3.7 Greenhouse Gas Emissions

This section describes the regulatory and environmental setting concerning greenhouse gas emissions in the program and individual project areas. It also describes impacts on greenhouse gas (GHG) emissions that could result from implementation of the program and the two individual projects. Mitigation measures are prescribed where feasible and appropriate.

GHGs are considered separately from the air quality analysis in this PEIR, based on the consensus of climate scientists in California and elsewhere that although most GHGs are classed as air pollutants (see following descriptions of case law), the environmental consequences of GHGs for climate change considerations are substantially different and another order of magnitude as compared to criteria pollutants addressed in Chapter 3.3 *Air Quality*.

GHGs are deemed to contribute to climate change, including alterations in wind patterns, storms, precipitation, and temperature, based on historical records of temperature changes occurring in the past, such as during previous ice ages. This chapter describes first the regulatory setting applicable to the evaluation of the project and its generation of GHGs (almost exclusively during construction), then describes the environmental or physical nature of GHGs and climate change, before providing an analysis of the program and the subject projects and their effects regarding the generation of GHGs.

3.7.1 Existing Conditions

Regulatory Setting

This section summarizes federal, state, and local regulations related to GHG emissions and climate change that are applicable to the program and the Golden Hills and Patterson Pass Projects.

Federal

Massachusetts, et al. vs. U.S. Environmental Protection Agency (2007)

Twelve U.S. states and cities including California, in conjunction with several environmental organizations, sued to force EPA to regulate GHGs as a pollutant pursuant to the CAA in *Massachusetts, et al. v. Environmental Protection Agency* (549 US 497 [2007]). The court ruled that the plaintiffs had standing to sue, GHGs fit within the CAA's definition of a pollutant, and EPA's reasons for not regulating GHGs were insufficiently grounded in the CAA.

Mandatory Greenhouse Gas Reporting Rule (2009)

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

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

On December 7, 2009, EPA signed the Endangerment and Cause or Contribute Findings for Greenhouse Gases under Section 202(a) of the CAA. Under the Endangerment Finding, EPA finds that the current and projected concentrations of the six key well-mixed GHGs—carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), perfluorinated carbons (PFCs), sulfur hexafluoride (SF_6), and hydrofluorocarbons (HFCs)—in the atmosphere threaten the public health and welfare of current and future generations. Under the Cause or Contribute Finding, EPA finds that the combined emissions of these well-mixed GHGs from new motor vehicles and new motor vehicle engines contribute to the GHG pollution that threatens public health and welfare.

These findings do not themselves impose any requirements on industry or other entities. However, this action is a prerequisite to finalizing EPA's proposed new corporate average fuel economy standards for light-duty vehicles, which EPA proposed in a joint proposal including the Department of Transportation's proposed corporate average fuel-economy standards. EPA is still currently in its rule development process for the updated light-duty standards, and recently released responses to comments submitted during the comment period for the updated light-duty standards.

Council on Environmental Quality Draft NEPA Guidance (2010)

On February 19, 2010, the Council on Environmental Quality (CEQ) issued draft National Environmental Policy Act (NEPA) guidance on the consideration of the effects of climate change and GHG emissions. This guidance advises federal agencies that they should consider opportunities to reduce GHG emissions caused by federal actions, adapt their actions to climate change effects throughout the NEPA process, and address these issues in their agency NEPA procedures. Where applicable, the scope of the NEPA analysis should cover the GHG emissions effects of a proposed action and alternative actions, as well as the relationship of climate change effects on a proposed action or alternatives. The draft guidance suggests that the effects of projects directly emitting GHGs in excess of 25,000 tons annually be considered in a qualitative and quantitative manner. The CEQ does not propose this reference as a threshold for determining significance, but as "a minimum standard for reporting emissions under the CAA." The draft guidance also recommends that the cumulative effects of climate change on the proposed project be evaluated. The CEQ guidance is still considered draft as of the writing of this document and is not an official CEQ policy document (Council on Environmental Quality 2010).

Update to Corporate Average Fuel Economy Standards (2009)

The new Corporate Average Fuel Economy (CAFE) standards incorporate stricter fuel economy standards promulgated by the State of California into one uniform standard. Additionally, automakers are required to cut GHG emissions in new vehicles by roughly 25% by 2016. EPA, National Highway Traffic Safety Administration (NHTSA), and ARB have established GHG emissions standards for 2017 to 2025 model year passenger vehicles, which require an industry-wide average of 54.5 miles per gallon in 2025 (U.S. Environmental Protection Agency et al. 2011a). The official proposal was released by both EPA and NHTSA on December 1, 2011. The public comment period ended on February 13, 2012 (U.S. Environmental Protection Agency et al. 2011b). The rule was finalized by the NHTSA on August 28, 2012 (National Highway Traffic Safety Administration 2012).

United States Environmental Protection Agency Regulation of GHG Emissions under the Clean Air Act (2010–2012, ongoing)

Under the authority of the Clean Air Act, EPA is beginning to regulate GHG emissions starting with large stationary sources. In 2010, EPA set GHG thresholds to define when permits under the New Source Review Prevention of Significant Deterioration (PSD) and Title V Operating Permit programs are required for new and existing industrial facilities. In 2012, EPA proposed a carbon pollution standard for new power plants.

State

Executive Order S-3-05 (2005)

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

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

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

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

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

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

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

EPA and ARB have adopted a joint rulemaking to establish GHG emissions standards for 2017 to 2025 model-year passenger vehicles. The Interim Joint Technical Assessment Report for the standards evaluated four potential future standards ranging from 47 to 62 miles per gallon in 2025. The official proposal was released by both EPA and ARB on December 7, 2011, and was unanimously approved by ARB on January 26, 2012 (California Air Resources Board 2012a). The rule was finalized by the NHTSA on August 28, 2012 (National Highway Traffic Safety Administration 2012).

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

AB 32 codified the State's GHG emissions target by requiring that the State's global warming emissions be reduced to 1990 levels by 2020. Since being adopted, ARB, CEC, the California Public Utilities Commission (CPUC), and the Building Standards Commission have been developing regulations that will help meet the goals of AB 32 and EO S-03-05. The Scoping Plan for AB 32 identifies specific measures to reduce GHG emissions to 1990 levels by 2020, and requires ARB and other State agencies to develop and enforce regulations and other initiatives for reducing GHGs. Specifically, the Scoping Plan articulates a key role for local governments, recommending they establish GHG reduction goals for both their municipal operations and the community consistent with those of the State (i.e., approximately 15% below current levels).

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

EO S-01-07 mandates (1) that a statewide goal be established to reduce the carbon intensity of California's transportation fuels by at least 10% by 2020, and (2) that a low-carbon fuel standard (LCFS) for transportation fuels be established in California. The EO initiates a research and regulatory process at ARB. Based on an implementation plan developed by CEC, ARB will be responsible for implementing the LCFS. On December 29, 2011, a federal judge issued a preliminary injunction blocking enforcement of the LCFS, ruling that the LCFS violates the interstate commerce clause (Georgetown Climate Center 2012). On April 13, 2012, a stay on the injunction was granted while the court considers ARB's appeal, allowing ARB to continue to implement and resume enforcement of LCFS (California Air Resources Board 2012b).

Senate Bill 375—Sustainable Communities Strategy (2008)

SB 375 provides for a new planning process that coordinates land use planning, regional transportation plans, and funding priorities in order to help California meet the GHG reduction goals established in AB 32. SB 375 requires regional transportation plans developed by metropolitan planning organizations (MPOs) to incorporate a "sustainable communities strategy" (SCS) in their Regional Transportation Plans (RTPs). The goal of the SCS is to reduce regional vehicle miles traveled (VMT) through land use planning and consequent transportation patterns. The regional targets were released by ARB in September 2010. SB 375 also includes provisions for streamlined CEQA review for some infill projects such as transit-oriented development. However, those provisions will not become effective until an SCS is adopted.

California Energy Efficiency Standards for Residential and Non-Residential buildings—Title 24 (2008)

The CEC periodically updates the energy efficiency requirements for residential and non-residential buildings. The currently applicable standards were adopted in 2008. The next standards were adopted in late May, 2012 and come into force in 2014.

California Green Building Standards Code—Title 24, Part 11 (2011)

On July 17, 2008, the California Building Standards Commission adopted the nation's first green building standards. The California Green Building Standards Code (proposed Part 11, Title 24) was adopted as part of the California Building Standards Code (24 CCR). Part 11 establishes voluntary standards that became mandatory in the 2010 edition of the code, including planning and design for sustainable site development, water conservation, material conservation, and internal air contaminants. The standards took effect in January 1, 2011. The standards did not mandate improvements in energy efficiency above the Title 24 2008 standards.

Climate Change Scoping Plan (2008)

On December 11, 2008, pursuant to AB 32, ARB adopted the Climate Change Scoping Plan. This plan outlines how emissions reductions from significant sources of GHGs will be achieved through regulations, market mechanisms, and other actions. The Climate Change Scoping Plan also describes recommended measures that were developed to reduce GHG emissions from key sources and activities while improving public health, promoting a cleaner environment, preserving our natural resources, and ensuring that the impacts of the reductions are equitable and do not disproportionately affect low-income and minority communities. These measures put the state on a path to meet the long-term 2050 goal of reducing California's GHG emissions to 80% below 1990 levels.

State CEQA Guidelines (2010)

The State CEQA Guidelines require lead agencies to describe, calculate, or estimate the amount of GHG emissions that would result from a project. Moreover, the State CEQA Guidelines emphasize the need to determine potential climate change effects of the project and propose mitigation as necessary. The State CEQA Guidelines confirm the discretion of lead agencies to determine appropriate significance thresholds, but require the preparation of an EIR if "there is substantial evidence that the possible effects of a particular project are still cumulatively considerable notwithstanding compliance with adopted regulations or requirements" (§15064.4).

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

Greenhouse Gas Cap-and-Trade Program (2010/2011)

The development of a Cap-and-Trade program was included as a key reduction measure of ARB's AB 32 Climate Change Scoping Plan. The cap and trade emissions trading program developed by ARB took effect on January 1, 2012, with enforceable compliance obligations beginning January 1, 2013. The cap-and-trade program aims to regulate the greenhouse gas emissions from the largest producers in the state by setting a statewide firm limit, or cap, on the allowable annual GHGs. The cap contains three compliance phases. In compliance period one, large emitters from the electricity and industrial sector come under the cap. In the second period, which commences in 2015, fuels will

be subject to the cap. Compliance phase three includes all three sectors (electricity, industry, fuels) and runs until 2020.

Each sector receives GHG trading allowances in a different way. Electricity receives allowances from ARB through a blend of auctions and free allocations based on emissions. Industry, by contrast, receives allowances based on their efficiency relative to other capped companies in their sector (benchmarks). The cap, or amount capped entities are able to emit, will decrease over time (approximately 2–3% each year. Capped entities with more allowances than emissions may bank some allowances to cover future emissions or sell those allowances back to the market established under the program. Capped entities with emissions that exceed their allowances must purchase more allowances in order to comply with the program.

ARB administered the first auction on November 14, 2012, with many of the qualified bidders representing corporations or organizations that produce large amounts of GHG emissions, including energy companies, agriculture and food industries, steel mills, cement companies, and universities (California Air Resources Board 2012c). It is anticipated that the program will cover around 350 to 400 businesses or *capped entities*, including those headquartered out of state if they operate facilities in California.

Local

Bay Area Air Quality Management District

The BAAQMD is the regional agency with jurisdiction over air quality in the nine-county region located in the Bay Area Air Basin. In June 2010, the BAAQMD adopted an update to its *CEQA Air Quality Guidelines* (BAAQMD Guidelines) (Bay Area Air Quality Management District 2010a), which includes specific significance thresholds for GHG emissions. The BAAQMD's June 2010 adopted thresholds of significance, which were subsequently updated in May 2011, were challenged in a lawsuit. The court found that the adoption of the thresholds was a project under CEQA and ordered the Air District to examine whether the thresholds would have a significant impact on the environment under CEQA before recommending their use. On August 13, 2013, the Court of Appeal of the State of California reversed the superior court's judgment, indicating that the 2011 thresholds do not represent a project under CEQA and could therefore go into effect without CEQA review (*California Building Industry Association v. Bay Area Air Quality Management District*). Consequently, this document uses the 2011 thresholds to determine significance (Bay Area Air Quality Management District 2011).

The County as lead agency has independently reviewed the BAAQMD's proposed thresholds and determined that they are supported on substantial evidence and are appropriate for use to determine significance in the environmental review of this project. Specifically, the County has determined that the BAAQMD thresholds are well-grounded on air quality regulations, scientific evidence, and scientific reasoning concerning air quality and GHG emissions. Using these thresholds for the program also allows a rigorous standardized approach to determining whether the program would cause a significant air quality impact. BAAQMD's Justification Report explains the agency's reasoning for adopting the thresholds (Bay Area Air Quality Management District 2009).

BAAQMD recommends that the following measures be incorporated into all projects.

- Use alternative-fueled (e.g., biodiesel, electric) construction vehicles/equipment for at least 15% of the fleet.
- Use at least 10% local building materials.
- Recycle or reuse at least 50% of construction waste or demolition materials.

Alameda County

In June 2011, the Alameda County Board of Supervisors approved a Final Draft Climate Action Plan (CCAP) for the unincorporated areas of Alameda County. The goal of this plan is to reduce Countywide GHG emissions by 15% by the year 2020. The Final Draft CCAP includes measures to reduce GHG emissions from the following activities.

- Transportation (e.g., bicycle infrastructure and transit service).
- Planning (e.g., encouraging high-density development and mixed-use development).
- Water conservation (e.g., water-efficient appliances and rainwater use).
- Waste diversion (e.g., improve services for recycling and composting).
- Building energy use (e.g., energy retrofits).
- Green infrastructure (e.g., urban forest expansion).

An environmental review was completed under CEQA for the CCAP to identify any significant impacts on the environment, and, how those impacts may be mitigated. The Negative Declaration and Initial Study prepared by County planning staff indicates that the General Plan Amendment and adoption of the CCAP would have no significant environmental impacts in any category of environmental issue reviewed. The CCAP, General Plan Amendment and Negative Declaration were adopted by the Board of Supervisors on February 4, 2014, and the CCAP is now in effect and part of the County General Plan.

Environmental Setting

Climate Change

The phenomenon known as the *greenhouse effect* keeps the atmosphere near the Earth's surface warm enough for the successful habitation of humans and other life forms. Present in the Earth's lower atmosphere, GHGs play a critical role in maintaining the Earth's temperature; GHGs trap some of the long-wave infrared radiation emitted from the Earth's surface that would otherwise escape to space. According to AB 32, California's Global Warming Solutions Act, GHGs encompass the following gases: CO_2, CH_4, N_2O, PFCs, SF_6, and HFCs. State CEQA Guidelines (Section 15364.5) also identify these six gases as GHGs. GHGs not defined by AB 32 include water vapor, ozone, and aerosols. Water vapor is an important component of our climate system and is not regulated. Ozone and aerosols are short-lived GHGs; global warming potentials for short-lived GHGs are not defined by the IPCC. Aerosols can remain suspended in the atmosphere for about a week and can warm the atmosphere by absorbing heat and cool the atmosphere by reflecting light. Black carbon is a type of aerosol that can also cause warming from deposition on snow.

Visible sunlight passes through the atmosphere without being absorbed. Some of the sunlight striking the Earth is absorbed and converted to heat, which warms the surface. The surface emits infrared radiation to the atmosphere, where some of it is absorbed by GHGs and re-emitted toward the surface; some of the heat is not trapped by GHGs and escapes into space. Human activities that emit additional GHGs to the atmosphere increase the amount of infrared radiation that gets absorbed before escaping into space, thus enhancing the greenhouse effect and amplifying the warming of the Earth (Center for Climate and Energy Solutions 2012).

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

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

Principal Greenhouse Gases

The primary GHGs generated by the alternatives would be CO_2, CH_4, N_2O, and SF_6. Each of these gases is discussed in detail below. Note that PFCs and HFCs are not discussed as these gases are primarily generated by industrial processes, which are not anticipated as part of the project.

To simplify reporting and analysis, methods have been set forth to describe emissions of GHGs in terms of a single gas. The most commonly accepted method to compare GHG emissions is the global warming potential (GWP) methodology defined in the IPCC reference documents (Intergovernmental Panel on Climate Change 2007). The IPCC defines the GWP of various GHG emissions on a normalized scale that recasts all GHG emissions in terms of CO_2 equivalent (CO_2e), which compares the gas in question to that of the same mass of CO_2 (CO_2 has a global warming potential of 1 by definition).

Table 3-7.1 lists the global warming potential of CO_2, CH_4, N_2O, and SF_6; their lifetimes; and abundances in the atmosphere.

Table 3.7-1. Lifetimes and Global Warming Potentials of Several Greenhouse Gases

Greenhouse Gases	Global Warming Potential (100 years)	Lifetime (years)	2005 Atmospheric Abundance
CO_2 (ppm)[a]	1	50–200	379
CH_4 (ppb)	25	12	1,758–1,874
N_2O (ppb)	298	114	323–324
HFC-23 (ppt)	14,800	270	18
HFC-134a (ppt)	1,430	14	64
HFC-152a (ppt)	124	1.4	3.9
SF_6 (ppt)[a]	22,800	3,200	7.1–7.5

Sources: Intergovernmental Panel on Climate Change 2007b; Carbon Dioxide Information Analysis Center 2013; National Oceanic and Atmospheric Administration 2013.

CF = hydrofluorocarbons.
CH_4 = methane.
CO_2 = carbon dioxide.
N_2O = nitrous oxide.
ppb = parts per billion.
ppm = parts per million by volume.
ppb = parts per billion by volume.
ppt = parts per trillion by volume.

Carbon Dioxide

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

Atmospheric CO_2 has increased from a pre-industrial concentration of 280 ppm to 379 ppm in 2005 (Intergovernmental Panel on Climate Change 2007b) and is currently at 397 ppm as of December 2013 (National Oceanic and Atmospheric Administration 2013).

Methane

CH_4, the main component of natural gas, is the second most abundant GHG and has a GWP of 25 (Intergovernmental Panel on Climate Change 2007b). Sources of anthropogenic emissions of CH_4 include growing rice, raising cattle, using natural gas, landfill outgassing, and mining coal (National Oceanic and Atmospheric Administration 2010). Certain land uses also function as a both a source and sink for CH_4. For example, wetlands are a terrestrial source of CH_4, whereas undisturbed, aerobic soils act as a CH_4 sink (i.e., they remove CH_4 from the atmosphere).

Atmospheric CH_4 has increased from a pre-industrial concentration of 715 ppb to up to 1,874 ppb in 2005 (National Oceanic & and Atmospheric Administration 2013). Recent measurements indicate that atmospheric CH_4 reached a concentration of nearly 1,800 ppb in 2010 (European Environmental Agency 2013a).

Nitrous Oxide

N_2O is a powerful GHG, with a GWP of 298 (Intergovernmental Panel on Climate Change 2007b). Anthropogenic sources of N_2O include agricultural processes (e.g., fertilizer application), nylon production, fuel-fired power plants, nitric acid production, and vehicle emissions. N_2O also is used in rocket engines, race cars, and as an aerosol spray propellant. Natural processes, such as nitrification and denitrification, can also produce N_2O, which can be released to the atmosphere by diffusion. In the U.S., more than 70% of N_2O emissions are related to agricultural soil management practices, particularly fertilizer application.

N_2O concentrations in the atmosphere have increased 18% from pre-industrial levels of 270 ppb to 319 ppb in 2005 (Intergovernmental Panel on Climate Change 2007b). Recent measurements indicate that atmospheric N_2O reached a concentration of nearly 324 ppb in 2010 (European Environmental Agency 2013b).

Sulfur Hexafluoride

SF_6, a human-made chemical, is used as an electrical insulating fluid for power distribution equipment, in the magnesium industry, in semiconductor manufacturing, and also as a tracer chemical for the study of oceanic and atmospheric processes (U.S. Environmental Protection Agency 2013a). In 2005, atmospheric concentrations of SF_6 were up to 7.5 parts per trillion (ppt) and steadily increasing in the atmosphere. SF_6 is the most powerful of all GHGs listed in IPCC studies, with a GWP of 22,800 (Intergovernmental Panel on Climate Change 2007b).

Greenhouse Gas Emissions Inventories

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

Table 3-7.2 outlines the most recent global, national, statewide, and local GHG inventories to help contextualize the magnitude of potential project-related emissions.

Table 3.7-2. Global, National, State, and Local GHG Emissions Inventories

Emissions Inventory	CO_2e (metric tons)
2004 IPCC Global GHG Emissions Inventory	49,000,000,000
2011 EPA National GHG Emissions Inventory	6,708,300,000
2010 ARB State GHG Emissions Inventory	451,600,000
2010 SFBAAB GHG Emissions Inventory	95,800,000
2005 Unincorporated Alameda County GHG Emissions Inventory	930,000

Sources: Intergovernmental Panel on Climate Change 2007a; U.S. Environmental Protection Agency 2013b; California Air Resources Board 2013; Bay Area Air Quality Management District 2010b; Alameda County 2011.

CO_2e = carbon dioxide equivalent.

Impacts of Climate Change

Climate change is a complex phenomenon that has the potential to alter local climatic patterns and meteorology. Although modeling indicates that climate change will result globally and regionally in sea level rise, changes in climate and rainfall, and other effects, there remains uncertainty with regard to characterizing the precise *local* climate characteristics and predicting precisely how various ecological and social systems will react to any changes in the existing climate at the local level. Regardless of this uncertainty in precise predictions, it is widely understood that substantial climate change is expected to occur in the future, although the precise extent will take further research to define.

Consequently, the program area will be affected by changing climatic conditions. Research efforts coordinated through ARB, CEC, California Environmental Protection Agency (CalEPA), the University of California system, and others are examining the specific changes to California's climate that will occur as the Earth's surface warms. Climate change could affect the natural environment in California in the following ways, among others.

- Rising sea levels along the California coastline, particularly in San Francisco and the San Joaquin Delta due to ocean expansion.
- Extreme-heat conditions, such as heat waves and very high temperatures, that could last longer and become more frequent.
- An increase in heat-related human deaths, infectious diseases and a higher risk of respiratory problems caused by deteriorating air quality.
- Reduced snowpack and stream flow in the Sierra Nevada Mountains, affecting winter recreation and water supplies.
- Potential increase in the severity of winter storms, affecting peak stream flows and flooding.
- Changes in growing season conditions that could affect California agriculture, causing variations in crop quality and yield.
- Changes in distribution of plant and wildlife species due to changes in temperature, competition from colonizing species, changes in hydrologic cycles, changes in sea levels, and other climate-related effects.

3.7.2 Environmental Impacts

Methods for Analysis

This section describes the methods and assumptions used to determine the direct and indirect impacts of the program and two individual projects and identifies the thresholds used to conclude whether an impact would be significant.

Baseline

The baseline conditions reflect the operation wind energy projects in the program area as a whole, including operations and maintenance-related vehicle trips and maintenance activities. The baseline year for the analysis of impacts associated with GHG emissions is 2013, when there were 3,100 units in production with a nameplate capacity of 316.4 MW producing approximately 550,000 megawatt-

hours per year (MWh/year) assuming a 20% capacity factor. This is the baseline used for evaluating indirect GHG emissions associated with program-generated electricity.

Emission Calculation Methods

GHG emissions were estimated for construction and operational activities at a programmatic level, with a finer level of analysis conducted for two specific repowering projects, Golden Hills and Patterson Pass. This analysis is restricted to GHGs identified by AB 32, which include carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. The program and the two projects would generate a variety of GHGs during construction and operation, including several defined by AB 32 such as carbon dioxide, methane, and nitrous oxide.

The program and the two projects may also emit GHGs s that are not defined by AB 32. For example, the project may generate aerosols. Aerosols are short-lived particles, as they remain in the atmosphere for about 1 week. Black carbon is a component of aerosol. Studies have indicated that black carbon has a high global warming potential; however, IPCC states that it has a low level of scientific certainty (Intergovernmental Panel on Climate Change 2007b). Water vapor could be emitted from evaporated water used for landscaping, but this is not a significant impact because water vapor concentrations in the upper atmosphere are primarily due to climate feedbacks rather than emissions from project-related activities. In addition, no introduced landscaping or irrigation is associated with either the program or the two projects, except as may be required on a very temporary basis for certain site restoration activities. The project would emit NO_X and VOCs, which are ozone precursors. Ozone is a GHG; however, unlike the other GHGs, ozone in the troposphere is relatively short-lived and can be reduced in the troposphere on a daily basis. Stratospheric ozone can be reduced through reactions with other pollutants.

Certain GHGs defined by AB 32 would not be emitted by the project. Perfluorocarbons and sulfur hexafluoride are typically used in industrial applications, none of which would be used by the repower. Therefore, it is not anticipated that either the program or the two projects would emit perfluorocarbons or sulfur hexafluoride.

An upstream emission source (also known as life cycle emissions) refers to emissions that were generated during the manufacture of products to be used for construction of a project. Upstream emission sources for the project include, but are not limited to, emissions from the manufacture of cement, emissions from the manufacture of steel, and/or emissions from the transportation of building materials to the material wholesaler. The upstream emissions were not estimated because they are not within the control of the project applicant and to do so would be speculative. Additionally, the California Air Pollution Control Officers Association White Paper on CEQA and climate change supports this conclusion by stating, “The full life-cycle of GHG [greenhouse gas] emissions from construction activities is not accounted for . . . and the information needed to characterize [life-cycle emissions] would be speculative at the CEQA analysis level” (California Air Pollution Control Officers Association 2008). Therefore, pursuant to State CEQA Guidelines Sections 15144 and 15145, upstream/ life-cycle emissions are speculative and no further discussion is necessary.

Emissions were calculated for a typical 80 MW repowering project using project data from the *Vasco Winds Repowering Project Draft Environmental Impact Report* (Contra Costa County 2010) because more specific data for repowering activities would not be available until project-level design is complete. These emissions were then scaled to the program area and the two project areas based on the relevant nameplate capacities. The scaling factors are as follows: 5.21 for program Alternative 1:

417 MW (416.5 MW nameplate capacity ÷ 80 MW metric nameplate capacity); 5.63 for program Alternative 2: 450 MW (450 MW nameplate capacity ÷ 80 MW metric nameplate capacity); 1.02 for the Golden Hills project (81.5 MW nameplate capacity [program buildout] ÷ 80 MW metric nameplate capacity); and 0.25 for the Patterson Pass project (19.8 MW nameplate capacity ÷ 80 MW metric nameplate capacity).

Construction emissions were estimated for each phase of construction for the following sources: offroad equipment, onroad vehicles (including truck trips and worker commutes), concrete batch plant operations, water consumption, and electricity use. Calculation methods from the following sources were used to estimate emissions: the California Emissions Estimator Model (CalEEMod) (South Coast Air Quality Management District 2011), the ARB EMission FACtors (EMFAC) 2011 model (California Air Resources Board 2013c), the Portland Cement Association (Portland Cement Association 2013), the California Air Pollution Control Officers Association (CAPCOA) GHG mitigation measure guidance document (California Air Pollution Control Officers Association 2010), and the Climate Registry (CR) (Climate Registry 2013a, 2013b). Additional standard emission factors, conversion factors, and methods were used to estimate emissions per standard GHG protocol consistent with BAAQMD guidance.

Operational emissions were estimated for offroad equipment (maintenance/operation activities), onroad vehicles (including truck trips and worker commutes), water consumption, electricity use, and circuit breaker leakage of sulfur hexafluoride (SF_6). Calculation methods from the same sources as for construction emissions were used to estimate operational emissions.

There will be a reduction in emissions associated with offsetting grid electricity with wind-generated electricity. This occurs because wind-generated energy is a renewable resource with zero GHG emissions associated with its production, and this energy replaces traditionally fossil fuel-derived electricity from the grid. As noted above, the capacity factor for existing turbines was assumed to be 20%. The program is anticipated to increase wind turbine efficiency by 50%, so a 30% capacity factor was used for the program turbines.

Stationary source emissions from fuel combustion at the batch plants were not estimated because specific data on the types of equipment (generators, engines, etc.) that will be used at the batch plants was not available. The cement used at the concrete batch plant is associated with indirect GHG emissions from its manufacture. CO_2 emissions are emitted during the combustion process as well as the calcination process when limestone is heated.[1] As the concrete ages, it carbonates, absorbing much of these CO_2 emissions. The manufacture of cement produces approximately 400 pounds (lbs) of CO_2 per cubic yard of concrete (60% calcination and 40% combustion) (Portland Cement Association 2013). However, over the lifetime of a concrete structure (100 years), approximately 57% of the CO_2 emitted during calcination will be reabsorbed into the limestone of the structure; roughly 7% of calcination emissions are absorbed during carbonation and 50% of calcination emissions will be absorbed once the structure is demolished and returned to fine particles (typically through recycling). To account for the partial reabsorption of CO_2 during the life of the structure, construction emissions generated by calcination (240 lbs CO_2/cy) were multiplied by 7% and included as an emissions sink under operational activities (16.8 lbs CO_2/cy).

[1] These emissions will occur at cement manufacturing facilities located outside of the program area, but are included in this analysis to provide as complete a picture as possible of indirect emissions associated with the Repowering Program.

Indirect GHG emissions from electricity used during construction and operation and for water delivery to the site were also estimated. The Pacific Gas & Electric (PG&E) emission factor for electricity deliveries for the year 2011 was used (392.9 lbs/MWh) to estimate emissions from electricity use (Climate Registry 2013b). To determine the amount of electricity needed to convey water to the project site, the CAPCOA energy intensity factor of 4,533 kWh/million gallons was used for conveyance of water from the State Water Project (California Air Pollution Control Officers Association 2010).

Important assumptions (associated with the 80 MW project Vasco example) used in the analysis are presented below (the same assumptions presented in Section 3.3, *Air Quality*, were used in this analysis).

- 10,500,000 gallons of water are required. This includes 500,000 gallons for concrete and incidental uses and 10,000,000 gallons for dust control.
- 4,500 kWh of electricity are consumed for construction
- 4,500 kWh of electricity are consumed annually for operational activities.
- 3,500 cubic yards of concrete are required.
- The CO_2 emission factors from EMFAC 2011 used for onroad vehicles do not include the influence of Pavley or the Low Carbon Fuel Standard (to present a conservative estimate of GHG emissions).

Determination of Significance

In accordance with Appendix G of the State CEQA Guidelines, program Alternative 1, program Alternative 2, the Golden Hills project, or the Patterson Pass project would be considered to have a significant effect if it would result in any of the conditions listed below.

- Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.
- Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

As mentioned above, the BAAQMD recently adopted an approach for assessing GHG-related impacts in CEQA review documents. The BAAQMD's 2010/2011 *CEQA Air Quality Guidelines* identify qualitative and quantitative operation-related thresholds of significance that can be applied to the significance criteria listed above. Note that climate change is a global problem, and GHGs are global pollutants, unlike criteria air pollutants (such as ozone precursors, which are primarily pollutants of regional and local concern). Given their long atmospheric lifetimes (see Table 3.7-1), GHGs emitted by countless sources worldwide accumulate in the atmosphere. No single emitter of GHGs is large enough to trigger global climate change on its own. Rather, climate change is the result of the individual contributions of countless past, present, and future sources. Therefore, GHG impacts are inherently cumulative. Consequently, the BAAQMD, as well as other jurisdictions and agencies, consider climate change to be a cumulative issue. Specifically, the BAAQMD indicates in their CEQA Guidelines:

> "If annual emissions of operational-related GHGs exceed these threshold levels, the proposed project would result in a cumulatively considerable contribution of GHG emissions and a

cumulatively significant impact to global climate change (Bay Area Air Quality Management District 2011)."

Consequently, the evaluation of climate change impacts in this analysis represents a cumulative analysis. Because the Court of Appeal of the State of California reversed the superior court's judgment challenging the 2010/2011 thresholds, the 2010/2011 thresholds are used to determine significance for construction and operational activities (Bay Area Air Quality Management District 2011).

According to the 2011 BAAQMD Guidelines, separate GHG thresholds are established for operational emissions from stationary sources and non-stationary sources. The stationary source threshold is 10,000 metric tons per year. For non-stationary sources, three separate thresholds are established.

- Compliance with Qualified GHG Reduction Strategy (i.e., if a project is found to be out of compliance with a Qualified GHG Reduction Strategy, its GHG emissions may be considered significant); or
- 1,100 metric tons of CO_2e per year; or
- 4.6 metric tons CO_2e per service population per year (service population is the sum of residents plus employees expected for a development project).

With the exception of minor GHG emissions that would be associated with substations, the program would primarily consist of non-stationary sources, such as those that would be generated during construction activities by trucks, grading equipment and cranes. For projects other than stationary sources, the proposed threshold is noncompliance with a qualified climate action plan or if it would result in annual operational emissions of more than 1,100 metric tons CO_2e per year. This threshold is more conservative than that for stationary sources (i.e., 10,000 metric tons CO_2e per year). Therefore, for the purposes of this analysis, project-related direct and indirect GHG emissions would be considered to result in a significant cumulative impact on the environment if the emissions would be more than 1,100 metric tons CO_2e per year.

The BAAQMD Guidelines do not identify an approach to assessing the significance of construction-related GHG emissions. However, the South Coast Air Quality Management District (SCAQMD) has adopted an approach for assessing construction emissions that includes amortizing construction emissions over the life span of the project, defined as 30 years, then adding those emissions to the operational emissions, and then comparing the combined emissions to the applicable GHG significance threshold (South Coast Air Quality Management District 2008). Therefore, in the absence of a BAAQMD-recommended approach for assessing construction GHG emissions, this analysis adopts the SCAQMD's recommended approach of amortizing construction emissions over a 30 year period and comparing combined construction and operational emissions to the applicable GHG significance threshold, which in this case is the BAAQMD non-stationary source threshold of 1,100 metric tons CO_2e per year.

Alameda County has recently adopted a qualified climate action plan for unincorporated Alameda County that would be applicable to the program. Based on the CCAP approved by the County Board of Supervisors, the program's and projects' potential to conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing emission of GHG is also assessed by examining any conflicts with the CCAP. It is also assessed by examining any conflicts with the GHG reduction goals set forth in AB 32, including the potential for the project to conflict with the 39 Recommended

Actions identified by ARB in its Climate Change Scoping Plan, which includes nine Early Action Measures.

Impacts and Mitigation Measures

Impact GHG-1a-1: Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment—program Alternative 1: 417 MW (less than significant)

Construction of the program would occur over a period of 9 months per year for approximately 4 years. It is estimated that there would be approximately 184 workdays per year that would include the use of heavy construction equipment. Construction activities at the project sites would be associated with decommissioning and foundation removal of existing turbine sites; laydown yards substations and switch yards; road construction; turbine foundations and batch plant operation; turbine delivery and installation; utility collector line installation; and restoration and clean up. Each of these activities would occur over periods that would range from approximately 2 to 4 months. It is estimated that as many as 90 pieces of offroad construction equipment, including cranes, excavators, graders, loaders, cement trucks, and bulldozers, would be required for an average of 8 hours per day to construct the program. At any given time, approximately 6 to 54 pieces of construction equipment would be operating, depending on the construction phasing.

In addition to the offroad equipment, onroad vehicle trips would be required to deliver materials and equipment to the construction sites and to transport workers to and from the construction sites. It is anticipated that an average of approximately 140 truck trips and 86 commuting worker trips would be required per day during the 9-month construction period for each year. It is anticipated that the majority of equipment- and material-related truck trips would originate at the Port of Stockton and in the City of Tracy and that the construction worker-related commute trips would occur entirely within the Bay Area. The portion of the equipment, material, and aggregate haul trips that would originate at the Port of Stockton and in the City of Tracy would be generated in the San Joaquin Valley, which is under the jurisdiction of the SJVAPCD. However, the SJVAPCD does not have thresholds for GHG emissions. Therefore, the heavy-duty truck trip exhaust emissions that would be generated in the San Joaquin Valley have been added to the Bay Area GHG emissions and compared to BAAQMD annual significance thresholds.

Total GHG emissions associated with construction of the program have been estimated and are presented in Table 3.7-3. As discussed above, construction GHG exhaust emissions were estimated using CalEEMod (South Coast Air Quality Management District 2011) and the EMFAC 2011 model (California Air Resources Board 2013c). In addition, indirect GHG emissions associated with water use for dust control were estimated for the program by employing emission factors and assumptions from the CAPCOA GHG mitigation measure guidance document (California Air Pollution Control Officers Association 2010), and the Climate Registry (CR) (Climate Registry 2013a, 2013b).

Operational GHG emissions above baseline would consist of SF_6 leakage. The proposed new circuit breaker would require the use of SF_6, which could leak during operation. It was assumed that the new circuit breaker would have a capacity of approximately 210 pounds of SF_6 (Contra Costa County 2010). EPA estimates that leaking circuit breakers manufactured in 1999 and later emit less than 1% of the SF_6 nameplate capacity (U.S. Environmental Protection Agency 2006). Considering this information, the program could emit up to approximately 2.6 pounds of SF_6 per year, which is equal to approximately 28.5 metric tons CO_2e per year. In addition, when the wind turbine generators are

not operating, the program could draw energy from the electricity grid to maintain security lighting, O&M building power, and communications equipment. Although this maintenance load would be substantially the same as for the existing wind energy facility, emissions from this electricity use during operations were calculated. Operational emissions are summarized in Table 3.7-3.

With respect to emissions from maintenance activities, the baseline includes maintenance activities, including maintenance vehicle trips, at the existing wind energy facility. Daily emissions associated with maintenance of the program would be similar, and thus the potential increase or decrease in maintenance-related emissions would be negligible. However, operational emissions from offsite worker trips, maintenance activities, and electricity use were estimated. Emission sinks from partial reabsorption of CO_2 during the life of the concrete structures were also included as an emissions sink for operational activities (Portland Cement Association 2013). These emissions are presented in Table 3.7-3.

Table 3.7-3. Program Construction and Operation GHG Emissions for the Bay Area

	Estimated Total Emissions (metric tons)				
Construction Activity	CO_2	CH_4	N_2O	SF_6	CO_2e
Construction Activity (all years)					
Decommissioning and foundation removal	1,810.79	0.11	0.05	0.00	1,827.88
Laydown yards substations and switch yards	1,174.69	0.07	0.03	0.00	1,186.13
Road construction	1,682.78	0.11	0.04	0.00	1,698.93
Turbine foundations and batch plant [a]	7,479.47	0.26	0.11	0.00	7,519.67
Turbine delivery and installation	1,153.94	0.07	0.03	0.00	1,164.92
Utility collector line installation	808.92	0.03	0.02	0.00	816.21
Restoration and clean up	589.02	0.04	0.01	0.00	594.49
Offsite truck trips	13,114.73	0.16	0.65	0.00	13,320.78
Offsite worker trips	884.67	0.01	0.02	0.00	892.55
Electricity use	4.17	0.00	0.00	0.00	4.20
Water use—indirect emissions	44.16	0.00	0.00	0.00	44.44
Total	28,747.34	0.88	0.98	0.00	29,070.21
Amortized (per year for 30 years)					969.01
Operational Activity (per year)					
Offsite worker trips	28.24	0.00	0.00	0.00	28.47
Maintenance/operation	78.91	0.01	0.00	0.00	79.70
Electricity use	1.00	0.00	0.00	0.00	1.01
Circuit breaker leakage	0.00	0.00	0.00	0.00	28.46
Concrete carbonation	-1.11	0.00	0.00	0.00	-1.11
Total	107.05	0.01	0.00	0.00	136.52

Construction Activity	Estimated Total Emissions (metric tons)				
	CO_2	CH_4	N_2O	SF_6	CO_2e
Total construction and operation emissions (per year)					1,105.52
Annual GHG reductions from offsetting grid electricity					-96,897.62
Annual net GHG emissions					-95,792.09
BAAQMD significance threshold					1,100
Significant impact?					No

[a] Includes direct emissions from construction activities for the construction phase along with indirect stationary CO_2 emissions associated with the manufacture of the concrete (offsite) used at the batch plants (onsite). Indirect emissions include fuel combustion emissions and calcination emissions.

As shown in Table 3.7-3, total GHG construction emissions in the form of CO_2e would be approximately 29,070 metric tons. These emissions amortized over a 30-year period equal approximately 969 metric tons per year. Adding to that the operation emissions of 137 metric tons CO_2e per year, total program GHG emissions would be approximately 1,106 metric tons CO_2e per year, which would be greater than the BAAQMD's significance threshold of 1,100 metric tons CO_2e per year for non-stationary sources. However, it should be noted that total program GHG emissions would be immaterial compared to the GHG emissions that would be avoided by the increased wind energy it will produce. By replacing older model turbines with new, more efficient ones, the program would reduce energy production-related contributions to climate change overall, relative to the existing facility, because it would contribute an additional 100 MW of nameplate capacity with turbines that are 50% more efficient than the existing turbines. The program would contribute approximately 540,000 MWh of additional wind-generated energy per year to the power grid compared to baseline conditions,[2] and would therefore replace the same amount of conventional (carbon-based) energy production. Using an emission factor of 329.9 pounds of CO_2e per MWh developed by PG&E for its current energy production portfolio (Climate Registry 2013b), it can be estimated that the program would result in an annual GHG emissions reduction of 96,898 metric tons CO_2e. Therefore, operation of the program would result in a net reduction of approximately 95,792 metric tons CO_2e per year and there would be no long-term impacts associated with GHG emissions generated by the program.

This impact would be less than significant.

Impact GHG-1a-2: Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment—program Alternative 2: 450 MW (less than significant)

Construction of program Alternative 2 would occur over a period of approximately 4 years. It is estimated that there would be approximately 184 workdays per year that would involve the use of heavy construction equipment. Construction activities would entail the same phases, construction equipment, and truck trips as listed above for the year-by-year implementation of the program.

Total GHG emissions associated with construction of Alternative 2 have been estimated and are presented in Table 3.7-4. As discussed above, construction GHG exhaust emissions were estimated using CalEEMod (South Coast Air Quality Management District 2011) and the ARB EMFAC 2011

[2] Calculation: 316.4 MW * 20% capacity * 8,760 hours per year = 554,280 MWh (baseline); 416.4 MW * 30% capacity * 8,760 hours per year = 1,094,562 MWh (Repowering Program). Difference = 540,282 MWh.

model (California Air Resources Board 2013c). In addition, indirect GHG emissions associated with water use for dust control were estimated for the project by employing emission factors and assumptions from the CAPCOA GHG mitigation measure guidance document (California Air Pollution Control Officers Association 2010), and the Climate Registry (CR) (Climate Registry 2013a, 2013b).

Operational GHG emissions above baseline would consist of SF_6 leakage; these emissions were quantified using the same methods as discussed for the program. Similar to the program, daily emissions associated with maintenance of the Golden Hills Project would be similar to baseline conditions, and thus the potential increase or decrease in maintenance-related emissions would be negligible. However, operational emissions from offsite worker trips, maintenance activities, and electricity use were estimated. Emission sinks from partial reabsorption of CO_2 during the life of the concrete structures were also included as an emissions sink for operational activities (Portland Cement Association 2013). These emissions are presented in Table 3.7-4.

Table 3.7-4. Program Alternative 2: Construction and Operation GHG Emissions for the Bay Area

	Estimated Total Emissions (metric tons)				
Construction Activity	CO_2	CH_4	N_2O	SF_6	CO_2e
Construction Activity (all years)					
Decommissioning and foundation removal	1,956.44	0.12	0.05	0.00	1,974.90
Laydown yards substations and switch yards	1,269.17	0.08	0.03	0.00	1,281.54
Road construction	1,818.13	0.12	0.05	0.00	1,835.58
Turbine foundations and batch plant [a]	8,081.06	0.28	0.12	0.00	8,124.49
Turbine delivery and installation	1,246.75	0.08	0.03	0.00	1,258.62
Utility collector line installation	873.98	0.04	0.02	0.00	881.86
Restoration and clean up	636.40	0.04	0.02	0.00	642.30
Offsite truck trips	14,169.57	0.18	0.71	0.00	14,392.20
Offsite worker trips	955.82	0.01	0.03	0.00	964.34
Electricity use	4.51	0.00	0.00	0.00	4.54
Water use—indirect emissions	47.71	0.00	0.00	0.00	48.02
Total	31,059.55	0.95	1.06	0.00	31,408.40
Amortized (per year for 30 years)					1,046.95
Operational Activity (per year)					
Offsite worker trips	28.24	0.00	0.00	0.00	28.47
Maintenance/operation	78.91	0.01	0.00	0.00	79.70
Electricity use	1.00	0.00	0.00	0.00	1.01
Circuit breaker leakage	0.00	0.00	0.00	0.00	28.46
Concrete carbonation	-1.11	0.00	0.00	0.00	-1.11
Total	107.05	0.01	0.00	0.00	136.52

Construction Activity	Estimated Total Emissions (metric tons)				
	CO_2	CH_4	N_2O	SF_6	CO_2e
Total construction and operation emissions (per year)					1,183.46
Annual GHG reductions from offsetting grid electricity					-112,686.92
Annual net GHG emissions					-111,503.46
BAAQMD significance threshold					1,100
Significant impact?					No

[a] Includes direct emissions from construction activities for the construction phase along with indirect stationary CO_2 emissions associated with the manufacture of the concrete (offsite) used at the batch plants (onsite). Indirect emissions include fuel combustion emissions and calcination emissions.

As shown in Table 3.7-4, total GHG construction emissions in the form of CO_2e would be approximately 31,408 metric tons. These emissions amortized over a 30-year period equal approximately 1,047 metric tons per year. Adding to that the operation emissions of 137 metric tons CO_2e per year, total program Alternative 2 GHG emissions would be approximately 1,183 metric tons CO_2e per year, which would be greater than the BAAQMD's significance threshold of 1,100 metric tons CO_2e per year for non-stationary sources. As described above, it should be noted that total program Alternative 2 GHG emissions would be immaterial compared to the GHG emissions that would be avoided by the increased production of wind energy under the Golden Hills Project. By replacing older model turbines with new, more efficient ones, program Alternative 2 would reduce energy production-related contributions to climate change overall, relative to the existing facility, because it would contribute approximately 150% more power to the grid by installing turbines that are 50% more efficient than the existing turbines. The project would contribute approximately 628,000 MWh of additional wind-generated energy per year to the power grid compared to baseline conditions,[3] and would therefore replace the same amount of conventional (carbon-based) energy production. Using an emission factor of 329.9 pounds of CO_2e per MWh developed by PG&E for its current energy production portfolio (Climate Registry 2013b), it can be estimated that program Alternative 2 would result in an annual GHG emissions reduction of 112,687 metric tons CO_2e. Therefore, operation of program Alternative 2 would result in a net reduction of approximately 111,503 metric tons CO_2e per year and there would be no long-term impacts associated with project-generated GHG emissions.

This impact would be less than significant.

Impact GHG-1b: Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment—Golden Hills Project (less than significant)

Construction of the Golden Hills Project would occur over a period of approximately 9 months. It is estimated that there would be approximately 184 workdays that would involve the use of heavy construction equipment. Construction activities would entail the same phases, construction equipment, and truck trips as listed above for the year-by-year implementation of the program, even though the overall construction activities at Golden Hills are much less than the program as a whole.

Total GHG emissions associated with construction of the Golden Hills Project have been estimated and are presented in Table 3.7-5. As discussed above, construction GHG exhaust emissions were

[3] Calculation: 316.4 MW * 20% capacity * 8,760 hours per year = 554,280 MWh (baseline); 450 MW * 30% capacity * 8,760 hours per year = 1,182,600 MWh (Repowering Program). Difference = 628,320 MWh.

estimated using CalEEMod (South Coast Air Quality Management District 2011) and the ARB EMFAC 2011 model (California Air Resources Board 2013c). In addition, indirect GHG emissions associated with water use for dust control were estimated for the project by employing emission factors and assumptions from the CAPCOA GHG mitigation measure guidance document (California Air Pollution Control Officers Association 2010), and the Climate Registry (CR) (Climate Registry 2013a, 2013b).

Operational GHG emissions above baseline would consist of SF_6 leakage; these emissions were quantified using the same methods as discussed for the program. Similar to the program, daily emissions associated with maintenance of the Golden Hills Project would be similar to baseline conditions, and thus the potential increase or decrease in maintenance-related emissions would be negligible. However, operational emissions from offsite worker trips, maintenance activities, and electricity use were estimated. Emission sinks from partial reabsorption of CO_2 during the life of the concrete structures were also included as an emissions sink for operational activities (Portland Cement Association 2013). These emissions are presented in Table 3.7-5.

Table 3.7-5. Golden Hills Project Construction and Operation GHG Emissions for the Bay Area

	Estimated Total Emissions (metric tons)				
Construction Activity	CO_2	CH_4	N_2O	SF_6	CO_2e
Construction Activity (all years)					
Decommissioning and foundation removal	354.33	0.02	0.01	0.00	357.68
Laydown yards substations and switch yards	229.86	0.01	0.01	0.00	232.10
Road construction	329.28	0.02	0.01	0.00	332.44
Turbine foundations and batch plant [a]	1,463.57	0.05	0.02	0.00	1,471.44
Turbine delivery and installation	225.80	0.01	0.01	0.00	227.95
Utility collector line installation	158.29	0.01	0.00	0.00	159.72
Restoration and clean up	115.26	0.01	0.00	0.00	116.33
Offsite truck trips	2,566.27	0.03	0.13	0.00	2,606.59
Offsite worker trips	173.11	0.00	0.00	0.00	174.65
Electricity use	0.82	0.00	0.00	0.00	0.82
Water use—indirect emissions	8.64	0.00	0.00	0.00	8.70
Total	5,625.23	0.17	0.19	0.00	5,688.41
Amortized (per year for 30 years)					189.61
Operational Activity (per year)					
Offsite worker trips	23.02	0.00	0.00	0.00	23.20
Maintenance/operation	64.31	0.01	0.00	0.00	64.95
Electricity use	0.82	0.00	0.00	0.00	0.82
Circuit breaker leakage	0.00	0.00	0.00	0.00	23.19
Concrete carbonation	-0.91	0.00	0.00	0.00	-0.91
Total	87.24	0.01	0.00	0.00	111.26
Total construction and operation emissions (per year)					300.87
Annual GHG reductions from offsetting grid electricity					-12,804.26
Annual net GHG emissions					-12,503.39

Construction Activity	Estimated Total Emissions (metric tons)				
	CO_2	CH_4	N_2O	SF_6	CO_2e
BAAQMD significance threshold					1,100
Significant impact?					No

[a] Includes direct emissions from construction activities for the construction phase along with indirect stationary CO_2 emissions associated with the manufacture of the concrete (offsite) used at the batch plants (onsite). Indirect emissions include fuel combustion emissions and calcination emissions.

As shown in Table 3.7-5, total GHG construction emissions in the form of CO_2e would be approximately 5,688 metric tons. These emissions amortized over a 30-year period equal approximately 190 metric tons per year. Adding to that the operation emissions of 111 metric tons CO_2e per year, total Golden Hills Project GHG emissions would be approximately 301 metric tons CO_2e per year, which would be less than the BAAQMD's significance threshold of 1,100 metric tons CO_2e per year for non-stationary sources.

It also should be noted that total Golden Hills GHG emissions would be immaterial compared to the GHG emissions that would be avoided by the increased production of wind energy under the Golden Hills Project. By replacing older model turbines with new, more efficient ones, the Golden Hills Project would reduce energy production-related contributions to climate change overall, relative to the existing facility, because it would contribute approximately 150% more power to the grid by installing turbines that are 50% more efficient than the existing turbines. The project would contribute approximately 71,000 MWh of additional wind-generated energy per year to the power grid compared to baseline conditions,[4] and would therefore replace the same amount of conventional (carbon-based) energy production. Using an emission factor of 329.9 pounds of CO_2e per MWh developed by PG&E for its current energy production portfolio (Climate Registry 2013b), it can be estimated that the Golden Hills Project would result in an annual GHG emissions reduction of 12,804 metric tons CO_2e. Therefore, operation of the Golden Hills Project would result in a net reduction of approximately 12,503 metric tons CO_2e per year and there would be no long-term impacts associated with project-generated GHG emissions.

This impact would be less than significant.

Impact GHG-1c: Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment—Patterson Pass Project (less than significant)

Construction of the Patterson Pass Project would occur over a period of approximately 9 months. It is estimated that there would be approximately 184 workdays that would include the use of heavy construction equipment. Construction activities at the project site would include the same phases, construction equipment, and truck trips as listed above for year-by-year implementation of the program, even though the overall construction activities at Patterson Pass are much less than the program as a whole.

Total GHG emissions associated with construction of the Patterson Pass Project have been estimated and are presented in Table 3.7-6. As discussed above, construction GHG exhaust emissions were estimated using CalEEMod (South Coast Air Quality Management District 2011) and the ARB EMFAC

[4] Calculation: 81.5 MW * 20% capacity * 8,760 hours per year = 142,788 MWh (baseline); 81.5 MW * 30% capacity * 8,760 hours per year = 214,182 MWh (Repowering Program). Difference = 71,394 MWh.

2011 model (California Air Resources Board 2013c). In addition, indirect GHG emissions associated with water use for dust control were estimated for the project by employing emission factors and assumptions from the CAPCOA GHG mitigation measure guidance document (California Air Pollution Control Officers Association 2010), and the Climate Registry (CR) (Climate Registry 2013a, 2013b).

Operational GHG emissions above baseline would consist of SF_6 leakage; these emissions were quantified using the same methods as discussed above for the program. As with the program, daily emissions associated with maintenance of the Patterson Pass Project would be similar to baseline conditions, and thus the potential increase or decrease in maintenance-related emissions would be negligible. However, operational emissions from offsite worker trips, maintenance activities, and electricity use were estimated. Emission sinks from partial reabsorption of CO_2 during the life of the concrete structures were also included as an emissions sink for operational activities (Portland Cement Association 2013). These emissions and are presented in Table 3.7-6.

Table 3.7-6. Patterson Pass Project Construction and Operation GHG Emissions for the Bay Area

	Estimated Total Emissions (metric tons)				
Construction Activity	CO_2	CH_4	N_2O	SF_6	CO_2e
Construction Activity (all years)					
Decommissioning and foundation removal	86.08	0.01	0.00	0.00	86.90
Laydown yards substations and switch yards	55.84	0.00	0.00	0.00	56.39
Road construction	80.00	0.01	0.00	0.00	80.77
Turbine foundations and batch plant [a]	355.57	0.01	0.01	0.00	357.48
Turbine delivery and installation	54.86	0.00	0.00	0.00	55.38
Utility collector line installation	38.46	0.00	0.00	0.00	38.80
Restoration and clean up	28.00	0.00	0.00	0.00	28.26
Offsite truck trips	623.46	0.01	0.03	0.00	633.26
Offsite worker trips	42.06	0.00	0.00	0.00	42.43
Electricity use	0.20	0.00	0.00	0.00	0.20
Water use—indirect emissions	2.10	0.00	0.00	0.00	2.11
Total	1,366.62	0.04	0.05	0.00	1,381.97
Amortized (per year for 30 years)					46.07
Operational Activity (per year)					
Offsite worker trips	5.59	0.00	0.00	0.00	5.64
Maintenance/operation	15.62	0.00	0.00	0.00	15.78
Electricity use	0.20	0.00	0.00	0.00	0.20
Circuit breaker leakage	0.00	0.00	0.00	0.00	5.63
Concrete carbonation	-0.22	0.00	0.00	0.00	-0.22
Total	21.20	0.00	0.00	0.00	27.03
Total construction and operation emissions (per year)					73.10
Annual GHG reductions from offsetting grid electricity					-3,110.73
Annual net GHG emissions					-3,037.63

Construction Activity	Estimated Total Emissions (metric tons)				
	CO_2	CH_4	N_2O	SF_6	CO_2e
BAAQMD significance threshold					1,100
Significant impact?					No

[a] Includes direct emissions from construction activities for the construction phase along with indirect stationary CO_2 emissions associated with the manufacture of the concrete (offsite) used at the batch plants (onsite). Indirect emissions include fuel combustion emissions and calcination emissions.

As shown in Table 3.7-6, total GHG construction emissions in the form of CO_2e would be approximately 1,382 metric tons. These emissions amortized over a 30-year period equal approximately 46 metric tons per year. Adding to that the operation emissions of 27 metric tons CO_2e per year, total Patterson Pass Project GHG emissions would be approximately 73 metric tons CO_2e per year, which would be less than the BAAQMD's significance threshold of 1,100 metric tons CO_2e per year for non-stationary sources.

It also should be noted that total Patterson Pass GHG emissions would be immaterial compared to the GHG emissions that would be avoided by the increased wind energy the project would produce. By replacing older model turbines with new, more efficient ones, the Patterson Pass Project would reduce energy production-related contributions to climate change overall, relative to the existing facility, because it would contribute approximately 150% more power to the grid by installing turbines that are 50% more efficient than the existing turbines. The project would contribute approximately 17,000 MWh of additional wind-generated energy per year to the power grid compared to baseline conditions,[5] and would therefore replace the same amount of conventional (carbon-based) energy production. Using an emission factor of 329.9 pounds of CO_2e per MWh developed by PG&E for its current energy production portfolio (Climate Registry 2013b), it can be estimated that the Patterson Pass Project would result in an annual GHG emissions reduction of 3,111 metric tons CO_2e. Therefore, operation of the Patterson Pass Project would result in a net reduction of approximately 3,038 metric tons CO_2e per year and there would be no long-term impacts associated with project-generated GHG emissions.

This impact would be less than significant.

Impact GHG-2a-1: Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases—program Alternative 1: 417 MW (less than significant with mitigation)

The program could conflict with certain GHG reduction goals set forth in AB 32, including the 39 Recommended Actions identified by ARB in its Climate Change Scoping Plan (California Air Resources Board 2008b). Of the 39 measures identified, those that would be considered to be applicable to the program would primarily be those actions related to transportation, the Renewables Portfolio Standard, and high global warming potential gases. Consistency of the program with these measures has been evaluated by each source-type measure below, and standard mitigation measures would be applied to projects within the program identified to reduce impacts as discussed.

[5] Calculation: 19.8 MW * 20% capacity * 8,760 hours per year = 34,690 MWh (baseline); 19.8 MW * 30% capacity * 8,760 hours per year = 52,034 MWh (Repowering Program). Difference = 17,345 MWh.

Scoping Plan Measure T-7: Heavy-Duty Vehicle GHG Emission Reduction (Aerodynamic Efficiency)—Discrete Early Action. This measure will require existing trucks/trailers to be retrofitted with the best available technology and/or ARB-approved technology. This measure has been identified as a Discrete Early Action, which means that it began to be enforceable starting in 2010. Technologies that reduce GHG emissions and improve the fuel efficiency of trucks may include devices that reduce aerodynamic drag and rolling resistance. The requirements would apply to California and out-of-state registered trucks that travel to California. This measure would require in-use trucks and trailers to comply through a phase-in schedule starting in 2010 and achieve 100% compliance by 2014. Construction of the program and the associated use of heavy-duty vehicles for hauling would occur from 2014–2018; therefore, it is possible that the program could conflict with compliance with this recommended action. Pursuant to Mitigation Measure GHG-2a (see below), the applicant would be required to retrofit existing trucks/trailers with the best available technology and/or ARB-approved technology consistent with Scoping Plan Measure T-7. Implementation of Mitigation Measure GHG-2a would ensure that the program would not conflict with implementation of Measure T-7.

Scoping Plan Measure E-3: Renewables Portfolio Standard (RPS). The RPS promotes multiple objectives, including diversifying the electricity supply. Increasing the RPS to 33% is designed to accelerate the transformation of the electricity sector, including investment in the transmission infrastructure and system changes to allow integration of large quantities of intermittent wind and solar generation. The program would add renewable wind-generated energy to the electricity supply and actually result in net GHG emission reductions (see Tables 3.7-3, 3.7-4, and 3.7-5). Therefore, the program would be consistent with this recommended action.

Scoping Plan Measure H-6: High Global Warming Potential Gas Reductions from Stationary Sources – SF_6 Leak Reduction and Recycling in Electrical Applications. This measure will reduce emissions of SF_6 within the electric utility sector and at particle accelerators by requiring the use of best achievable control technology for the detection and repair of leaks and the recycling of SF_6. This measure would establish a regulation mandating a performance standard. Utilities and other affected entities would comply by using leak detection and repair (LDAR) abatement equipment to reduce system leakage. The proposed performance standard would mandate and enhance current voluntary federal SF_6 recycling standards. The program would include installation of a new circuit breaker that would contain SF_6. Pursuant to Mitigation Measure GHG-2b (see below), the applicant would be required to install a circuit breaker with low SF_6 leak rates and monitor SF_6-containing circuit breakers consistent with Scoping Plan Measure H-6. Implementation of Mitigation Measure GHG-2b would ensure that the program would not conflict with implementation of Measure H-6.

The program could also conflict with certain GHG reduction goals set forth in the Alameda County Final Draft Climate Action Plan. Of the GHG reduction measures identified in the CCAP, those that would be considered to be applicable to the program would primarily be those actions related to building construction and solid waste generation. Consistency of the program with these measures has been evaluated by each source-type measure below.

CCAP Measure E-10: Require new construction to use building materials containing recycled content. This measure would encourage new developments to incorporate materials with recycled content, for which the sum of post-consumer recycled content plus one-half of the post-industrial content constitutes at least 10% of the total value of the materials in the project. No new substations are expected to be constructed as part of the program; however, existing substations will be reconstructed or expanded. Pursuant to Mitigation Measure GHG-2c (see below), the applicant

would be required to use building materials containing 10% recycled content consistent with CCAP Measure E-10. Implementation of Mitigation Measure GHG-2c would ensure that the program would not conflict with implementation of CCAP Measure E-10.

CCAP Measure WS-2: Strengthen the Construction and Demolition Debris Management Ordinance. Alameda County's current Green Building Ordinance requires 75% of inert construction and demolition waste (e.g., concrete, asphalt, and stone) and 50% of all remaining designated project-related construction and demolition waste (e.g., wood, vegetative materials, and metals) to be recycled or reused. This measure will amend the ordinance to be consistent with the current Construction and Demolition model ordinance being support by CALGreen and StopWaste.org. The new waste diversion standards will include the following: 1) 100% of inert waste and 50% wood/vegetative/scrap metal not including Alternative Daily Cover (ADC) and unsalvageable material put to other beneficial uses at landfills; and 2) recycling and beneficial reuse of 100% of inert materials (concrete and asphalt). Pursuant to Mitigation Measure GHG-2d (see below), the applicant would be required to comply with the new waste diversion standards for construction and demolition debris consistent with CCAP Measure WS-2. Implementation of Mitigation Measure GHG-2d would ensure that the program would not conflict with implementation of CCAP Measure WS-2.

This impact would be significant, but implementation of Mitigation Measures GHG-2a through GHG-2d would reduce this impact to a less-than-significant level.

Mitigation Measure GHG-2a: Implement best available control technology for heavy-duty vehicles

The applicant will require existing trucks/trailers to be retrofitted with the best available technology and/or ARB-approved technology consistent with the ARB Truck and Bus Regulation (California Air Resources Board 2011). The ARB Truck and Bus Regulation applies to all diesel-fueled trucks and buses with a gross vehicle weight rating (GVWR) greater than 14,000 pounds.

Starting January 1, 2015, the applicant must replace lighter trucks (GVWR of 14,001 to 26,000 pounds) with engines that are 20 years or older with newer trucks. The Applicant has the option to install a PM filter retrofit on a lighter truck by 2014 to make the truck exempt from replacement until January 1, 2020, and any lighter truck equipped with a PM filter retrofit prior to July 2011 would receive credit toward the compliance requirements for a heavier truck or bus in the same fleet.

Starting January 1, 2012, the applicant is required to meet the engine model year schedule shown below for heavier trucks (GVWR greater than 26,000 pounds). To comply with the schedule, the applicant will install the best available PM filter on 1996 model year and newer engines and would replace the vehicle 8 years later. The Applicant will replace trucks with 1995 model year and older engines starting in 2015. Replacements with 2010 model year or newer engines meets the final requirements, but the applicant could also replace trucks with used trucks that would have a future compliance date on the schedule. For example, a replacement with a 2007 model year engine complies until 2023. By 2023 all trucks and buses must have 2010 model year engines with few exceptions.

Engine Model Year Schedule for Heavier Trucks	
Engine Year	**Requirement from January 1**
Pre-1994	No requirements until 2015, then 2010 engine
1994–1995	No requirements until 2016, then 2010 engine
1996–1999	PM filter from 2012 to 2020, then 2010 engine
2000–2004	PM filter from 2013 to 2021, then 2010 engine
2005–2006	PM filter from 2014 to 2022, then 2010 engine
2007–2009	No requirements until 2023, then 2010 engine
2010	Meets final requirements

In addition, the applicant could comply with a phase-in option that would allow the applicant to decide which vehicles to retrofit or replace, regardless of engine model year. The applicant must report information about all heavier trucks starting January 31, 2012, to use this option.

The Applicant could comply by demonstrating that trucks have met the percentage requirement each year as shown in the table below. For example, by 2012 the applicant's fleet would need to have PM filters on 30% of the heavier trucks in the fleet. This option counts 2007 model year and newer engines originally equipped with PM filters toward compliance and would reduce the overall number of retrofit PM filters needed. Any engine with a PM filter regardless of model year would be compliant until at least 2020. Beginning January 1, 2020, all heavier trucks would need to meet the requirements specified in the Compliance Schedule for Heavier Trucks.

Phase-In Option for Heavier Trucks	
Compliance Date	**Vehicles with PM Filters**
1-Jan-12	30%
1-Jan-13	60%
1-Jan-14	90%
1-Jan-15	90%
1-Jan-16	100%

Mitigation Measure GHG-2b: Install low SF_6 leak rate circuit breakers and monitoring

The applicant will ensure that any new circuit breaker installed at a substation has a guaranteed SF_6 leak rate of 0.5% by volume or less. The applicant will provide Alameda County with documentation of compliance, such as specification sheets, prior to installation of the circuit breaker. In addition, the applicant will monitor the SF_6-containing circuit breakers at the substation consistent with Scoping Plan Measure H-6 for the detection and repair of leaks.

Mitigation Measure GHG-2c: Require new construction to use building materials containing recycled content

The applicant will require the construction of all new substation and other permanent buildings to incorporate materials for which the sum of post-consumer recycled content plus one-half of the post-industrial content constitutes at least 10% of the total value of the materials in the project.

Mitigation Measure GHG-2d: Comply with construction and demolition debris management ordinance

The applicant will comply with the County's revised Green Building Ordinance regarding construction and demolition debris as follows: (1) 100% of inert waste and 50% wood/vegetative/scrap metal not including Alternative Daily Cover (ADC) and unsalvageable material will be put to other beneficial uses at landfills, and (2) 100% of inert materials (concrete and asphalt) will be recycled or put to beneficial reuse.

Impact GHG-2a-2: Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases—program Alternative 2: 450 MW (less than significant with mitigation)

Program Alternative 2 could conflict with certain GHG reduction goals set forth in AB 32, including the 39 Recommended Actions identified by ARB in its Climate Change Scoping Plan (California Air Resources Board 2008b). These potential conflicts are the same as presented above for program Alternative 1 for Scoping Plan measures T-7, E-3, and H-6. Consistency of program Alternative 2 with these measures is reflected in the evaluation of program Alternative 1 by each source-type measure above. Implementation of Mitigation Measure GHG-2a (see above) would ensure that program Alternative 2 would not conflict with implementation of Measure T-7. Implementation of Mitigation Measure GHG-2b (see above) would ensure that program Alternative 2 would not conflict with implementation of Measure H-6.

Program Alternative 2 could also conflict with certain GHG reduction goals set forth in the Alameda County Final Draft Climate Action Plan. These potential conflicts are the same as presented above for the program Alternative 1. Consistency of program Alternative 2 with these measures is reflected in the evaluation of program Alternative 1 by each source-type measure above. Implementation of Mitigation Measure GHG-2c (see above) would ensure that program Alternative 2 would not conflict with implementation of CCAP Measure E-10 (see above). Implementation of Mitigation Measure GHG-2d would ensure that program Alternative 2 would not conflict with implementation of CCAP Measure WS-2.

This impact would be significant, but implementation of Mitigation Measures GHG-2a through GHG-2d would reduce this impact to a less-than-significant level.

Mitigation Measure GHG-2a: Implement best available control technology for heavy-duty vehicles

Mitigation Measure GHG-2b: Install low SF_6 leak rate circuit breakers and monitoring

Mitigation Measure GHG-2c: Require new construction to use building materials containing recycled content

Mitigation Measure GHG-2d: Comply with construction and demolition debris management ordinance

Impact GHG-2b: Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases—Golden Hills Project (less than significant with mitigation)

The Golden Hills Project could conflict with certain GHG reduction goals set forth in AB 32, including the 39 Recommended Actions identified by ARB in its Climate Change Scoping Plan (California Air Resources Board 2008b). These potential conflicts are the same as presented above for the program for Scoping Plan measures T-7, E-3, and H-6. Consistency of the Golden Hills Project with these measures is reflected in the evaluation of the program by each source-type measure above. Implementation of Mitigation Measure GHG-2a (see above) would ensure that the Golden Hills Project would not conflict with implementation of Measure T-7. Implementation of Mitigation Measure GHG-2b (see above) would ensure that the Golden Hills Project would not conflict with implementation of Measure H-6.

The Golden Hills Project could also conflict with certain GHG reduction goals set forth in the Alameda County Final Draft Climate Action Plan. These potential conflicts are the same as presented above for the program. Consistency of the Golden Hills Project with these measures is reflected in the evaluation of the program by each source-type measure above. Implementation of Mitigation Measure GHG-2c (see above) would ensure that the Golden Hills Project would not conflict with implementation of CCAP Measure E-10 (see above). Implementation of Mitigation Measure GHG-2d would ensure that the Golden Hills Project would not conflict with implementation of CCAP Measure WS-2.

This impact would be significant, but implementation of Mitigation Measures GHG-2a through GHG-2d would reduce this impact to a less-than-significant level.

Mitigation Measure GHG-2a: Implement best available control technology for heavy-duty vehicles

Mitigation Measure GHG-2b: Install low SF_6 leak rate circuit breakers and monitoring

Mitigation Measure GHG-2c: Require new construction to use building materials containing recycled content

Mitigation Measure GHG-2d: Comply with construction and demolition debris management ordinance

Impact GHG-2c: Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases—Patterson Pass Project (less than significant with mitigation)

The Patterson Pass Project could conflict with certain GHG reduction goals set forth in AB 32, including the 39 Recommended Actions identified by ARB in its Climate Change Scoping Plan (California Air Resources Board 2008b). These potential conflicts are the same as presented above for the program for Scoping Plan measures T-7, E-3, and H-6. Consistency of the Patterson Pass Project with these measures is reflected in the evaluation of the program by each source-type measure above. Implementation of Mitigation Measure GHG-2a (see above) would ensure that the Patterson Pass Project would not conflict with implementation of Measure T-7. Implementation of Mitigation Measure GHG-2b (see above) would ensure that the Patterson Pass Project would not conflict with implementation of Measure H-6.

The Patterson Pass Project could also conflict with certain GHG reduction goals set forth in the Alameda County Final Draft Climate Action Plan. These potential conflicts are the same as presented above for the program. Consistency of the Patterson Pass Project with these measures is reflected in the evaluation of the program by each source-type measure above. Implementation of Mitigation Measure GHG-2c (see above) would ensure that the Patterson Pass Project would not conflict with implementation of CCAP Measure E-10 (see above). Implementation of Mitigation Measure GHG-2d would ensure that the Patterson Pass Project would not conflict with implementation of CCAP Measure WS-2.

This impact would be significant, but implementation of Mitigation Measures GHG-2a through GHG-2d would reduce this impact to a less-than-significant level.

Mitigation Measure GHG-2a: Implement best available control technology for heavy-duty vehicles

Mitigation Measure GHG-2b: Install low SF_6 leak rate circuit breakers and monitoring

Mitigation Measure GHG-2c: Require new construction to use building materials containing recycled content

Mitigation Measure GHG-2d: Comply with construction and demolition debris management ordinance

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