking of legislative efforts. The residential contracts prohibit green waste disposal in landfills and requires processing into compost, mulch, or other approved products. Municipal Code incentivizes use of other materials such as dewatered sewage sludge to be utilized as ADC. In the past, San Jose has been involved in a statewide task force to reduce yard trimmings in landfills by 50 percent, and has supported legislation to eliminate diversion credits for green waste ADC, or imposition of fees for green waste at landfills.

WA-4 Recycling & Waste Reduction (GHG) - The City of San José is supportive of WA-4 in its current draft form. In 2007, the City adopted a Zero Waste Goal by 2022, and has operated a Construction & Demolition Diversion (CDD) Program since 2001.

WR-1 Limit GHGs from POTWs (GHG) - The City of San José through its Plant Master Plan, is committed to an Odor Control objective. It has conducted a comprehensive odor study that will be used to inform the odor control design aspects of capital projects in its Plant Master Plan, and will focus on arresting fugitive emissions, since odorous compounds will be among them. The Facility would like to note that for large facilities, capital project timelines, while committed to, do not always allow for immediate response to changing regulations. The City of San José would also need to better understand the details of how these emissions will be investigated and quantified, and who will participate in their evaluation.

WR-2 Support Water Conservation (GHG) - San José Municipal Code mandates various conservation actions that are in effect at all times and address landscape and irrigation, outdoor cleaning activities, hospitality industry requirements, construction sites, and the use of recycled water. The City's General Plan, Envision San José 2040, includes conservation elements that address landscape, green buildings, water, outreach, and protection of groundwater supplies.

Implementation Strategy for Local Jurisdictions:

The 2040 General Plan is committed to policies and strategies that reduce greenhouse gas, and overall protect the public health of San José residents. The City of San José would like to better understand the details of how Bay Area Air Quality Management District (BAAQMD) envisions implementation of proposed control measures for local jurisdictions (i.e. model ordinances or new local regulations adopted as a Regional Permit). To ensure that model ordinances and/or regulations do not unduly burden the City's land use authority, San José, as one of the largest City's in the Bay Area, should be involved in the development of the implementation process.

Thank you for the opportunity comment on the 2016 Plan NOP/IS. The City of San José looks forward to continued collaboration and communication on the development of the 2016 Plan EIR and associated implementation plan. Please include Jason Rogers, Division Manager, Environmental Review Team at (408) 793-5543 or jason.rogers@sanjoseca.gov, or Rosalynn Hughey, Assistant Director, at (408) 535-7911 or rosalynn.hughey@sanjoseca.gov if you should have any questions.

Sincerely,

J. R. Rn

Jason Rogers, Division Manager
Department of Planning, Building & Code Enforcement
City of San José

cc: Harry Frietas, Director, Department of Planning, Building & Code Enforcement
Kerrie Romanow, Director, Environmental Services Department
City Attorney
Mayor's Office

APPENDIX C

EMISSIONS REDUCTIONS ESTIMATION METHODOLOGIES

This appendix describes the methodologies used to calculate the expected emissions reductions for the control measures for which reductions could be calculated, and which have not yet been fully adopted.

SS1: FLUID CATALYTIC CRACKING UNITS IN REFINERIES

Emission Reductions:

Pollutants*	2020	2030
$PM_{2.5}$	1,222	1,222
TACs	241	241

**criteria pollutants and TACs are reported in lbs/day*

Emission Reductions Methodology:
Implementation of this control measure is estimated to reduce condensable PM from the FCCUs by approximately 50%. However, due to uncertainty in both the baseline emissions and the results of the ammonia optimization, the actual emissions reductions may differ from this estimate. Further reductions of PM2.5 and other pollutants will be determined by the specific future implementation actions in a future amendment of Regulation 6-5.

SS5: SULFUR RECOVERY UNITS

Emission Reductions:

Pollutants*	2020	2030
SO_2	900	900

**criteria pollutants are reported in lbs/day*

Emission Reductions Methodology:
Total SRU SO_2 emissions were estimated to be 1,400 lb/day. The total reduction of 900 lb/day was calculated by adding the estimated emissions reductions for each individual SRU. These individual SRU emissions reductions were estimated by first determining the current tail gas SO_2 concentration and current emissions, calculating the percentage concentration decrease that would be needed to meet the 5 ppm SO_2 limit, and applying that percentage reduction to the current emissions.

SS6: REFINERY FUEL GAS

Emission Reductions:

Pollutants*	2020	2030
SO_2	6,000	6,000

**criteria pollutants and TACS are reported in lbs/day*

Emission Reductions Methodology:
Total RFG SO_2 emissions were estimated to be 8,600 lb/day. RFG sulfur processing and removal is linked with nearly all refinery processes, and improved sulfur removal is typically implemented with other refinery modifications. To estimate potential emission reductions, sets of improvements that reduce sulfur in RFG were developed for the two refineries which currently combust RFG with elevated levels of organic sulfur compounds. The estimated reduction of 6,000 lb/day is based on those improvements.

SS7: SULFURIC ACID PLANTS

Emission Reductions:

Pollutants*	2020	2030
SO_2	2,800	2,800

**criteria pollutants are reported in lbs/day*

Emission Reductions Methodology:
Total Acid Plant SO_2 emissions were estimated to be 3,300 lb/day. The total reduction of 2,800 lb/day was calculated by adding the estimated emissions reductions for each acid plant. These emissions reductions were estimated by first determining the current SO_2 outlet concentration and current emissions, calculating the percentage concentration decrease that would be needed to meet the 10 ppm SO_2 limit, and applying that percentage reduction to the current emissions.

SS14: METHANE AND OTHER FUGITIVE EMISSIONS FROM CAPPED OIL AND GAS WELLS

Emission Reductions:

Pollutants*	2020	2030
CO_{2e}	19	19

CO_{2e} is reported in metric tons/year (100 yr GWP)

Emission Reductions Methodology:
Due to accessibility issues (e.g., plugged wells under built structures), it likely will not be possible to repair all leaking wells. Assuming Bay Area capped wells were emitting methane at the median leak rate from the Pennsylvania well study (Kang *et al.*, 2014), repairing 90 percent of leaking wells would result in emissions reductions on the order of 47 MT CO_2e per year (20 year GWP) or 19 MT CO_2e per year (100 year GWP). However, if a fourth of the Bay Area wells were in the “high emitter” category (a fraction similar to that found in the same study), emissions reductions could be on the order of 18,000 metric tons of CO_2e per year. In addition, leaking plugged wells are likely emitting toxic pollutants such as BTEX[1] in addition to methane (Warneke *et al*., 2014). Based on typical mixing ratios of methane to toxic VOCs emitted from active oil and gas wells, these repairs could also result in emissions reductions on the order of 200 pounds per year of benzene, 340 pounds per year of toluene, and 225 pounds per year of C8 aromatics such as ethylbenzene and xylenes.

[1] BTEX stands for benzene, toluene, ethylbenzene, and xylenes.

SS15: NATURAL GAS PROCESSING, STORAGE AND DISTRIBUTION

Emission Reductions:

Pollutants*	2020	2030
CO_{2e}	283,062	283,062

**CO_{2e} is reported in metric tons/year (100 yr GWP)*

Emission Reductions Methodology:
As was discussed above, current estimates suggest that approximately 1.4 MMT CO2e are due to line losses, when using a 20 year time horizon. If a natural gas LDAR program could reduce line losses by 50 percent, this program would result in an estimated emissions reduction of 715,980 MT of CO_2e per year (20 year GWP) or 283,062 MT of CO_2e per year (100 year GWP).

SS19: PORTLAND CEMENT

Emission Reductions:

Pollutants*	2020	2030
SO_2	4,493	4,493
CO_{2e}	85,055	85,055

**criteria pollutants are reported in lbs/day; CO_{2e} is reported in metric tons/year (100 yr GWP)*

Emission Reductions Methodology:
To estimate the reduction in SO2 emissions, a projected 60% abatement factor was applied to the operating permit potential to emit. The estimate of CO2e reductions is based on the assumption that 10% of the petroleum coke currently burned would be replaced with biomass, which was assumed to be carbon neutral.

SS22: STATIONARY GAS TURBINES

NOTE: These emissions reductions have been updated and revised from the estimates contained in the 2017 Plan.

Emission Reductions:

Pollutants*	2020	2030
NO_x	1,500	1,500

**criteria pollutants are reported in lbs/day*

Emission Reductions Methodology:
These emissions reductions were estimated by considering the reductions which could be achieved by small and medium gas turbines. Assuming that three small turbines achieve 25 pm NOx, the emissions reductions would be 140 lb/day. For medium turbines, assuming that six

achieve 5 ppm NOx, the reductions would be 1,360 lb/day. As a result, the total emissions reductions are estimated to be approximately 1,500 lb/day.

SS23: BIOGAS FLARES

Emission Reductions:

Pollutants*	2020	2030
NO_x	920	920
CO	2,940	2,940

**criteria pollutants are reported in lbs/day*

Emission Reductions Methodology:
The majority of emissions from biogas and non-refinery flares come from flares subject to RACT level controls. If these flares were subjected to LAER controls, NOx would be reduced by 58 percent and CO would be reduced by 70 percent. According to the 2011 inventory, landfill flares account for 980 pounds per day of NO_X, and 3,220 pounds per day of CO. Therefore, implementation of this measure would yield potential emission reductions of 920 pounds per day of NO_X, and 2,940 pounds per day of CO.

SS28: LPG, PROPANE, BUTANE

Emission Reductions:

Pollutants*	2020	2030
ROG	5,000	5,000

**criteria pollutants are reported in lbs/day*

Emissions Reductions Methodology:
ROG fugitive emissions from LPG in the Bay Area are estimated to be approximately 7,200 pounds per day. With the proposals in this control measure, these would be expected to be reduced by about 70%, or approximately 5,000 pounds per day.

SS29: ASPHALTIC CONCRETE

Emission Reductions:

Pollutants*	2020	2030
ROG	400	400

**criteria pollutants are reported in lbs/day*

Emissions Reductions Methodology:
Current emissions estimated for emulsified asphalt is 600 pounds of ROG per day. The control measure would reduce the solvent limit in cutback asphalt from 0.5% to 0.1%, and in emulsion asphalt from 3.0% to potentially as low as 0.1%. However, because a new limit would likely include some exemptions or solvents higher than 0.1%, staff conservatively estimated that emissions could be reduced by 2/3, which would be a reduction of 400 lb/day. Actual reductions could be higher, depending on the specific details of the new limit.

SS30: RESIDENTIAL FAN-TYPE FURNACES

Emission Reductions:

Pollutants*	2020	2030
NO_x	13,200	13,200

**criteria pollutants are reported in lbs/day*

Emission Reductions Methodology:
Because the amended rule will apply only to new devices, and because central furnaces have an average life of about 20 years, the emission reductions from this measure will be phased in as existing furnaces are replaced. Emissions reductions will be 12,000 to 14,400 pounds per day after the measure is fully implemented (emission reductions in the table above represent an average of these two estimates). This estimate is based on a 65 percent reduction (14 ng/joule versus 40 ng/joule) of the 2011 NO_X inventory for domestic space heating using natural gas fuel (17,220 pounds/day), plus some portion of commercial natural gas use (4,820 pounds/day). The inventory also includes industrial natural gas use (5,880 pounds/day), but this is assumed to not be used for space heating.

SS31: GENERAL PARTICULATE MATTER EMISSION LIMITATION
NOTE: These emissions reductions have been updated and revised from the estimates contained in the 2017 Plan.

Emission Reductions:

Pollutants*	2020	2030
$PM_{2.5}$	300	300
PM_{10}	600	600

**criteria pollutants are reported in lbs/day)*

Emission Reductions Methodology:
The emissions reductions above were conservatively calculated only for the four BART car cleaning stations, which are the largest facilities that would be affected by this control measure. Adding baghouses or electrostatic precipitators would reduce total suspended particulate (TSP) and PM_{10} emissions at each of these facilities by 210 pounds per day. The facilities operate five days per week, and the emissions reductions are averaged out over a seven-day week. Approximately half of these estimated 600 pounds of TSP and PM_{10} reductions would consist of $PM_{2.5}$

SS32: EMERGENCY BACK-UP GENERATORS

Emission Reductions:

Pollutants*	2020	2030
CO_{2e}	0	1.8

**CO_{2e} is reported in metric tons/year (100 yr GWP)*

Emission Reductions Methodology:
Emissions reductions from back-up generators were estimated by assuming that replacement of old generators with newer, cleaner generators, including solar-powered generators, could reduce emissions by approximately 25% from current emission levels.

SS34: WOOD SMOKE

Emission Reductions:

Pollutants*	2020	2030
$PM_{2.5}$	60	60

**criteria pollutants are reported in lbs/day*

Emission Reductions Methodology:
$PM_{2.5}$ emissions from wood smoke are estimated to average 34,000 pounds per day during the winter season. During Winter Spare the Air Alerts, when Rule 6-3 restrictions are in effect, $PM_{2.5}$ emissions from wood smoke are approximately 720 pounds per day. Complete ban of wood burning during Winter Spare the Air Alerts will reduce $PM_{2.5}$ emissions by 60 pounds per day for each Winter Spare the Air Alerts are in effect (typically 15 – 25 nights each winter), or approximately 72,000 pounds per year.

SS35: PARTICULATE MATTER FROM BULK MATERIAL STORAGE, HANDLING AND TRANSPORT, INCLUDING COKE AND COAL

Emission Reductions:

Pollutants*	2020	2030
$PM_{2.5}$	4	4
PM_{10}	32	32

**criteria pollutants are reported in lbs/day*

Emission Reductions Methodology:
PM emissions of fugitive dust from coke and coal storage and handling operations are currently estimated to be 0.21 tpd TSP, 0.064 tpd PM10, and 0.007 tpd PM2.5. Controls for fugitive dust include enclosures or wind brakes to reduce wind-blown dust, and water sprays or wetting agents to improve moisture content and bind silt to the bulk coke or coal. Enclosures with secondary controls (baghouses) of dust emissions are 95 percent effective. Wind screens and water sprays may be more practical for existing facilities, and are expected to be 50 – 75 percent effective. Based on conservative assumption that control requirements are applied to 50 percent of sources, emission reductions are estimated to be 32 pounds/day PM10, and 4 pounds per day PM2.5.

SS36: PARTICULATE MATTER FROM TRACKOUT

NOTE: These emissions reductions have been updated and revised from the estimates contained in the 2017 Plan.

Emission Reductions:

Pollutants*	2020	2030
$PM_{2.5}$	360	360

**criteria pollutants are reported in lbs/day*

Emission Reductions Methodology:

Currently, the 2011 Emissions inventory indicates the following emissions from road dust on paved local streets: 16.7 tons per day (tpd) TSP, 9.8 tpd PM10, 5.8 tpd PM2.5. Road dust from freeways, major roads, or collector roads were not included since bulk material sites and other disturbed surface sites typically don't exit directly on these types of roads. These emission reduction estimates assume that 50% of local road dust comes from track-out, and that better enforcement will reduce that road dust by 25%. As a result, there would be a 12.5% reduction in road dust on local roads, resulting in a reduction of 2.69 tpd TSP (5,380 lb/day), 1.23 tpd PM10 (2,460 lb/day), and 0.18 tpd PM2.5 (360 lb/day).

SS37: PARTICULATE MATTER FROM ASPHALT OPERATIONS

Emission Reductions:

Pollutants*	2020	2030
$PM_{2.5}$	175	175

**criteria pollutants are reported in lbs/day*

Emission Reductions Methodology:

PM emissions of blue smoke from paving asphalt operations are estimated to be 240 pounds per day $PM_{2.5}$ (50 pounds per day from each of three large paving asphalt plants) for approximately eight months of the year (during the paving season). Similarly, PM emissions of blue smoke from chip seal operations are estimated to be 120 pounds per day of $PM_{2.5}$ for six months of the year. Controls for blue smoke emissions from these sources are expected to be 75 percent effective, resulting in emission reductions of 270 pounds per day of $PM_{2.5}$ or 30 tons per year (tpy). PM emissions of smoke and fumes from roofing asphalt is estimated to be 250 pounds per day, and control from the polymer in low fuming asphalt is conservatively expected to be 70 percent, resulting in emission reductions of 175 pounds per day of $PM_{2.5}$ for approximately 8 months each year (21 tpy).

TR14: CARS & LIGHT TRUCKS

Emission Reductions:

Pollutants*	2020	2030
ROG	84	64
NO_x	84	64
$PM_{2.5}$	16	14
PM_{10}	17	15
DPM	-	-
TACs	-	-
CO_{2e}	4,566	3,963

**criteria pollutants and TACs are reported in lbs/day; CO_{2e} is reported in metric tons/year*

Emission Reductions Methodology:

Emission reductions for this measure have been calculated for the years 2016 through 2030, and are based only on the Air District's and MTC's ongoing incentives for new fleet vehicles and the Vehicle Buy-back Program. For new vehicle purchases, the annual VMT is assumed to be 15,000 miles.

Emission reductions were calculated by assuming that each ZEV and PHEV will be purchased in lieu of an average brand new gasoline powered vehicle. For zero emission vehicles, the emission reductions are calculated as the difference between new vehicle emissions and zero emissions in the years 2016 through 2030. For these estimates, we assume that during the 15 year period, older vehicles are retired and replaced like-for-like with new vehicles, and the new vehicles remain in operation during the entire period. That is, a vehicle purchased in 2017 would still be in operation in 2030. Because new standards haven't yet been adopted for MY 2026-2030, we assume that new gasoline and PHEV vehicles meet the existing SULEV20 standard.

For plug-in hybrid vehicles, it is assumed that the vehicles will be certified by ARB as Super Ultra Low Emission Vehicles and will operate in electric mode for 50 percent of the annual VMT, or 7,500 miles. For PHEV's, we have assumed that 75 percent of the electricity used by the vehicles will come from grid-electricity, while the remaining 25 percent of the electricity comes from burning gasoline in the vehicle engine.

TR19: MEDIUM- AND HEAVY-DUTY TRUCKS

Emission Reductions:

Pollutants*	2020	2030
ROG	53	44
NO_x	2,278	362
$PM_{2.5}$	4	10
PM_{10}	4	11
DPM	4	10
CO_{2e}	58,234	138,306

**criteria pollutants and TACs are reported in lbs/day; CO_{2e} is reported in metric tons/year*

Emission Reductions Methodology:
Because of the complexity of the incentive programs for heavy-duty trucks, the emissions reductions are based on the replacement of 2,500 medium- and heavy-duty (> 10,000 lbs) trucks with new zero emission trucks, at an average rate of approximately 180 trucks per year. The trucks are assumed to average 40,000 miles per year. Baseline emission factors for criteria pollutants are taken from ARB's Appendix D, Carl Moyer Program, 6/29/15. Emission factors for CO_2 are from EMFAC 2014. We assume that between 2017 and 2022, the replaced trucks were built before 2010, while between 2023 and 2030, the replaced trucks are MY 2010 or newer. Potential emissions reduction benefit from short-term truck demonstrations have not been included in the emissions estimates due to the uncertain nature of the cost and implementation timelines.

TR20: SHIPS - OCEAN-GOING MARINE VESSELS

Emission Reductions:

Pollutants*	2020	2030
NO_x	75	38

**criteria pollutants and TACs are reported in lbs/day*

Emission Reductions Methodology:
For the purposes of estimating emission reductions from a Green Ports program, Air District staff assumed that by 2020, the incentives would be sufficient to attract 100 Tier 2 compliant and 50 Tier 3 compliant vessels to Bay Area ports. Vessels are assumed to be container ships that remain in the Bay for 24 hours, proceed directly to and from the assigned berth for a total transit time of 2 hours, operate on fuel compliant with ARB's low-sulfur fuel rule, and are connected to shore power while at berth. Each vessel is assumed to have a main engine rated at 43,000 kilowatts, and each vessel is assumed to produce the current average emissions. Using these assumptions, the emissions were calculated by determining the difference in emissions between current emissions and the estimated emissions if 100 ships were replaced with Tier 2 compliant vessels and 50 ships were replaced with Tier 3 compliant vessels.

TR23: LAWN CARE EQUIPMENT

Emission Reductions:

Pollutants*	2020	2030
ROG	1,134	2,835
NO_x	32	315
$PM_{2.5}$	63	630
CO_{2e}	8,742	21,854

**criteria pollutants and TACs are reported in lbs/day; CO_{2e} is reported in metric tons/year*

Emission Reductions Methodology:

For the purposes of estimating cumulative reductions achieved by 2020 and 2030, it is assumed that the incentive program will expend $500,000 per year to encourage the purchase of 2,000 new, zero emission electric or mechanical instead of new gasoline powered pieces of equipment. The emission reduction estimates in the table above represent the amount of avoided emissions because 8,000 zero emission pieces will be in use in the year 2020 and 20,000 in the year 2030 due to the provision of the Air District's incentive funding. (It is assumed for these calculations that the equipment purchased between 2017 and 2020 will be retired by 2030.) Emission reductions are based on the average new gasoline equipment have small engines rated at 7 hp, consume an average of 0.3 gallons of gasoline per day and operate 1.4 hours on a typical day, and met ARB emission standards for engines manufactured beginning in 2008.

WA1: LANDFILLS

Emission Reductions:

Pollutants*	2020	2030
ROG	400	400
CO_{2e}	233,308	233,308

**criteria pollutants are reported in lbs/day; CO_{2e} is reported in metric tons/year (100 yr GWP)*

Emission Reductions Methodology:

In calculating fugitive emissions from landfills, Air District staff currently assumes that gas collection systems collect 75 percent of both methane and NMOC, and that 25 percent of the landfill gas escapes as fugitive emissions. In the California Air Resources Board's (ARB) Statement of Reasons for the LMCM, ARB has indicated that compliance with the measure will result in 85 percent capture. Amending Rule 8-34 to be consistent with or more stringent than CARB requirements for both methane and NMOC would lead to greater rates of gas collection and would result in emission reductions on the order of 18.8 tons per day of methane and 400 pounds per day ROG. The reduction in methane emissions result in GHG emission reductions equivalent to 590,132 MT C02e per year, on a 20-year timeframe, and 233,308 MT CO_2e per year, on a 100-year timeframe.