

## Section 3.7

### Greenhouse Gas Emissions

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This section addresses potential impacts to global climate change resulting from greenhouse gas (GHG) emissions that may result from construction and/or operation of the proposed project. The following discussion addresses the existing conditions of the affected environment pertaining to GHG emissions, evaluates the proposed project's consistency with applicable goals and policies, identifies and analyzes environmental impacts, and recommends measures to reduce or avoid adverse impacts anticipated from implementation of the proposed project, as applicable.

The analysis in this section is based on the *Air Quality Technical Report* prepared by HDR and peer reviewed by Michael Baker International (2019; see **Appendix D-1**).

#### **ENVIRONMENTAL SETTING**

The project site is in the Mojave Desert Air Basin (MDAB), which comprises a 21,000 square-mile area encompassing the majority of San Bernardino County, the eastern portion of Kern County, the eastern portion of Riverside County, and the northeastern portion of Los Angeles County. The MDAB is composed of four California air districts: the Mojave Desert Air Quality Management District (MDAQMD), the Antelope Valley Air Quality Management District, the Eastern Kern Air Pollution Control District, and the eastern portion of the South Coast Air Quality Management District. The climate in the air basin is characterized by hot, dry summers, mild winters, infrequent rainfall, moderate- to high-wind episodes, and low humidity. The majority of the MDAB is relatively rural and sparsely populated.

#### **CLIMATE CHANGE OVERVIEW**

Climate change is a distinct change in average meteorological conditions with respect to temperature, precipitation, and storms. Climate change can result from both natural processes and human activities. Natural changes in the climate result from very small variations in the earth's orbit which change the amount of solar energy the planet receives. Human activities can affect the climate by emitting heat-absorbing gases into the atmosphere and by making changes to the planet's surface, such as deforestation and agriculture. The following impacts to California from climate change have been identified:

- Higher temperatures, particularly in the summer and in inland areas;
- More frequent and more severe extreme heat events;

- Reduced precipitation, and a greater proportion of precipitation falling as rain rather than snow;
- Increased frequency of drought conditions;
- Rising sea levels;
- Ocean water becoming more acidic, harming shellfish and other ocean species; and
- Changes in wind patterns.

These direct effects of climate change may in turn have a number of other impacts, including increases in the number and intensity of wildfires, coastal erosion, reduced water supplies, threats to agriculture, and the spread of insect-borne diseases.

### ***Greenhouse Gas***

GHGs are naturally present in the earth's atmosphere and play a critical role in maintaining the planet's temperature. The natural process through which heat is retained in the troposphere is called the greenhouse effect. The greenhouse effect traps heat in the troposphere through a threefold process as follows: shortwave radiation emitted by the sun is absorbed by the earth; the earth emits a portion of this energy in the form of long-wave radiation; and GHGs in the upper atmosphere absorb this long-wave radiation and re-emit it in all directions, with some radiation heading out into space and some heading back toward the earth. This "trapping" of the long-wave (thermal) radiation emitted back toward the earth is the underlying process of the greenhouse effect. Without the presence of GHGs, the earth's average temperature would be approximately zero degrees Fahrenheit.

Parts of the earth's atmosphere act as an insulating blanket, trapping sufficient solar energy to keep the global average temperature within a range suitable for human habitation. The blanket is a collection of atmospheric gases called greenhouse gases because they trap heat similar to the effect of glass walls in a greenhouse. These gases, mainly water vapor, carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), ozone, and chlorofluorocarbons (CFCs), all act as effective global insulators, reflecting infrared radiation back to the earth. Human activities, such as producing electricity and driving internal combustion vehicles, emit these gases into the atmosphere.

GHG are unlike criteria air pollutants and toxic air contaminants, which are pollutants of regional and local concern. Whereas pollutants with localized air quality effects have relatively short atmospheric lifetimes (about one day), GHGs have much longer atmospheric lifetimes of one year to several thousand years that allow them to be dispersed around the globe. Although the exact

lifetime of any particular GHG molecule is dependent on multiple variables and cannot be pinpointed, it is understood by scientists who study atmospheric chemistry that more CO<sub>2</sub> is emitted into the atmosphere than is sequestered by ocean uptake, vegetation, and other forms of sequestration.

## **REGULATORY FRAMEWORK**

### **FEDERAL**

#### ***The Clean Air Act***

On December 7, 2009, the U.S. EPA issued an endangerment finding that current and projected concentrations of the six GHGs in the atmosphere (CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, SF<sub>6</sub>, HFCs, and PFCs) threaten the public health and welfare of current and future generations. This finding came in response to the Supreme Court ruling in *Massachusetts v. EPA*, which found that GHGs are pollutants under the Federal Clean Air Act. As a result, the U.S. EPA issued its GHG Tailoring Rule in 2010, which applies to facilities that have the potential to emit more than 100,000 MTCO<sub>2</sub>e. In 2014, the U.S. Supreme Court issued its decision in *Utility Air Regulatory Group v. EPA* (No. 12-1146), finding that the U.S. EPA may not treat GHGs as an air pollutant for purposes of determining whether a source is a major source required to obtain a permit pursuant to the “Clean Air Act’s Prevention of Significant Deterioration” or “Title V” operating permit programs. The U.S. EPA’s Greenhouse Gas Reporting Program requires facilities that emit 25,000 MTCO<sub>2</sub>e or more of GHG to report their GHG emissions to the U.S. EPA to inform future policy decisionmakers.

#### ***The Current Administration***

President Trump and the U.S. EPA have stated their intent to halt various federal regulatory activities to reduce GHG emissions. California and other states have stated their intent to challenge federal actions that would delay or eliminate GHG reduction measures and have committed to cooperating with other countries to implement global climate change initiatives. The timing and consequences of these types of federal decisions and potential responses from California and other states are speculative at this time.

### **STATE**

#### ***Assembly Bill 32 (California Global Warming Solutions Act of 2006)***

The California Global Warming Solutions Act of 2006 (Assembly Bill [AB] 32; California Health and Safety Code Division 25.5, Sections 38500 to 38599) establishes regulatory, reporting, and market mechanisms to achieve quantifiable reductions in GHG emissions and establishes a cap on

statewide GHG emissions. AB 32 required that statewide GHG emissions be reduced to 1990 levels by 2020. In 2016, statewide GHG emissions fell below the levels recorded in 1990, four years ahead of schedule.

### ***Executive Order S-1-07***

Executive Order (EO) S-1-07 proclaims that the transportation sector is the main source of GHG emissions in California, generating more than 40 percent of statewide emissions. The EO establishes a goal to reduce the carbon intensity of transportation fuels sold in California by at least 10 percent by 2020. This order also directs the California Air Resources Board (CARB) to determine whether the Low Carbon Fuel Standard (LCFS) could be adopted as a discrete early-action measure as part of the effort to meet the mandates in AB 32.

### ***Executive Order S-3-05***

Executive Order S-3-05 set forth a series of target dates by which statewide emissions of GHGs would be progressively reduced, as follows:

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

The Executive Order directed the secretary of the California Environmental Protection Agency (Cal/EPA) to coordinate a multi-agency effort to reduce GHG emissions to the target levels. The secretary will also submit biannual reports to the governor and the California Legislature describing the progress made toward the emissions targets, the impacts of global climate change on California's resources, and mitigation and adaptation plans to combat these impacts.

### ***Executive Order S-14-08***

Executive Order S-14-08 expands the State's Renewable Energy Standard to 33 percent renewable power by 2020. Additionally, Executive Order S-21-09 (2009) directs CARB to adopt regulations requiring that 33 percent of electricity sold in the state come from renewable energy by 2020.

### ***Executive Order B-30-15, Senate Bill 32, and Assembly Bill 197 (Statewide Interim GHG Targets)***

California EO B-30-15 (April 29, 2015) set an "interim" statewide emission target to reduce greenhouse emissions to 40 percent below 1990 levels by 2030, and directed state agencies with

jurisdiction over greenhouse gas emissions to implement measures pursuant to statutory authority to achieve this 2030 target and the 2050 target of 80 percent below 1990 levels. Specifically, the Executive Order directed CARB to update the Scoping Plan to express this 2030 target in metric tons. Assembly Bill 197 (AB 197) (September 8, 2016) and Senate Bill 32 (SB 32) (September 8, 2016) codified into statute the GHG emissions reduction targets of at least 40 percent below 1990 levels by 2030 as detailed in EO B-30-15. AB 197 also requires additional GHG emissions reporting that is broken down to sub-county levels and requires CARB to consider the social costs of emissions impacting disadvantaged communities.

### ***Senate Bill 350 (Clean Energy & Pollution Reduction Act)***

SB 350 was signed into law in September 2015 and establishes tiered increases to the Renewable Portfolio Standard (RPS). The bill requires 40 percent of the state's energy supply come from renewable sources by 2024, 45 percent by 2027, and 50 percent by 2030. SB 350 also established a new goal to double the energy-efficiency savings in electricity and natural gas through energy efficiency and conservation measures.

## **LOCAL**

### ***San Bernardino County General Plan***

The County's General Plan Conservation Element includes the following goals and policies related to reducing greenhouse gas emissions:

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| <i>Policy CO 4.5</i>  | Reduce emissions through reduced energy consumption.   |
| <i>Policy CO 4.12</i> | Provide incentives to promote siting or use of clean air technologies (e.g., fuel cell technologies, renewable energy sources, UV coatings, and hydrogen fuel).  |
| <i>Policy CO 4.13</i> | Reduce Greenhouse Gas (GHG) emissions within the County boundaries.  |
| <b>GOAL CO 8</b>      | The County will minimize energy consumption and promote safe energy extraction, uses and systems to benefit local regional and global environmental goals.   |
| <i>Policy CO 8.1</i>  | Maximize the beneficial effects and minimize the adverse effects associated with the siting of major energy facilities. The County will site energy facilities equitably in order to minimize net energy use and consumption of natural resources and avoid inappropriately burdening certain communities. Energy planning should conserve energy and reduce |

peak load demands, reduce natural resource consumption, minimize environmental impacts, and treat local communities fairly in providing energy efficiency programs and locating energy facilities.

*Policy CO 8.2* Conserve energy and minimize peak load demands through the efficient production, distribution and use of energy.

### ***San Bernardino County Greenhouse Gas Emissions Reduction Plan***

The County's Greenhouse Gas Emissions Reduction Plan presents a comprehensive set of actions to reduce the county's internal and external GHG emissions to 15 percent below 2011 levels by 2020, consistent with the AB 32 Scoping Plan. The plan has a review standard of 3,000 metric tons (MT) of carbon dioxide equivalent (CO<sub>2</sub>e) per year to identify projects that require screening tables or a project-specific technical analysis to quantify and mitigate GHG emissions. Projects that do not exceed the 3,000 MTCO<sub>2</sub>e per year threshold are considered consistent with the reduction plan and to have a less than significant individual and cumulative impact for greenhouse gas emissions.

## **IMPACT ANALYSIS AND MITIGATION MEASURES**

### **THRESHOLDS FOR DETERMINATION OF SIGNIFICANCE**

A project would result in a significant impact if it would:

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

For the purposes of determining whether GHG emissions from affected projects are adverse, the Mojave Desert Air Quality Management District specifies that project emissions must include direct and indirect emissions during construction and operation. The construction and operational emissions were calculated using the models and emissions factors described in **Appendix D-1**. The MDAQMD has set the daily significance threshold for greenhouse gases at 548,000 pounds per day of CO<sub>2</sub>e.

## PROJECT IMPACTS AND MITIGATION

### **GENERATE SIGNIFICANT GHG EMISSIONS OR CONFLICT WITH A GHG PLAN, POLICY, OR REGULATION**

**Impact 3.7-1**      **The project would not generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment (or conflict with applicable greenhouse gas emissions thresholds) or otherwise conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases. Impacts would be less than significant.**

### CONSTRUCTION IMPACTS

The proposed project is expected to be constructed in three phases, ranging in size from approximately 200 megawatts (MW) to 250 MW. Within each development phase, the construction activities are separated into three different stages: site clearing and preparation, solar panel installation, and electrification. The activities that will occur and the equipment that will be used during each stage are described in Tables A-1 through A-3 in of the *Air Quality Technical Report* in **Appendix D-1**. While there may be overlap during construction of two of the three phases (i.e., the restoration stage of one phase and the mobilization stage of the next), major construction is expected to occur separately. Project facilities such as the substations, gen-tie, and operations and maintenance (O&M) building would be shared among the individual Conditional Use Permits (CUPs) and phases. Final construction phasing would be determined during financing and prior to construction of that particular phase.

The construction emissions for each stage of the proposed project were calculated using the equipment list, the construction schedule contained in **Appendix D-1**, and U.S. EPA emission rates. The total exhaust emissions generated during each of the construction stages are listed in **Table 3.7-1** and detailed in **Appendix D-1**. Because the same equipment and staging would be used for each phase, the peak daily emissions listed in **Table 3.7-1** are applicable to each phase. Only the total duration of construction would vary: 27 months for Phases 1 and 2 constructed at one time, and 19 months for Phase 3. However, there could be overlap between the construction staging within one phase or the concurrent construction of Phases 1 and 2. The peak daily emissions shown in **Table 3.7-1** were calculated using the assumption that stages 1, 2, and 3 would occur simultaneously.

**Table 3.7-1:  
Construction Emissions by Stage (Pounds per Day)**

Construction Stage	CO <sub>2</sub> e
Stage 1	15,844
Stage 2	22,323
Stage 3	4,690
Peak Daily Emissions	42,857
MDAQMD Threshold	548,000
Exceeds Threshold?	<b>No</b>

Source: HDR 2019

As shown in the table, the peak daily construction emissions would not exceed the MDAQMD's threshold of 548,000 pounds per day for greenhouse gas emissions. The proposed project's short-term construction activities, therefore, would not generate greenhouse gas emissions, either directly or indirectly, that may have an adverse effect on the environment.

### OPERATIONAL IMPACTS

Because the proposed project would have no major stationary emission sources, operation of the proposed solar farm would result in substantially lower emissions than project construction. The proposed facility does not burn fossil fuel to generate solar electricity and as a result does not produce a significant amount of emissions. **Table 3.7-2** lists the average daily operation emissions associated with the on-site maintenance equipment and employee commutes.

**Table 3.7-2:  
Operational Emissions (Pounds per Day)**

Emissions Source	CO <sub>2</sub> e
On-Road Sources	777.1
Off-Road Sources	88.3
Maintenance Equipment	1,698.0
Total	2,563.4
MDAQMD Threshold	548,000
Exceeds Threshold?	<b>No</b>

Source: HDR 2019

As shown in the table, the total operational emissions would be 2,563 pounds of CO<sub>2</sub>e per day. Approximately 1,725 acres of cultivated fields and other lands currently used for agricultural production would be cleared of vegetation for development of the proposed project; the remainder of the project site is sparsely vegetated desert and developed or otherwise disturbed land.



Of the agricultural areas, most are currently planted with alfalfa, with a smaller amount of land planted with pistachio orchards. After accounting for farming activities, alfalfa crops reduce GHG emissions by 2.24 MT CO<sub>2</sub>e per acre per year (American Farmland Trust 2015). Assuming that all of the cleared cropland would be alfalfa, the proposed project would reduce the sequestered carbon by 3,864 MT CO<sub>2</sub>e per year or 23,338 pounds of CO<sub>2</sub>e per day.

Therefore, the total daily GHG emissions of 25,901 (23,338 + 2,563) pounds per day would not exceed the MDAQMD's thresholds of 548,000 pounds per day. In addition, once operational, the proposed solar farm will offset GHG emissions generated by electricity produced through the burning of fossil fuels. The Coolwater gas plant was retired and this solar project can produce up to the same equivalent amount of electricity but produces no GHGs, so it is a better alternative to a potential repowering of that gas plant. Therefore, impacts would be less than significant.

Lastly, although project emissions are below applicable thresholds and therefore less than significant, the proposed project would also develop a new source of renewable energy that could replace conventional fossil fuel energy and potentially offset any GHG emissions from the proposed project.

**Mitigation Measures:** None required.

**Level of Significance:** Less than significant.

#### ***CUMULATIVE IMPACTS***

**Impact 3.7-2                      The project would not result in cumulative impacts related to greenhouse gases. Impacts would be less than significant.**

Climate change is an inherently cumulative category of impact. No one project will cause climate change; rather, it is the agglomeration of all global emissions that causes harm. To help address its contribution to the cumulative issue, the State of California has elected to reduce GHG emissions at the state level for activities under its control and has promulgated policy for local agencies to do the same.

Renewable energy production potentially offsets GHG emissions generated by fossil-fuel power plants. The proposed project's GHG emissions would fall below MDAQMD thresholds and would not prevent the state from achieving its GHG reduction goals. In addition, if the energy produced by the proposed project were used as a replacement for the energy produced at an existing fossil-fuel power plant, GHG emissions would decrease. Therefore, the proposed project's GHG emissions are not cumulatively considerable.

**Mitigation Measures:** None required.

**Level of Significance:** Less than significant.

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