

4.5 Greenhouse Gas Emissions

Section 4.5 provides an analysis of the Proposed Project's impacts as related to greenhouse gas (GHG) emissions. EIR Section 4.5.1 (Existing Conditions) provides a summary of the issues associated with GHG emissions and global climate change, as well as a description of current inventories of GHGs at State, County and Project scales. EIR Section 4.5.2 (San Luis Obispo County Plans and Policies) outlines the County's adopted plans, policies, objectives and related documents related to GHG emissions and their control. EIR Section 4.5.3 (Regulatory Setting) provides a description of applicable federal, State and local regulations regarding GHG emissions, and EIR Section 4.5.4 (Environmental Impact Methodology) describes the technical approach to the GHG analysis, including the identification of impact significance criteria. EIR Section 4.5.5 provides the GHG impact analysis for the Proposed Project. Please refer to EIR Section 4.4 (Air Quality) for the analysis of the Proposed Project's air quality impact analysis.

Scoping Issues Addressed

During the Proposed Project's scoping period one comment letter was received that addressed GHG emissions. This letter was received by the County's APCD, as summarized in Table ES-1 and Appendix A. These comments suggested what the breadth and scope of this analysis should entail, sources of information for the analysis, and use of the APCD's CEQA Air Quality Handbook.

4.5.1 Existing Conditions

Background on Global Climate Change

Globally, temperature, precipitation, sea level, ocean currents, wind patterns and storm activity are all affected by the presence of GHGs in the atmosphere. Human activity contributes to emissions of six primary GHGs: carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride (SF₆). Human-caused emissions of GHGs are linked to climate change. How global climate change may affect California's public health, infrastructure and natural resources is described in the latest Biennial Report of the California Climate Action Team (Cal EPA, 2010). The Climate Action Team found that:

Extreme events from heat waves, floods, droughts, wildfires and bad air quality are likely to become more frequent in the future and pose serious challenges to Californians. They pose growing demands on individuals, businesses and governments at the local, state, and federal levels to minimize vulnerabilities, prepare ahead of time, respond effectively, and recover and rebuild with a changing climate and environment in mind.

For central California, Climate Action Team studies illustrate the potential long-term changes: the number of days conducive to ozone formation in the San Joaquin Valley may rise by 75 to 85 percent by the end of the century; and sea-level rise may place additional pressure on the levee systems and increase the intensity of saltwater intrusion into coastal groundwater resources, leading to increased flooding and decreased freshwater availability (Cal EPA, 2006; 2010).

Statewide and County Emission Inventory

Emissions of CO₂ occur largely from combustion of fossil fuels. Other GHG emissions tracked by State inventories occur in much smaller quantities. However, the global warming potential of CH₄ is about 21 times that of CO₂. When quantifying GHG emissions, the different global warming potentials of GHG pollutants are usually taken into account by normalizing their rates to an equivalent CO₂ emission rate (CO₂e).

California formalized its GHG reduction goals in 2008, when the State produced approximately 483 million metric tonnes of CO₂ equivalent (483 MMTCO₂e), equal to about 533 million tons, or about one percent of the 49,000 MMTCO₂e emitted globally (IPCC, 2014).¹ Statewide GHG emissions in 1990 were 427 MMTCO₂e (CARB, 2007). While emissions grew between 1990 and 2006, the Statewide GHG emission rates declined to 448 MMTCO₂e in 2011 (CARB, 2013), as shown in Table 4.5-1.

Table 4.5-1. California Greenhouse Gas Emissions Inventory (2011)

| Source Category in Scoping Plan | 2011 California GHG Emissions (MMTCO ₂ e/yr) | Percent of Total |
|--|---|------------------|
| Transportation | 168.42 | 37.6 |
| Electric power (generation and imported) | 86.57 | 19.3 |
| Commercial and residential | 45.47 | 10.1 |
| Industrial | 93.24 | 20.8 |
| Recycling and waste | 7.00 | 1.6 |
| High global warming potential gas (including SF ₆ losses) | 15.17 | 3.4 |
| Agriculture | 32.24 | 7.2 |
| Total Emissions | 448.11 | 100 |

Source: CARB, 2013.

The County prepared a “Community-Wide and County Government Operations Baseline Greenhouse Gas Emissions Inventory” during preparation of, and for inclusion in, its Conservation and Open Space Element. The latest account of the inventory was released in 2011 for a baseline year of 2006, the most recent year of comprehensive and reliable data. The 2006 baseline emissions inventory for the unincorporated portions of the County totaled 917,710 metric tonnes (0.918 MMTCO₂e), with 40 percent resulting from transportation and 24 percent attributed to commercial and industrial activities (County of San Luis Obispo, 2011), as shown in Table 4.5-2.

Table 4.5-2. Unincorporated County Greenhouse Gas Emissions Inventory (2006)

| Source Category | 2006 GHG Emissions (MTCO ₂ e/yr) | Percent of Total |
|----------------------------|---|------------------|
| Transportation | 365,260 | 40 |
| Residential | 136,360 | 15 |
| Commercial/Industrial | 215,970 | 24 |
| Waste | 30,540 | 3 |
| Other – Crops | 22,630 | 2 |
| Other – Livestock | 83,420 | 9 |
| Other – Off-Road Equipment | 63,280 | 7 |
| Other – Aircraft | 240 | < 0.1 |
| Total Emissions | 917,710 | 100 |

Source: SLO, 2011.

¹ One metric tonne (MT) equals either 1.1 short tons, 2,204.6 pounds or 1,000 kilograms.

Existing Quarry Operations

The existing quarry is 160.1 acres in size and operates under vested mining entitlements arising from operations prior to 1976 and the 1981 Reclamation Plan and CUP, described in EIR Section 2.4 (Project History and Description of Existing Entitlements). The Statewide (Table 4.5-1) and local (Table 4.5-2) GHG emission inventories include these existing operations as part of the Proposed Project’s environmental “baseline,” or existing conditions.

The Applicant provided a GHG emissions inventory of existing operations that includes materials processing and export, and the corresponding energy use, for average annual production, shown in EIR Section 2.1 (Ambient Consulting, 2012). The total GHG from the existing inventory is less than 3,500 MTCO₂e per year, as summarized in Table 4.5-3.

Table 4.5-3. Existing Quarry Operations Greenhouse Gas Emissions Inventory

| Sources | Typical GHG Emissions (MTCO ₂ e/yr) | Percent of Total |
|-------------------------------------|--|------------------|
| Material processing | 425 | 12 |
| Electricity use | 189 | 5 |
| Propane use | 116 | 3 |
| Off-road equipment used on-site | 1,314 | 38 |
| Material hauling trips | 1,281 | 37 |
| Miscellaneous on-road vehicle trips | 93 | 3 |
| Employee commute trips | 38 | 1 |
| Total Emissions | 3,456 | 100 |

Source: Ambient Consulting, 2012.

Stationary Sources. Equipment at the existing quarry includes the aggregate processing facilities within the quarry’s Upper Area, and the quarry’s Lower Area includes two HMA plants and a portable facility for asphalt and concrete recycling. Material processing at the existing quarry relies on a power generator that uses diesel fuel (41,600 gallons per year) resulting in routine GHG emissions, and propane (20,000 gallons per year), which results in direct emissions of combustion related GHG. The HMA plants and recycling plant are not included in the Applicant’s inventory because they are not considered to be part of the Proposed Project, which is specific to the proposed quarry expansion area and implementation of the Proposed RPA. For more information on existing permits and entitlements for the HMA plants, see Appendix B.

Electricity Use. Electricity used at the existing quarry (644,720 kilowatt hours [kWh] per year) also causes GHG emissions due to operation of conventional fossil-fueled resources to generate the electricity supplied through the grid by Pacific Gas and Electric Company (PG&E).

Water Use. Although the Applicant did not separately quantify the existing GHG emissions attributable to water use, a portion of the energy used at the mine is for pumping and conveying existing water sources for both dust control (55 acre feet per year [afy]) and material processing (306 afy).

Mobile Sources including Haul Trucks. Mobile sources of GHG emissions related to existing operations include diesel-fueled equipment operating within the existing quarry, haul trucks that remove crushed aggregate and granite in loads to customers, workers commuting to the quarry, and other miscellaneous deliveries and on-road vehicle trips necessary to support material hauling and operation of the quarry.

The existing emissions inventory is based on the average annual production, described in EIR Section 2.1 (Project Summary), and a long-term average of 89 daily round-trip truck trips for material hauling.

Loss of Carbon Sequestration. The quarry removes existing vegetative cover to access aggregate material, and by doing so causes the near-term loss of carbon sequestered by the vegetation. This loss is not quantified for existing quarry operations because it would eventually be recovered over the long-term reclamation of the mine. Eventually, new vegetative cover must be restored under the Proposed RPA, which would offset the near-term carbon loss to the atmosphere from land clearing.

4.5.2 San Luis Obispo County Plans and Policies

San Luis Obispo County Climate Action Plan (CAP). The County's adopted CAP, the EnergyWise Plan, serves as a blueprint for reducing GHG emissions related to the County's operations and facilities and within the unincorporated portions of the County (County of San Luis Obispo, 2011). Additionally, in August 2012, the County adopted a Green Building Ordinance to improve energy efficiency in new and existing development. The CAP focuses on local actions to reduce GHG emissions through conservation and efficiency, for example by: retrofitting existing buildings for energy-efficient improvements; water conservation; reducing sprawl; and increasing production of energy from non-fossil fuels such as solar and wind resources.

The primary objective of the CAP is to provide the County's strategy in facilitating a 15 percent reduction in baseline (2006) GHG emissions by 2020, and continuing reductions beyond 2020. Strategies for the longer-term reductions include the County's participation in the regional effort led by the San Luis Obispo Council of Governments to implement land use and transportation measures to reduce regional GHG emissions from the transportation sector by 2035 (per Senate Bill 375, 2008). To achieve these targets, the CAP incorporates various measures and strategies related to energy conservation, renewable energy, solid waste, land use and transportation, water conservation, and agriculture.

The following CAP Policy is relevant to the Proposed Project and its associated Proposed RPA:

Policy 39, Sequestration. *Identify opportunities for terrestrial and aquatic sequestration in the county, including but not limited to County lands, reclaimed mining lands, agricultural lands, and other areas as appropriate. (County Responsible Agency: Planning and Building Department.)*

Actions for this policy [include]:

- *Support preparation of a countywide sequestration assessment of agricultural and open space lands, forests, and aquatic resources.*
- *Support research and implementation through the development of a working group to convene agriculturalists, researchers, and other experts to explore local opportunities and best practices to capture and store carbon.*
- *Explore opportunities for carbon sequestration to be integrated with existing open space acquisition for conservation programs.*
- *Explore opportunities for carbon sequestration to be integrated with natural resource or conservation-based mitigation banking and offset programs.*

APCD CEQA Air Quality Handbook, April 2012. The County APCD maintains guidance for lead agencies implementing CEQA, with rationale and supporting evidence for treatment of GHG in environmental review documents. The most recent update to the CEQA Air Quality Handbook (APCD, 2012a) is used here with supporting evidence on setting GHG thresholds (APCD, 2012b) as a basis for establishing the analytical approach and significance criteria for the Proposed Project.

4.5.3 Regulatory Setting

USEPA Mandatory Reporting (40 Code of Federal Regulations Part 98). This rule requires mandatory reporting of GHG emissions for industrial facilities that emit more than 25,000 MTCO₂e equivalent emissions per year. Currently, there are no promulgated federal regulations limiting GHG emissions from the Proposed Project or requiring reporting to the USEPA.

California Global Warming Solutions Act of 2006 (Assembly Bill 32). This law requires CARB to adopt a Statewide greenhouse gas emissions limit equivalent to the Statewide GHG emissions levels in 1990 (427 MMTCO₂e) to be achieved by 2020. A longer range GHG reduction goal was set in June 2005 by California Executive Order S-3-05, which requires an 80 percent reduction of greenhouse gases from 1990 levels by 2050. CARB adopted the 2020 Statewide target and mandatory reporting requirements in December 2007, and the Statewide Assembly Bill (AB) 32 Scoping Plan, discussed in detail below, in December 2008 (CARB, 2008). Cap-and-trade rules established under the AB32 Scoping Plan apply to a wide range of large industrial and fossil-fuel burning sources across all sectors of the California economy.

California Renewable Energy Resources Act of 2011 (Senate Bill X1-2). In April 2011, Senate Bill (SB) 2 of the 1st Extraordinary Session (SB X1-2) was signed into law. SB X1-2 expressly applies the new 33 percent RPS by December 31, 2020 to all retail sellers of electricity and establishes renewable energy standards for interim years of: an average of 20 percent from 2011 through 2013; a minimum of 20 percent thereafter through 2016; and, a minimum of 25 percent by December 31, 2016. This codified the requirement to achieve 33 percent RPS statewide by the end of 2020, as specified in the AB32 Scoping Plan (CARB, 2008).

Mandatory Reporting of Greenhouse Gas Emissions (17 California Code of Regulations Section 95100). Mandatory reporting of GHG emissions applies to entities within certain regulated source categories, including electricity generation, petroleum refining, cement production, glass production, and iron and steel production, and operators of stationary fuel combustion equipment in any category if calendar year combustion or process emissions exceed 10,000 MTCO₂e per calendar year. The current regulation (effective January 1, 2013) does not apply to the Proposed Project because aggregate mining facilities are not within one of the subject source categories (17 California Code of Regulations Section 95101(a)), and the quarry does not operate, or propose to operate, combustion equipment emitting over 10,000 MTCO₂e per year (Ambient Consulting, 2012).

Cap-and-Trade Program (17 California Code of Regulations Sections 95800 to 96022). The cap-and-trade program applies to covered entities that fall within certain source categories, including electricity generation and petroleum refining, or have emissions exceeding certain thresholds, generally 25,000 MTCO₂e in any year. Mining facilities such as the existing quarry are subject to this rule only if annual combustion-related emissions from the facility exceed 25,000 MTCO₂e, as evidenced through the Mandatory Reporting Rule requirements, as described above. Because the existing quarry does not emit, and does not propose to emit, over 10,000 MTCO₂e per year (Ambient Consulting, 2012), the cap-and-trade program does not apply to the facility.

4.5.4 Environmental Impact Methodology

Significance Criteria

The following significance criteria were derived from the State CEQA Guidelines (Appendix G, Environmental Checklist Form, Section VII), the County APCD CEQA Air Quality Handbook (APCD, 2012a), and supporting evidence from APCD on setting GHG thresholds (APCD, 2012b). The Proposed Project would have a significant impact related to GHG emissions if it would:

- 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.

Approach to Impact Analysis

Global climate change is a cumulative impact that would be affected by GHG emissions. The potential for cumulative impacts is discussed here for consideration by County decision makers (see also EIR Section 5, Cumulative Effects). The State CEQA Guidelines, Section 15064.4(b), require the County, as Lead Agency, to assess the extent to which the Proposed Project may increase or reduce GHG emissions as compared to the existing environmental setting and the extent to which the Project complies with regulations or requirements adopted to implement a Statewide, regional, or local plan for the reduction or mitigation of GHG emissions. This impact analysis follows the approach recommended by the County APCD.

For determining whether the quantity of direct and indirect GHG emissions generated by the Project would be considered potentially significant, this analysis compares Proposed Project emissions with the APCD's GHG threshold of 10,000 MTCO_{2e} per year for long-term operational-related activities of stationary-source type projects (APCD, 2012a; APCD, 2012b). This threshold applies because neither the existing quarry nor the Proposed Project involve a new residential or commercial land use development. The APCD recommends totaling short-term emissions, as in those associated with construction or reclamation phases, and averaging them over the life of the Proposed Project to be compared to the operational threshold.

The effects of the Proposed Project are also considered based on whether it would implement reduction strategies identified under AB32 programs, the County CAP (the EnergyWise Plan), or other strategies to help reduce GHG emissions. If so, it could reasonably follow that the Proposed Project would avoid conflicting with applicable plans, policies, or regulations adopted for the purpose of reducing GHG emissions and would not result in a significant contribution to the cumulative impact of global climate change.

Impacts are categorized per the significance classification system provided in EIR Section 4.1 (Environmental Analysis, Introduction, Impact Significance Classification Scheme).

4.5.5 Project Impacts and Mitigation Measures

Impact GHG-1: Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment

The Proposed Project would extend the mining of crushed aggregate and granite by 59 years, with reclamation being completed by the end of 2076 (see EIR Section 2.5, Proposed Project), and this would continue and extend the emissions of GHG that annually occur due to existing quarry operations. The GHG emissions would continue to be influenced by variations in stationary source operation, fuel use, electricity use, and water use that occur with the existing quarry operations. The trends that would affect the future potential emissions are described in more detail below.

Stationary Sources. The annual inventory of GHG emissions from stationary sources would not change as a result of the Proposed Project. Sources used for material processing at the existing quarry would not change in their operation or quantity. The existing HMA plants are not considered to be part of the Proposed Project, which is specific to the proposed quarry expansion area and implementation of the Proposed RPA. Additionally, no changes to the HMA plants existing operation are proposed, and their existing operation is considered to be part of “baseline” conditions. The material processing system would continue to use diesel fuel and propane resulting in direct emissions of combustion related GHG at the site.

Electricity Use. The amount of electricity used at the existing quarry would not change under the Proposed Project, except for the addition of a conveyor system that would avoid the need for off-road trucks to transport mined material from the excavation pit to the processing area. Electricity use causes GHG emissions from the conventional fossil-fueled resources that generate the electricity supplied through the grid by PG&E. Through implementation of RPS programs by PG&E, the GHG emissions would gradually decrease per unit of electricity supplied.

Water Use. The existing GHG emissions attributable to energy used at the quarry for pumping water and conveying it for dust control and wash water for material processing would increase by less than ten percent as a result of the additional dust suppression water (2.8 afy) that would be needed under the Proposed Project.

Mobile Sources including Haul Trucks. The level of activity of mobile sources would not change under the Proposed Project, except that the addition of a conveyor system would minimize the number of trucks needed for product transportation and the distance of associated access roads. The Applicant anticipates that adding the conveyor system would avoid about 570 MTCO_{2e} per year when compared to the existing emissions from off-road equipment used on-site (Ambient Consulting, 2012). Additionally, all mobile source GHG emissions would be likely to eventually decrease per unit of mobile source activity, if existing equipment at the end of its useful life is replaced with comparable, newer, and more efficient equipment.

Loss of Carbon Sequestration. The Proposed Project would result in an increased amount of land clearing with the additional removal of approximately 27.3 acres of scrub land and approximately 11 acres of woodland, totaling approximately 762 trees (Ambient Consulting, 2012). This land clearing would cause a greater near-term loss of carbon sequestered by vegetation than continuing existing quarry operations. The loss of carbon sequestration would eventually be recovered over the long-term reclamation of the mine, as new vegetative cover would grow under the Proposed RPA. If the Proposed RPA succeeds with a tree-replacement ratio of 1:1, and an average tree life of 20 years, 952 MTCO_{2e} could be sequestered over the first 20 years following quarry closure (Ambient Consulting, 2012), or

about 48 MTCO₂e per year of growth. Higher tree replacement ratios of 2:1 or 4:1 would recover greater levels of carbon from the atmosphere. Because of uncertainty in achieving this long-term level of success for the proposed PRA, which may not be completed until after 2076, this analysis assumes no net loss of GHG to the atmosphere or recovery from the atmosphere due to the sequestration.

The Applicant provided a GHG emissions inventory of Proposed Project operations for a comparison to those occurring with existing quarry operations (Table 4.5-3), and the Applicant’s Project inventory is summarized in Table 4.5-4. Total GHG emissions relative to conditions existing without the Proposed Project would be 2,879 MTCO₂e per year.

Table 4.5-4. Proposed Project Quarry Operations Greenhouse Gas Emissions Inventory

| Sources | Typical GHG Emissions (MTCO ₂ e/yr) | Percent of Total |
|-------------------------------------|--|------------------|
| Material processing | 425 | 15 |
| Electricity use | 189 | 7 |
| Propane use | 116 | 4 |
| Off-road equipment used on-site | 737 | 26 |
| Material hauling trips | 1,281 | 44 |
| Miscellaneous on-road vehicle trips | 93 | 3 |
| Employee commute trips | 38 | 1 |
| Total Emissions | 2,879 | 100 |

Source: Ambient Consulting, 2012.

Excavation

The Proposed Project would result in a continuation of baseline GHG emissions with lower emissions from off-road equipment used at the site until quarry activities cease in 2071. The GHG emissions from materials processing and export and the corresponding energy use would be extended for 59 years before diminishing into the final reclamation phase.

Based on the existing and Proposed Project GHG inventories, as shown in Table 4.5-3 and Table 4.5-4, respectively, the levels of GHG emissions would be less than 3,500 MTCO₂e per year in either case and, therefore, would not exceed the APCD’s GHG threshold of significance for new stationary sources of 10,000 MTCO₂e per year. By continuing the GHG emissions at these levels, the Proposed Project would not generate GHG emissions at a significant level. The impact on the environment from these emissions would be less than significant (Class III).

Reclamation

The Proposed Project would cause reclamation activities to occur later, in potentially completing final reclamation by the end of 2076. This would delay the sequestration of carbon recovered as new vegetative cover grows under the Proposed RPA. Although the Proposed Project would delay the start of reclamation, carbon would eventually be recovered during the long-term reclamation of the mine, much as it would under the existing conditions. The Proposed Project would not change the effect that restoring vegetative cover under the Proposed RPA would effectively offset the near-term carbon loss to the atmosphere that occurs with land clearing. No Impacts would occur (No Impact).

Impact GHG-2: Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases

The Proposed Project would extend the mining of crushed aggregate and granite by 59 years (see EIR Section 2.5, Proposed Project), and this would continue the GHG emissions caused by materials processing and export and corresponding energy use. The existing quarry operates under vested mining entitlements arising from operations prior to 1976 and the 1981 Reclamation Plan CUP, which ensures that the planning inventories for Statewide (see Table 4.5-1) and local (see Table 4.5-2) GHG management include the site's existing operations.

The County's CAP includes Policy 39, Sequestration, which would be applicable to the final phase of the Proposed RPA after completion of all quarry operations. The existing quarry is 160.1 acres in size, and the Proposed Project would add 33 acres to the quarry's boundaries. The Proposed RPA would reestablish vegetation on the mined lands to create natural habitat (see EIR Section 2.6, Reclamation Plan Amendment, for a description of the Proposed RPA's goals). Adaptation of the land to open space uses, including seasonal water storage, oak woodland habitat, riparian woodland habitat, and chaparral vegetation would provide the opportunity for natural processes to sequester atmospheric carbon, and this would be consistent with the County policy to support sequestration over the proposed reclamation area of 193.1 acres.

The Proposed Project would not conflict with regulations adopted under Statewide GHG programs. Although the Proposed Project would continue GHG emissions from quarry operations at the site until 2071, existing quarry operations, as well as the operations under the Proposed Project, would need to comply with applicable GHG reporting or cap-and-trade rules (see EIR Section 4.5.3, Regulatory Setting), including rules and regulations that may be adopted in the future during the operational life of the quarry.

Therefore, the Proposed Project would not conflict with the successful implementation of AB32, the AB32 Scoping Plan, the County CAP, and related goals. Similarly, the Project would not conflict with any other applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions. Because the Proposed Project would not conflict with any applicable plan, policy or regulation for GHG reduction or managing global climate change, no impact would occur (No Impact).

