

# **Air Quality / Greenhouse Gas Assessment**

for the

## **Longboat Solar Project**

San Bernardino County, California

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**Appendix B:** Health Risk Assessment **(PENDING)**

## 1.0 INTRODUCTION

This document presents an air quality and greenhouse gas assessment for the proposed Longboat Solar Project (project), conducted by GC Environmental, Inc. (GCE) for Environmental Intelligence, LLC (EI), on behalf of the project proponent, EDF Renewable Energy, Inc. (EDF RE). EDF RE seeks to develop and install a photovoltaic (PV) solar module installation on the subject property, located in a rural area near the City of Barstow and the community of Lenwood, within the unincorporated County of San Bernardino, California. This assessment is necessary to comply with the California Environmental Quality Act (CEQA).

### 1.1 Summary of CEQA Requirements

CEQA is required by Section 21000 *et seq.* of the California Public Resources Code and Title 14 of the California Code of Regulations, Section 15000 *et seq.* The intent of CEQA is for the State of California and local public agencies to identify the significant environmental impacts of their actions and to avoid or mitigate those impacts to the extent feasible. For this project, the CEQA Lead Agency is San Bernardino County; its “action” addressed by CEQA would be the approval of a conditional use permit (CUP) authorizing construction and operation of this project.

## 2.0 PROJECT DESCRIPTION

### 2.1 Project Summary

The Longboat Solar, LLC Project is a proposed solar energy facility that would generate up to 20 megawatts<sup>1</sup> (MW) of electricity using single axis tracker solar photovoltaic (PV) technology within an approximately 234.47-acre portion of 324.94 acres of previously disturbed agricultural lands. The project is located on unincorporated lands to the immediate northwest of the City of Barstow, and north of the community of Lenwood, in San Bernardino County, California. State Route 58 bounds the site to the east and north. A Site Vicinity Map and a Preliminary Site Plan are shown in Figures 1 and 2, respectively.

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<sup>1</sup> Alternating current.

The project would connect to the electrical grid by way of a line tap on an existing Southern California Edison (SCE) 33kV transmission line located adjacent to the site along Community Boulevard, at which point the power generated from the project changes ownership from the project developer to SCE. SCE will undertake distribution line upgrades, repairs and modifications along the 33kV lines to SCE's Tortilla Substation located in the City of Barstow approximately 4.5 miles east of the project site. SCE upgrade work will consist of eleven pole replacements, re-conductoring of 2900 feet of electrical line and several minor substation upgrades.

Community Boulevard transects the north and south portions of the project site. The north and south sites will be electrically connected by underground conduit beneath Community Boulevard. The project will also receive its data service from the existing Verizon telecom lines that are currently in the public right of way adjacent to the project.

## 2.2 Project Location

The project is located in unincorporated San Bernardino County, approximately 1.6 miles north of the community of Lenwood and immediately northwest of the City of Barstow (see **Figure 1**). The project site is associated with County Assessor's Parcel Numbers (APNs) 0497-071-40, 0497-121-28, 0497-101-05, and 0497-101-14 (**Table 1**). The project site is located within the U.S. Geological Survey (USGS) 7.5-minute Barstow quadrangle (Township 10 North, Range 2 West, Section 33 and Township 9 North, Range 2 West, Sections 4 and 5). The site is mostly flat with the elevation only increasing slightly from 2,167 feet above mean sea level (MSL) in the eastern portion of the site to 2,185 feet above MSL in the western portion. The site is bounded to the north and east by State Highway 58, Community Boulevard bounds much of the northern boundary and the south is bounded by undeveloped land adjacent to the Mojave River.

Vegetation on the site is generally disturbed and consists of fallow agriculture fields with disturbed saltbush scrub, partially stabilized dunes, tamarisk/ornamental windrows, and abandoned agriculture. Adjacent land uses include a project site landowner's rural residence, scattered rural properties and undeveloped land, light industrial use to the north, and active agriculture to the northwest.



**Table 1.** Identifying information for each of the four project site properties.

Assessor's Parcel Number	Gross Acreage	Owner	Address (Barstow, CA 92311)
0497-071-40	40.34	Hill's Ranch, Inc.	25749 Community Blvd
0497-101-05	77.51	Hill's Ranch, Inc.	25749 Community Blvd
0497-101-14	99.77	Soppeland Revocable Trust	25409 Community Blvd
0497-121-28	107.32	Hill's Ranch, Inc.	25749 Community Blvd

## 2.3 Project Construction

Project construction is anticipated to last up to 10 months. Construction would be comparable to other renewable energy projects and is anticipated to be divided into the following sequence:

1. Roads, grading, and fencing
2. Electrical infrastructure
3. PV assembly and installation
4. Substation interconnection
5. Electrical system upgrades
6. PV commissioning,
7. Project finalization.

Various elements of the project would be constructed concurrently on the property.

The project construction sequence is expected to begin with removal of vegetation for installation of the PV module structures and security fencing. Any large vegetation and brush that currently exists on the site will be removed and the surface graded flat where necessary for safe construction practices. Existing low-lying vegetation will remain undisturbed where possible to provide ground cover and minimize dust generation. A stabilized entrance/exit will be provided to clean vehicle wheels prior to exiting the construction area.

Minimal site grading is proposed for the site. Initial grading work will include the use of excavators, graders, dump trucks, and end loaders, in addition to support pickups, water trucks, and cranes. Water from existing on-site groundwater wells will be required during construction to support concrete manufacturing, dust control, module washing, and sanitary use.

Staging areas will be required for material handling, temporary storage, and staging activities. One staging yard, proposed on the south side of Community Boulevard, would have a short term lease associated for parking and construction staging (see **Figure 2, Site Plan**). Upon the completion of construction, this temporary staging yard, approximately 3 acres in size, would not be a part of the project's pro forma boundary; all other construction staging is expected to occur on the project site. Equipment will be placed in the staging and lay-down areas. A temporary modular construction office may be placed onsite during construction. Disturbed areas, temporary roadways, and equipment laydown sites that are not required as part of the ongoing operating of the facility would be restored in accordance with the County's standard design guidelines.

A stormwater pollution prevention plan (SWPPP) incorporating best management practices (BMPs) for erosion control will be prepared and approved prior to the start of construction. During site preparation, the SWPPP will be implemented and preliminary erosion and sediment control features will be installed.

No hazardous wastes will be generated during the construction of the project. The following wastes are anticipated to be generated: common household trash, cardboard, wood pallets, copper wire, scrap metal and wood wire spools. The project applicant will recycle as much of the generated waste as feasible. Although construction is not expected to generate hazardous waste, field equipment used during construction may contain limited amounts of hazardous materials such as diesel fuel, hydraulic oil, grease, solvents, adhesives, paints, and other petroleum-based products contained in construction vehicles. Standard best management practices will be utilized to contain and dispose of these materials in accordance with applicable regulations.

The project would be constructed by several contractors specializing in renewable energy projects. Some construction employees would be expected to carpool from respective population centers such as Barstow, California, and report to the designated construction staging yards prior to the beginning of each work day. It is anticipated that the employees would utilize Community Boulevard as points of ingress/egress to the property and that, once on site, they would access various sections via the existing and improved network of gravel or compacted dirt roads.

## 2.4 Operation and Maintenance

The project would be operated on an autonomous, unstaffed basis and monitored remotely from an existing off-site facility. It is anticipated that maintenance requirements will be minimal as the proposed project's PV arrays will operate with limited moving parts. No full-time staffing would be required to operate the facility; however one or two employees are expected to visit the site five days per week for routine maintenance and check-ups. Operational activities are limited to monitoring plant performance and responding to utility needs for plant adjustment along with preventative and unscheduled maintenance. The project will operate during daylight hours only. Periodic module cleanings and quarterly maintenance activities might utilize 6 to 8 full-time workers for one to two weeks per quarter, or up to 40 days per year. No heavy equipment will be used during normal project operation. Operation and maintenance vehicles will include trucks (pickup, flatbed), forklifts, and loaders for routine and unscheduled maintenance, and water trucks for solar module washing. Large heavy-haul transport equipment may be brought to the site infrequently for equipment repair or replacement.

Any required maintenance will be scheduled so as to avoid peak electric load periods, with unplanned maintenance activity as needed depending on the event. Preventative maintenance kits and certain critical spare components will be stored at the project site, while all other necessary maintenance components will be available at an offsite location.

Vegetation is sparse with little potential for vegetative fuel buildup. The PV panels and ancillary equipment represent a negligible increase in fire potential. The applicant will, however, have a fire prevention plan for the project in compliance with applicable San Bernardino County regulations. The project would produce a small amount of waste associated with maintenance activities. PV solar farm wastes typically include broken and rusted metal, defective or malfunctioning modules, electrical materials, empty containers, and other miscellaneous solid materials including typical household type refuse generated by workers. These materials will be collected and recycled to the extent possible.

## 2.5 Decommissioning

At the end of the project site's operational term, the applicant may determine that the site should be decommissioned and deconstructed, or it may seek an extension of its CUP. When the arrays are removed after the project's lifetime, the land will be largely unaltered from its natural state. The project would utilize BMPs to ensure the collection and recycling of modules to the extent feasible. All decommissioning activities would adhere to the requirements of the

appropriate governing authorities and in accordance with all applicable federal, State, and County regulations.

## 3.0 CLIMATE

### 3.1 Mojave Desert Air Basin

The project is located in the Mojave Desert Air Basin (MDAB), which is composed of 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 analysis of existing conditions related to air quality summarizes pollutant levels that exist prior to implementation of each component of the project. All components of the project are located within the MDAB; therefore, all air quality data and analysis are presented as an aggregate of the entire project area.

The MDAB is composed of four California air districts: the Mojave Desert Air Quality Management District (discussed below), 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 of the project area (that is, the MDAB) is characterized by hot, dry summers; mild winters; infrequent rainfalls; moderate-to high-wind episodes; and low humidity. The majority of the MDAB is relatively rural and sparsely populated. The MDAB contains many mountain ranges interspersed with long, broad valleys that often contain dry lakes. The Sierra Nevada Mountains provide a natural barrier to the north, preventing cold air masses from Canada and Alaska from moving down into the MDAB. Prevailing winds in the MDAB are out of the west and southwest, caused by air masses pushed onshore in Southern California by differential heating and channeled inland through mountain passes. During the summer months, the MDAB is influenced by the Eastern Pacific High-Pressure Area (a semi-permanent feature of the general hemispheric circulation pattern), which inhibits cloud formation and encourages daytime solar heating. The San Gabriel and San Bernardino mountain ranges block the majority of cool, moist coastal air from the south; as such, the MDAB experiences infrequent rainfalls.

### 3.2 Project Site Climate Summary

Temperature and precipitation data within the project site and the vicinity have been recorded at the Barstow Fire Station for the last 33 years. This location is approximately 5.2 miles east southeast of the project site at latitude 34° 54' North, longitude 117° 01' West. From 1980 to

2013, the annual average temperature recorded at the Barstow Fire Station was 65.4 degrees Fahrenheit, with an average winter (December, January, and February) temperature of approximately 48.2 degrees Fahrenheit and an average summer (June, July, and August) temperature of approximately 83.3 degrees Fahrenheit. The precipitation annual average is approximately 5.1 inches, which occurs mostly during the winter, and relatively infrequently during the summer. Precipitation averages approximately 2.5 inches during the winter (December, January, and February), approximately 0.9 inches during the spring (March, April, and May), approximately 0.6 inch during the summer (June, July, and August), and approximately 1.1 inch during the fall (September, October, and November). Severe weather is uncommon in the MDAB, but strong easterly winds known as the Santa Ana winds can cause 38 to 63 MPH wind gusts below the passes and canyons. During the spring and summer months, air pollution is moved into the region through mountain passes or is lifted by the warm vertical currents produced by the heating of the mountain slopes. From the late summer through the winter months, due to the average lower wind speeds in the project site and its vicinity, air contaminants do not readily disperse and trap air pollution in the area.

## 4.0 AIR QUALITY STANDARDS AND REGIONAL ATTAINMENT STATUS

Responsibility for regulation of air quality in California is held by the California Air Resources Board (CARB), the multi-county Air Quality Management Districts, and single-county Air Pollution Control Districts, with oversight responsibility held by the US Environmental Protection Agency (USEPA). The CARB is responsible for regulation of mobile source emissions, establishment of state ambient air quality standards, research and development, and oversight and coordination of the activities of the regional and local air quality agencies. The regional and local air quality agencies are primarily responsible for regulating stationary source emissions and for monitoring ambient pollutant concentrations. The CARB also classifies air basins, or portions thereof, as “unclassified”, “attainment” or “non-attainment” with respect to the federal and state standards, based on air quality monitoring data. Specific air quality standards are described below.

### 4.1 Federal

#### Clean Air Act

The federal Clean Air Act (CAA), which was initially established by the US Congress in 1970 and substantially revised in 1977 and 1990, is located at Title 42, Chapter 85 of the United States

Code. An important aspect of the CAA is its requirement for the USEPA to establish National Ambient Air Quality Standards (NAAQS). There are NAAQS in place for seven “criteria” pollutants: carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO<sub>2</sub>), ozone (O<sub>3</sub>), particle pollution—further defined as particles having diameters equal to or less than 10 micrometers (PM<sub>10</sub>) and particles having diameters equal to or less than 2.5 micrometers (PM<sub>2.5</sub>)—and sulfur dioxide (SO<sub>2</sub>). Standards are classed as “primary” and “secondary.” Primary standards are designed to protect public health, including sensitive individuals, such as children and the elderly, whereas secondary standards are designed to protect public welfare, such as visibility and crop or material damage.

The CAA requires the USEPA to routinely review and update the NAAQS in accordance with the latest available scientific evidence. For example, the USEPA revoked the annual PM<sub>10</sub> standard in 2006 due to a lack of evidence linking health problems to long-term exposure to PM<sub>10</sub> emissions. The 1-hour standard for O<sub>3</sub> was revoked in 2005 in favor of a new 8-hour standard that is intended to better protect public health.

The NAAQS are shown in **Table 2**, below. For ease of comparison, the California Ambient Air Quality Standards (CAAQS) that have been established by the California Air Resources Board (CARB) are also shown. The CAAQS are discussed in more detail in the discussion of State of California and local regulations in the following subsection.

**Table 2.** Federal and California ambient air quality standards.

Pollutant	Averaging Time	California Standards <sup>a</sup>	National Standards <sup>b</sup>	
		Concentration <sup>c</sup>	Primary <sup>c,d</sup>	Secondary <sup>c,e</sup>
Ozone (O <sub>3</sub> )	1 Hour	0.09 ppm (180 µg/m <sup>3</sup> )	—	Same as Primary Standard
	8 Hour	0.070 ppm (137 µg/m <sup>3</sup> )	0.075 ppm (147 µg/m <sup>3</sup> )	
Respirable Particulate Matter (PM <sub>10</sub> )	24 hour	50 µg/m <sup>3</sup>	150 µg/m <sup>3</sup>	Same as Primary Standard
	Annual Arithmetic Mean	20 µg/m <sup>3</sup>	—	
Fine Particulate Matter (PM <sub>2.5</sub> )	24 Hour	—	35 µg/m <sup>3</sup>	Same as Primary Standard
	Annual Arithmetic Mean	12 µg/m <sup>3</sup>	15 µg/m <sup>3</sup>	
Carbon Monoxide (CO)	1 Hour	20 ppm (23 mg/m <sup>3</sup> )	35 ppm (40 mg/m <sup>3</sup> )	—
	8 Hour	9.0 ppm (10 mg/m <sup>3</sup> )	9 ppm (10 mg/m <sup>3</sup> )	—
	8 Hour (Lake Tahoe)	6 ppm (7 mg/m <sup>3</sup> )	—	—
Nitrogen Dioxide (NO <sub>2</sub> ) <sup>f</sup>	1 Hour	0.18 ppm (339 µg/m <sup>3</sup> )	100 ppb (188 µg/m <sup>3</sup> )	—
	Annual Arithmetic Mean	0.030 ppm (57 µg/m <sup>3</sup> )	0.053 ppm (100 µg/m <sup>3</sup> )	Same as Primary Standard
Sulfur Dioxide (SO <sub>2</sub> ) <sup>g</sup>	1 Hour	0.25 ppm (655 µg/m <sup>3</sup> )	75 ppb (196 µg/m <sup>3</sup> )	-
	3 Hour	—	—	0.5 ppm (1300 µg/m <sup>3</sup> )
	24 Hour	0.04 ppm (105 µg/m <sup>3</sup> )	0.14 ppm (for certain areas) <sup>g</sup>	—
	Annual Arithmetic Mean	—	0.030 ppm (for certain areas) <sup>g</sup>	—
Lead <sup>h, i</sup>	30 Day Average	1.5 µg/m <sup>3</sup>	—	—
	Calendar Quarter	—	1.5 µg/m <sup>3</sup> (for certain areas) <sup>i</sup>	Same as Primary Standard
	Rolling 3-month Average	—	0.15 µg/m <sup>3</sup>	
Visibility Reducing Particles <sup>j</sup>	8 hour	See Footnote j	No National Standard	
Sulfates	24 Hour	25 ug/m <sup>3</sup>		
Hydrogen Sulfide	1 Hour	0.03 ppm (42 ug/m <sup>3</sup> )		
Vinyl Chloride <sup>h</sup>	24 Hour	0.01 ppm (26 ug/m <sup>3</sup> )		

**NOTES:**

**a:** California standards for O<sub>3</sub>, CO (except 8-hour Lake Tahoe), SO<sub>2</sub> (1 and 24 hour), NO<sub>2</sub>, and PM (PM<sub>10</sub>, PM<sub>2.5</sub>, and visibility reducing particles), are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

**b:** National standards (other than O<sub>3</sub>, PM, and those based on annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration measured at

each site in a year, averaged over three years, is equal to or less than the standard. For  $PM_{10}$ , the 24 hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above  $150 \mu\text{g}/\text{m}^3$  is equal to or less than one. For  $PM_{2.5}$ , the 24 hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. Contact the U.S. EPA for further clarification and current national policies.

**c:** Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of  $25^\circ\text{C}$  and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of  $25^\circ\text{C}$  and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

**d:** National Primary Standards: The levels of air quality necessary, with an adequate margin of safety, to protect the public health.

**e:** National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

**f:** To attain the 1-hour national standard, the 3-year average of the annual 98th percentile of the 1-hour daily maximum concentrations at each site must not exceed 100 ppb. Note that the national 1-hour standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the national 1-hour standard to the California standards the units can be converted from ppb to ppm. In this case, the national standard of 100 ppb is identical to 0.100 ppm.

**g:** On June 2, 2010, a new 1-hour  $\text{SO}_2$  standard was established and the existing 24-hour and annual primary standards were revoked. To attain the 1-hour national standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb. The 1971  $\text{SO}_2$  national standards (24-hour and annual) remain in effect until one year after an area is designated for the 2010 standard, except that in areas designated nonattainment for the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved. Note that the 1-hour national standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the 1-hour national standard to the California standard the units can be converted to ppm. In this case, the national standard of 75 ppb is identical to 0.075 ppm.

**h:** The CARB has identified lead and vinyl chloride as 'toxic air contaminants' with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

**i:** The national standard for lead was revised on October 15, 2008 to a rolling 3-month average. The 1978 lead standard ( $1.5 \mu\text{g}/\text{m}^3$  as a quarterly average) remains in effect until one year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978 standard, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.

**j:** In 1989, the CARB converted both the general statewide 10-mile visibility standard and the Lake Tahoe 30-mile visibility standard to instrumental equivalents, which are "extinction of 0.23 per kilometer" and "extinction of 0.07 per kilometer" for the statewide and Lake Tahoe Air Basin standards, respectively.

**SOURCE:** California Air Resources Board. Updated 7 June 2012. Ambient Air Quality Standards. Available at: <http://www.arb.ca.gov/research/aaqs/aaqs2.pdf>



The 1990 amendments to the CAA divide the nation into five categories of planning regions, based on the severity of the regions' pollution, and set new timetables for attaining the NAAQS. The categories range from marginal to extreme. Attainment deadlines are from 3 to 20 years, depending on the category. As shown in **Table 3**, the project site is located in MDAB, a federal non-attainment area for 8-hour O<sub>3</sub> and PM<sub>10</sub> (the federal 1-hour standard was revoked in 2004) and a state non-attainment area for O<sub>3</sub>, PM<sub>10</sub>, and PM<sub>2.5</sub>.

**Table 3.** Ambient Air Quality Standards attainment status of the region.

Ambient Air Quality Standard	Regional Designation/Classification
<i>Federal Standards</i>	
One-hour O <sub>3</sub> <sup>a</sup>	Non-attainment; classified Severe-17
Eight-hour O <sub>3</sub> (1997 84 ppb standard)	Subpart 2 Non-attainment; classified "Moderate"
Eight-hour O <sub>3</sub> (2008 75 ppb-or-lower standard)	Non-attainment; classified "Severe-15"
PM <sub>10</sub>	Non-attainment; classified "Moderate"
PM <sub>2.5</sub>	Unclassified/attainment
CO	Attainment
NO <sub>2</sub>	Unclassified/attainment
SO <sub>2</sub>	Unclassified/attainment
Pb	Attainment
<i>California State Standards</i>	
O <sub>3</sub> <sup>b</sup>	Non-attainment; classified "Moderate"
PM <sub>10</sub>	Non-attainment
PM <sub>2.5</sub>	Non-attainment
CO	Attainment
NO <sub>2</sub>	Attainment
SO <sub>2</sub>	Attainment
Pb	Attainment
Sulfates (State-no federal standard)	Attainment
Hydrogen Sulfide (State-no federal standard)	Unclassified
Visibility-Reducing Particles (State-no federal standard)	Unclassified
Vinyl Chloride	Unclassified

SOURCE: Mojave Desert Air Quality Management District. "California Environmental Quality Act (CEQA) and Federal Conformity Guidelines." August 2011. Available at <<http://www.mdaqmd.ca.gov/index.aspx?page=357>>.

**NOTES:**

a: The 1-hour ozone NAAQS was revoked effective June 15, 2004. This is historical information only.

b: Distinction between the State 1-hour standard and 8-hour standard for O<sub>3</sub> is not given.

Section 182(e)(5) of the CAA allows the USEPA administrator to approve provisions of an attainment strategy in an extreme area that anticipates development of new control techniques or improvement of existing control technologies if the state has submitted enforceable commitments to develop and adopt contingency measures to be implemented if the anticipated technologies do not achieve planned reductions.

Nonattainment areas that are classified as “serious” or “worse” are required to revise their air quality management plans to include specific emission reduction strategies to meet interim milestones in implementing emission controls and improving air quality. The USEPA can withhold certain transportation funds from states that fail to comply with the planning requirements of the CAA. If a state fails to correct these planning deficiencies within two years of federal notification, the USEPA is required to develop a Federal Implementation Plan for the identified nonattainment area or areas.

### **Greenhouse Gas Reporting Rule**

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The USEPA requires reporting of GHG emissions every year by suppliers of fossil fuels or industrial GHGs, manufacturers of vehicles and engines, and facilities that emit more than 25,000 metric tons of carbon dioxide equivalent (CO<sub>2e</sub>) emissions per year. CO<sub>2e</sub> is a quantity that describes, for a given mixture and amount of greenhouse gas, the amount of CO<sub>2</sub> that would have the same GWP, when measured over a specified timescale (generally, 100 years). The project would not trigger GHG reporting according to the rule.

### **Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule**

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On June 29, 2012 the USEPA issued a final rule for GHG permitting thresholds, which are used to determine when Clean Air Act 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. The project would not generate the quantity of GHG emissions to trigger PSD permitting as required by this regulation. Nevertheless, GHG emissions of the project are quantified in Subsection 9.1 of this report.

## **4.2 State**

### **California Clean Air Act**

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The California Clean Air Act of 1988 requires all air pollution control districts in the state to aim to achieve and maintain state ambient air quality standards for O<sub>3</sub>, CO, and NO<sub>2</sub> by the earliest practicable date and to develop plans and regulations specifying how the districts will meet this goal. There are no planning requirements for the state PM<sub>10</sub> standard. The CARB, which became part of the California EPA in 1991, is responsible for meeting state requirements of the federal Clean Air Act, administering the California Clean Air Act, and establishing the California Ambient Air Quality Standards (CAAQS). The California Clean Air Act, amended in 1992, requires all air districts in the state to endeavor to achieve and maintain the CAAQS. The CAAQS are

generally stricter than national standards for the same pollutants, but there is no penalty for nonattainment. California has also established state standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particles, for which there are no national standards.

## **California Greenhouse Gas Legislation**

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“Greenhouse gases” (so called because of their role in trapping heat near the surface of the earth) emitted by human activity are implicated in global climate change, commonly referred to as “global warming.” These greenhouse gases contribute to an increase in the temperature of the earth’s atmosphere by transparency to short wavelength visible sunlight, but near opacity to outgoing terrestrial long wavelength heat radiation in some parts of the infrared spectrum. The principal greenhouse gases (GHGs) are carbon dioxide, methane, nitrous oxide, ozone, and water vapor. For purposes of planning and regulation, Section 15364.5 of the California Code of Regulations defines GHGs to include carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons and sulfur hexafluoride. Fossil fuel consumption in the transportation sector (on-road motor vehicles, off-highway mobile sources, and aircraft) is the single largest source of GHG emissions, accounting for approximately half of GHG emissions globally. Industrial and commercial sources are the second largest contributors of GHG emissions with about one-fourth of total emissions.

California has passed several bills and the Governor has signed at least three executive orders regarding greenhouse gases. GHG statutes and executive orders (EO) include SB 375, SB 1078, SB 1368, AB 32, AB 1493, EO S-03-05, EO S-20-06 and EO S-01-07.

### **Senate Bill 1078**

Senate Bill (SB) 1078 established California’s Renewable Portfolio Standard (RPS) program in 2002. The RPS program requires electrical corporations and electric service providers to purchase a specified minimum percentage of electricity generated by eligible renewable energy resources. The bill requires the California Energy Commission to certify eligible renewable energy resources, to design and implement an accounting system to verify compliance with the RPS by retail sellers, and to allocate and award supplemental energy payments to cover above-market costs of renewable energy. Under SB 1078, each electrical corporation was required to increase its total procurement of eligible renewable energy resources by at least 1 percent per year so that 20 percent of its retail sales were procured from eligible renewable energy resources.

In 2006, SB 107 accelerated the RPS program by establishing a deadline of December 31, 2010, for achieving the goal of having 20 percent of total electricity sold to retail customers in California per year generated from eligible renewable energy resources.

The RPS goal was increased to 33 percent when Governor Schwarzenegger signed Executive Order S-14-08 in November 2008. Executive Order S-14-08 was later superseded by Executive Order S-21-09 on September 15, 2009. Executive Order S-21-09 directed the CARB to adopt regulations requiring 33 percent of electricity sold in the State come from renewable energy by 2020. This Executive Order was superseded by statute SB X1-2 in 2011, which obligates all California electricity providers, including investor-owned utilities and publicly owned utilities, to obtain at least 33 percent of their energy from renewable electrical generation facilities by 2020, with interim targets of 20 percent by 2013 and 25 percent by 2016.

### **Assembly Bill 32: Global Warming Solutions Act of 2006**

Signed by Governor Schwarzenegger in September 2006, Assembly Bill (AB) 32 is one of the most significant pieces of environmental legislation that California has adopted. Among other objectives, it is designed to maintain California's reputation as a "national and international leader on energy conservation and environmental stewardship." It will have wide-ranging effects on California businesses and lifestyles as well as far reaching effects on other states and countries. A unique aspect of AB 32, beyond its broad and wide-ranging mandatory provisions and dramatic GHG reductions are the short time frames within which it must be implemented. Major components of the AB 32 include:

- Require the monitoring and reporting of GHG emissions beginning with sources or categories of sources that contribute the most to statewide emissions.
- Requires immediate "early action" control programs on the most readily controlled GHG sources.
- Mandates that by 2020, California's GHG emissions be reduced to 1990 levels.
- Forces an overall reduction of GHG gases in California by 25-40%, from business as usual, by 2020.
- Must complement efforts to achieve and maintain federal and state ambient air quality standards and to reduce toxic air contaminants.

Statewide, the framework for developing the implementing regulations for AB 32 is under way. Additionally, through the California Climate Action Registry (CCAR now called the Climate Action Reserve), general and industry-specific protocols for assessing and reporting GHG emissions have been developed. GHG sources are categorized into direct sources (i.e. company owned) and indirect sources (i.e. not company owned). Direct sources include combustion

emissions from on-and off-road mobile sources, and fugitive emissions. Indirect sources include off-site electricity generation and non-company owned mobile sources.

### **Senate Bill 97**

In response to the requirements of SB97, the state Resources Agency developed guidelines for the treatment of GHG emissions under CEQA. These new guidelines became state laws as part of Title 14 of the California Code of Regulations in March, 2010. The guidelines recommend that projects be evaluated for the following impacts:

- Would the project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?
- Would the project conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

Individual projects incrementally contribute to the potential for global climate change on a cumulative basis in concert with all other past, present, and probable future projects. While individual projects are unlikely to measurably affect global climate change, each of these projects incrementally contributes to the potential for global climate change on a cumulative basis, in concert with all other past, present, and probable future projects.

Section 15064.4 of the Code specifies how significance of GHG emissions is to be evaluated. The process is broken down into quantification of project-related GHG emissions, making a determination of significance, and specification of any appropriate mitigation if impacts are found to be potentially significant. At each of these steps, the new GHG guidelines afford the lead agency with substantial flexibility.

Emissions identification may be quantitative, qualitative or based on performance standards. CEQA guidelines allow the lead agency to “select the model or methodology it considers most appropriate.” The most common practice for infrastructure/combustion GHG emissions quantification is to use a computer model such as CalEEMod, as was used in the ensuing analysis.

## **4.3 San Bernardino County**

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

The project site is located within unincorporated San Bernardino County; development in such areas is governed by the policies, procedures, and standards set forth in the San Bernardino County General Plan. The portion of the project area south of Community Boulevard is within

the “Rural Living—5 Acre Minimum” Land Use Zoning District. The portion north of Community Boulevard is within the “Agriculture” Land Use Zoning District. Per Section 84.29.020 of the San Bernardino County Code, commercial renewable energy facilities (including solar energy facilities) are permitted in both of these Land Use Zoning Districts in conjunction with a CUP for the project. The project will remain consistent with these land-use provisions.

Development of the San Bernardino County General Plan included a consideration of the effects its land-use element would have on air quality (e.g., via the Environmental Impact Report that was developed and adopted in conjunction with the General Plan). As such, any project that conforms to the provisions of the General Plan is consistent with the air quality goals therein. In particular, the nature of this project does not involve increases in population or traffic that differ to any substantial degree from the assumptions used to develop the General Plan.

Specific air quality policies of the San Bernardino County General Plan that are relevant to this project include:

**Policy CO 4.1:**

*Because developments can add to the wind hazard (due to increased dust, the removal of wind breaks, and other factors), the County will require either as mitigation measures in the appropriate environmental analysis required by the County for the development proposal or as conditions of approval if no environmental document is required, that developments in areas identified as susceptible to wind hazards to address site-specific analysis of:*

- a) Grading restrictions and/or controls on the basis of soil types, topography or season.*
- b) Landscaping methods, plant varieties, and scheduling to maximize successful revegetation.*
- c) Dust-control measures during grading, heavy truck travel, and other dust generating activities.*

The project will follow the MDAQMD rules concerning fugitive dust listed above.

**Policy CO 4.12:**

*Provide incentives to promote siting or use of clean air technologies (e.g., fuel cell technologies, renewable energy sources, UV coatings, and hydrogen fuel).*

The project represents development of a renewable energy source.

## County of San Bernardino Greenhouse Gas Reduction Plan

San Bernardino County has developed a Greenhouse Gas Reduction Plan (GHG Plan) for the unincorporated areas of the county where it has land use authority. The GHG Plan was developed to promote the air quality goals of the County's Master Plan; it is considered a part of that plan. The GHG Plan "presents a comprehensive set of actions to reduce the County's internal and external GHG emissions to 15% below current levels by 2020," which is consistent with the requirements and provisions of AB 32. The policies adopted to implement the GHG Plan are policies of the General Plan.

## San Bernardino County Code

Section 83.01.040 of the San Bernardino County Code (pertaining to construction air quality) will apply to the construction phase of the project. It is presented in pertinent part below.

*(c) Diesel Exhaust Emissions Control Measures. The following emissions control measures shall apply to all discretionary land use projects approved by the County on or after January 15, 2009:*

*(1) On-Road Diesel Vehicles. On-road diesel vehicles are regulated by the State of California Air Resources Board.*

*(2) Off-Road Diesel Vehicle/Equipment Operations. All business establishments and contractors that use off-road diesel vehicle/equipment as part of their normal business operations shall adhere to the following measures during their operations in order to reduce diesel particulate matter emissions from diesel-fueled engines:*

*(A) Off-road vehicles/equipment shall not be left idling on site for periods in excess of five minutes. The idling limit does not apply to:*

*(I) Idling when queuing;*

*(II) Idling to verify that the vehicle is in safe operating condition;*

*(III) Idling for testing, servicing, repairing or diagnostic purposes;*

*(IV) Idling necessary to accomplish work for which the vehicle was designed (such as operating a crane);*

*(V) Idling required to bring the machine system to operating temperature; and*

*(VI) Idling necessary to ensure safe operation of the vehicle.*

*(B) Use reformulated ultra-low-sulfur diesel fuel in equipment and use equipment certified by the U.S. Environmental Protection Agency (EPA) or that pre-dates EPA regulations.*

*(C) Maintain engines in good working order to reduce emissions.*

*(D) Signs shall be posted requiring vehicle drivers to turn off engines when parked.*

*(E) Any requirements or standards subsequently adopted by the South Coast Air Quality Management District, the Mojave Desert Air Quality Management District or the California Air Resources Board.*

*(F) Provide temporary traffic control during all phases of construction.*

*(G) On-site electrical power connections shall be provided for electric construction tools to eliminate the need for diesel-powered electric generators, where feasible.*

*(H) Maintain construction equipment engines in good working order to reduce emissions. The developer shall have each contractor certify that all construction equipment is properly serviced and maintained in good operating condition.*

*(I) Contractors shall use ultra-low sulfur diesel fuel for stationary construction equipment as required by Air Quality Management District (AQMD) Rules 431.1 and 431.2 to reduce the release of undesirable emissions.*

*(J) Substitute electric and gasoline-powered equipment for diesel-powered equipment, where feasible.*

## **4.4 Regional**

### **Mojave Desert Air Quality Management District**

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The Mojave Desert Air Quality Management District (MDAQMD) has jurisdiction over the project site. The MDAQMD is the air pollution control agency for San Bernardino County's High Desert and Riverside County's Palo Verde Valley. It includes nearly 20,000 square miles and a population of more than 500,000; it is the second largest of California's 35 air districts by area. The MDAQMD has primary responsibility for controlling emissions from stationary sources of air pollution within its jurisdiction. This is accomplished in part by administering air quality programs required by state and federal mandates and enforcing rules and regulations based on air pollution law.



The MDAQMD is responsible for monitoring air quality and for planning, implementing, and enforcing programs designed to attain and maintain federal and state ambient air quality standards in the district. In addition, MDAQMD is responsible for establishing stationary-source permitting requirements and for ensuring that new, modified, or related stationary sources do not create net emission increases.

### State Implementation Plans

An important component of the MDAQMD's air quality planning strategy is contained in the State Implementation Plan (SIP) for the State of California. The federal Clean Air Act (CAA) requires all states to submit a SIP to the US Environmental Protection Agency. This statewide SIP is often referred to as an "infrastructure" SIP. Infrastructure SIPs are administrative in nature and describe the authorities, resources, and programs a state has in place to implement, maintain, and enforce the federal standards. It does not contain any proposals for emission control measures.

In addition to infrastructure SIPs, the CAA requires submissions of SIPs for areas that are out of compliance with NAAQS. These area attainment SIPs are comprehensive plans that describe how an out-of-compliance area will attain and maintain the particular NAAQS standard(s) it does not conform to. Once an out-of-compliance area has attained the standard in question, a maintenance SIP is required for a period of time to ensure the area will continue to meet the standard.

SIPs are not single documents. They are a compilation of new and previously submitted plans, programs (such as monitoring, modeling, permitting, etc.), district rules, state regulations, and federal controls. Many of California's SIPs rely on the same core set of control strategies, including emission standards for cars and heavy trucks, fuel regulations and limits on emissions from consumer products. State law makes CARB the lead agency for all purposes related to SIPs. Local air districts and other agencies prepare SIP elements and submit them to CARB for review and approval. CARB forwards SIP revisions to the US Environmental Protection Agency for approval and publication in the Federal Register.

Some of the most recent MDAQMD SIPs are listed below:

- 2008: *Federal 8-hour Ozone Attainment Plan (Western Mojave Desert Non-attainment area)*
- 2004: *[1-hour] Ozone Attainment Plan (State and Federal)*—combined NAAQS and CAAQS plan
- 1995: *Mojave Desert Planning Area Federal Particulate Matter (PM<sub>10</sub>) Attainment Plan*

## State-level Air Quality Plans

Air quality plans are also required for attaining and maintaining California Ambient Air Quality Standards (CAAQS). Analogous to State Implementation Plans for NAAQS, these plans are required for air districts that do not meet CAAQS standards for O<sub>3</sub>, CO, SO<sub>2</sub>, and NO<sub>2</sub>, as well as for those air districts that are defined by CARB as receptors or contributors of air pollution from or to areas outside the district. These state-level plans are submitted to CARB. Often, these requirements are included in a single document that addresses both California and federal air quality plan requirements.

The most recent state-level air quality plan is the [1-hour] *Ozone Attainment Plan (State and Federal)*, a combined NAAQS and CAAQS plan adopted in 2004.

## MDAQMD Rules

The MDAQMD has adopted rules to limit air emissions. Many of these rules were put in place as required measures specified in the various SIPs and air quality plans. This evaluation considered seven MDAQMD rules for regulation of fugitive dust and emissions from fossil fuel combustion. Excerpts of these rules are presented below. The full and official text of these rules is available within the MDAQMD website.<sup>2</sup>

### **Rule 401: Visible Emissions**

*A person shall not discharge into the atmosphere from any single source of emission whatsoever any air contaminant for a period or periods aggregating more than three minutes in any one hour which is:*

- *As dark or darker in shade as that designated No. 1 on the Ringelmann Chart, as published by the United States Bureau of Mines, or*
- *(b) Of such opacity as to obscure an observer's view to a degree equal to or greater than does smoke described in subsection (a) of this rule.*

### **Rule 402: Nuisance**

*A person shall not discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance or annoyance to any considerable*

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<sup>2</sup> <http://www.mdaqmd.ca.gov/index.aspx?page=138>

*number of persons or to the public, or which endanger the comfort, repose, health or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property.*

#### **Rule 403: Fugitive Dust**

- *(a) A person shall not cause or allow the emissions of fugitive dust from any transport, handling, construction or storage activity so that the presence of such dust remains visible in the atmosphere beyond the property line of the emission source. (Does not apply to emissions emanating from unpaved roadways open to public travel or farm roads. This exclusion shall not apply to industrial or commercial facilities).*
- *(b) A person shall take every reasonable precaution to minimize fugitive dust emissions from wrecking, excavation, grading, clearing of land and solid waste disposal operations.*
- *(c) A person shall not cause or allow particulate matter to exceed 100 micrograms per cubic meter when determined as the difference between upwind and downwind samples collected on high volume samplers at the property line for a minimum of five hours.*
- *(d) A person shall take every reasonable precaution to prevent visible particulate matter from being deposited upon public roadways as a direct result of their operations. Reasonable precautions shall include, but are not limited to, the removal of particulate matter from equipment prior to movement on paved streets or the prompt removal of any material from paved streets onto which such material has been deposited.*
- *(e) Subsections (a) and (c) shall not be applicable when the wind speed instantaneously exceeds 40 kilometers (25 miles) per hour, or when the average wind speed is greater than 24 kilometers (15 miles) per hour. The average wind speed determination shall be on a 15 minute average at the nearest official air-monitoring station or by wind instrument located at the site being checked.*
- *(f) The provisions of this rule shall not apply to agricultural operations.*

#### **Rule 403.2: Fugitive Dust Control for the Mojave Desert Planning Area**

(Pertinent parts of the regulation are listed below.)

##### **(C) Requirements**

- *(1) The owner or operator of a source in an affected source category shall comply with the applicable requirements contained in this subsection unless and until the owner or operator has applied for and obtained a District-approved ACP [Alternative PM<sub>10</sub> Control Plan] pursuant to section (G).*
- *(2) The owner or operator of any Construction/Demolition source shall:*

- *(a) Use periodic watering for short-term stabilization of Disturbed Surface Area to minimize visible fugitive dust emissions. For purposes of this Rule, use of a water truck to maintain moist disturbed surfaces and actively spread water during visible dusting episodes shall be considered sufficient to maintain compliance;*
- *(b) Take actions sufficient to prevent project-related Trackout onto paved surfaces;*
- *(c) Cover loaded haul vehicles while operating on Publicly Maintained paved surfaces;*
- *(d) Stabilize graded site surfaces upon completion of grading when subsequent development is delayed or expected to be delayed more than thirty days, except when such a delay is due to precipitation that dampens the disturbed surface sufficiently to eliminate Visible Fugitive Dust emissions;*
- *(e) Clean-up project-related Trackout or spills on Publicly Maintained paved surfaces within twenty-four hours; and*
- *(f) Reduce non-essential Earth-Moving Activity under High Wind conditions. For purposes of this Rule, a reduction in Earth-Moving Activity when visible dusting occurs from moist and dry surfaces due to wind erosion shall be considered sufficient to maintain compliance.*
- *(3) The owner/operator of a Construction/Demolition source disturbing 100 or more acres shall, in addition to the provisions of subsection (2):*
  - *(a) Prepare and submit to the MDAQMD, prior to commencing Earth-Moving Activity, a dust control plan that describes all applicable dust control measures that will be implemented at the project;*
  - *(b) Provide Stabilized access route(s) to the project site as soon as is feasible.*
  - *For purposes of this Rule, as soon as is feasible shall mean prior to the completion of Construction/Demolition activity;*
  - *(c) Maintain natural topography to the extent possible;*
  - *(d) Construct parking lots and paved roads first, where feasible; and*
  - *(e) Construct upwind portions of project first, where feasible.*

...
- *(5) The Owner or Operator of a site undergoing weed abatement activity shall not:*
  - *(a) Disrupt the soil crust to the extent that Visible Fugitive Dust is created due to wind erosion.*

...

(E) *Recordkeeping*

- *The owner or operator of an affected source shall maintain a Dust Control Plan as required by Sections (C)(3) and (C)(7) on site, or readily accessible, for at least two years after the date of each entry. Such records shall be provided to the District upon request.*

Test methods, compliance methods, requirements for alternate PM<sub>10</sub> Control Plans, and other requirements are detailed in the text of the Rule, which is available at the MDAQMD website.<sup>3</sup>

**Rule 404: Particulate Matter Concentration**

- *A person shall not discharge into the atmosphere from any source, particulate matter except liquid sulfur compounds, in excess of the concentration at standard conditions, shown in Table 404(a). Where the volume discharged is between figures listed in the table, the exact concentration permitted to be discharged shall be determined by linear interpolation.*
- *(b) The provisions of this rule shall not apply to emissions resulting from the combustion of liquid or gaseous fuels in steam generators or gas turbines.*
- *(c) For the purposes of this rule, emissions shall be averaged over one complete cycle of operation or one hour, whichever is the lesser time period.*

Refer to the official text of the Rule at the MDAQMD website to see Table 404(a).

**Rule 405: Solid Particulate Matter Weight**

- *(a) A person shall not discharge into the atmosphere from any source, solid particulate matter including lead and lead compounds, in excess of the rate shown in Table 405 (a). Where the process weight per hour is between figures listed in the table, the exact weight of permitted discharge shall be determined by linear interpolation.*
- *(b) For the purposes of this rule, emissions shall be averaged over one complete cycle of operation or one hour, whichever is the lesser time period.*

Refer to the official text of the Rule at the MDAQMD website to see Table 405(a).

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<sup>3</sup> <http://www.mdaqmd.ca.gov/index.aspx?page=138>

## Rule 409: Combustion Contaminants

*A person shall not discharge into the atmosphere from the burning of fuel, combustion contaminants exceeding 0.23 gram per cubic meter (0.1 grain per cubic foot) of gas calculated to 12 percent of carbon dioxide (CO<sub>2</sub>) at standard conditions averaged over a minimum of 25 consecutive minutes.*

## 5.0 EXISTING AIR QUALITY CONDITIONS

### 5.1 Emission Sources

The project site currently contains a few buildings, structures, and other built features on the project parcels, however all project acreage is raw land. Open ditches, earthen basins, and other irrigation infrastructure are the predominant features at the project site. There are three residential/agricultural compounds adjacent to the project site. Two of these are owned by the same parties that own the project site; the third is on a parcel on which a temporary storage/lay down area will be placed for the duration of the project construction. A cheese factory is also adjacent to the project site north of Community Boulevard. California State Route 58 is located immediately adjacent to the project site to the east and north. Air pollutants are emitted daily from nearby agricultural activities, by heavy equipment, space and water heating, and vehicle trips to and from the area (particularly to the cheese factory). However, the main source of air pollutants in the project is carried in by air masses traveling from more polluted areas upwind.

### 5.2 Air Monitoring Stations

The Mojave Desert Air Basin is provided with data from 13 air-quality monitoring stations. The closest station to the project site is at 225 East Mountain View Street, Barstow, California 92311, approximately 4.4 miles to the southeast of the project site. The station measures concentrations of O<sub>3</sub>, NO<sub>x</sub> (i.e. NO and NO<sub>2</sub>), CO, and PM<sub>10</sub>. The next closest station is located at 14306 Park Avenue, Victorville, California 92392, approximately 30 miles to the southwest of the project site. Here, concentrations of O<sub>3</sub>, CO, NO<sub>x</sub>, PM<sub>2.5</sub>, PM<sub>10</sub>, and SO<sub>2</sub>, are measured; however, only the concentrations of the constituents not measured at the Barstow station (PM<sub>2.5</sub> and SO<sub>2</sub>) are used from the Victorville station for this analysis. No other air quality data (e.g. lead and vinyl chloride) are available. Three years of data (2011, 2012, and 2013) are presented in **Table 4**, below. In **Table 4**, the air quality standard referenced for each pollutant is the California state standard, as these standards are more restrictive than the federal

standards. In the few instances where the federal standard is more restrictive than the state standard or when no state standard exists, the federal standard is referenced.

Ambient air quality data for the project site area recorded at the Barstow and Victorville—Park Avenue monitoring stations from 2011 to 2013 indicate exceedances for the applicable state standards for  $O_3$ ,  $PM_{10}$ , and  $NO_2$ . Exceedances do not necessarily constitute nonconformance with the applicable air quality standard; the exceedance of the federal  $NO_2$  standard is not a nonconformance with the standard because, for any given monitoring station, the 98th percentile of 1-hour daily maximum  $NO_2$  concentrations, averaged over 3 years is compared with the 0.100 ppm standard to determine conformance.

**Table 4.** Summary of 2011-2013 ambient air quality data in the project site vicinity.

Pollutant	Measured Pollution Concentration and Standards	Averages and Exceedances		
		2011	2012	2013
Ozone (O <sub>3</sub> ) <sup>a</sup>	Maximum 1-hour concentration (ppm)	0.09	0.09	<b>0.10</b>
	Days above State 1- hour standard (0.09 ppm)	0	0	<b>1</b>
	Maximum 8-hour concentration (ppm)	<b>0.084</b>	<b>0.085</b>	<b>0.093</b>
	Days above State 8-hour standard (0.070 ppm)	<b>35</b>	<b>36</b>	<b>31</b>
Carbon Monoxide (CO) <sup>a</sup>	Maximum 8-hour concentration (ppm)	1.35	0.66	Data Not Available
	Days above 8-hour State standard (20 ppm)	0	0	
Nitrogen dioxide (NO <sub>2</sub> ) <sup>a</sup>	Maximum 1-hour concentration (ppm)	0.077	<b>0.146</b>	0.085
	Days above Federal 1-hour standard (0.100 ppm)	0	<b>7</b>	0
	Annual concentration (ppm)	0.017	0.017	Data Not Available
	Exceed 0.03 ppm (State annual standard)?	No	No	
Suspended Particulate Matter (PM <sub>10</sub> ) <sup>a</sup>	Maximum 24-hour concentration (µg/m <sup>3</sup> )	<b>96.0</b>	<b>39.0</b>	<b>85.6</b>
	Days above State 24-hour standard (50 µg/m <sup>3</sup> )	<b>2</b>	<b>0</b>	<b>1</b>
	3-year maximum annual concentration (µg/m <sup>3</sup> )	<b>25</b>	<b>22</b>	<b>22</b>
	Exceed 20 µg/m <sup>3</sup> (State annual standard)	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
Fine Particulate Matter (PM <sub>2.5</sub> ) <sup>b</sup>	Maximum 24-hour concentration (µg/m <sup>3</sup> )	15.0	12.0	13.1
	Days above Federal 24-hour standard (35 µg/m <sup>3</sup> )	0	0	0
	Annual concentration (µg/m <sup>3</sup> ) <sup>c</sup>	7.6	Data Not Available	Data Not Available
	Exceed 12 µg/m <sup>3</sup> (State annual standard)	No		
Sulfur Dioxide (SO <sub>2</sub> ) <sup>b</sup>	Maximum 24-hour concentration (ppm)	0.007	0.003	0.002
	Exceed 0.04 ppm (State 24-hour standard)	No	No	No

NOTES:

**a:** Data for O<sub>3</sub>, CO, NO<sub>2</sub>, and PM<sub>10</sub> are taken from the Barstow monitoring station.

**b:** Data for PM<sub>2.5</sub> and SO<sub>2</sub> are taken from the Victorville—Park Avenue monitoring station.

**c:** Latest record available is from 2010.

SOURCE:

California Environmental Protection Agency, Air Resources Board. iADAM Air Quality Data Statistics (website). Accessed 16 Dec. 2014 Available at <<http://www.arb.ca.gov/adam/>>.



### 5.3 Greenhouse Gas Emissions

In order to establish a reference point for future GHG emissions, CO<sub>2e</sub> emissions have been projected based on an unregulated, business-as-usual, GHG emissions scenario that does not consider the reductions in GHG emissions required by Executive Order S-3-05 or AB 32. CARB has stated that California contributed 427 million metric tons of GHG emissions in CO<sub>2e</sub> in 1990, and under a business-as-usual development scenario, will contribute approximately 596 million metric tons of CO<sub>2e</sub> emissions in 2020, which presents a linear upward trend in California's total GHG emissions. Business-as-usual GHG emissions for San Bernardino County can be estimated by the GHG inventory developed by the South Coast Air Quality Management District for the county (see **Table 5**, below). It has been projected that the population of San Bernardino County will increase by approximately 1.9 percent from 2007 to 2020. San Bernardino County is estimated to have been responsible for the emission of approximately 28 million metric tons of CO<sub>2e</sub> in 2007 and will be responsible for 36 million metric tons of CO<sub>2e</sub> in 2020 under a business-as-usual emissions scenario).

**Table 5.** Characterization of Business-as-Usual GHG emissions for San Bernardino County.

	Year			
	1990	2002	2007	2020
Population	1,418,380	1,785,347	2,056,450	2,533,956
Annual GHG emissions for SB County (million metric tons of CO <sub>2e</sub> )	25	25	28	36
Emission factor (metric tons of CO <sub>2e</sub> per capita)	18	14	14	14

SOURCE: South Coast Air Quality Management District. *Greenhouse Gas Inventories for the County of San Bernardino*. May 2009 (Rev December 2010).

### 5.4 Sensitive Receptors

Land uses that can be considered sensitive receptors include residences, schools, playgrounds, childcare centers, athletic facilities, long-term health care facilities, rehabilitation centers, convalescent centers, and retirement homes. Sensitive individuals with compromised immune systems, such as children and the elderly, may be exposed to emissions from the construction and operation of the project. The greatest potential for exposure of sensitive receptors to air contaminants would occur during the temporary construction phase, when soil would be

disturbed and equipment would be used for site grading, materials delivery, and PV solar panel installation.

Potential exposure to emissions would vary substantially from day to day, depending on the amount of work being conducted, weather conditions, location of receptors, and exposure time. The construction-phase emissions in this analysis are estimated conservatively based on worst-case conditions, with maximum levels of construction activity occurring simultaneously within a short period of time. The nearest sensitive receptors are scattered rural residential land uses. Residential land uses have the highest potential to be affected by the project, in particular single-family or multiple-family residences located in the surrounding community within 1 mile (5,280 feet) of the project site. Sensitive receptors for the project include residences on two parcels adjacent to the project site: (a) the residence located on APN 497-101-09 which is south of Community Boulevard and is surrounded on three sides by the project<sup>4</sup>, and (b) the residences believed to be located at the Green Valley Foods cheese factory directly north of the project site across Community Boulevard. The residential structures on both properties are approximately 100 feet from the project boundary. Additionally, there is a residential area along Community Boulevard that begins approximately 800 feet east of the project site's most eastern boundary. Highway 58 and the Southern Pacific railroad tracks separate these residences from the project site. Other residential structures within one mile of the project site include a few rural residences to the west and the community of Lenwood to south.

## 6.0 AIR POLLUTION CONSTITUENTS

### 6.1 Pollutants and Their Effects

The analysis contained herein reviews criteria pollutants designated by the federal and California Clean Air Acts. Criteria air pollutants are defined as pollutants that are hazardous to human health and are regulated by federal and state ambient air quality standards or criteria for outdoor concentrations. The federal and state standards have been set at levels above which concentrations would be harmful to human health and are designed to protect the most sensitive persons from illness or discomfort. Criteria pollutants of concern include carbon

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<sup>4</sup> APN 497-101-09. The owners of this property are leasing a portion of the parcel to the project proponent for a temporary storage area and laydown yard that will be removed following construction. It is not part of the project's *pro forma* area.

monoxide (CO), ozone (O<sub>3</sub>), nitrogen dioxide (NO<sub>2</sub>), sulfur dioxide (SO<sub>2</sub>), particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>), and lead (Pb). As defined by the federal Clean Air Act, *hazardous air pollutants* are a variety of pollutants generated or emitted by industrial production activities. Called toxic air contaminants (TACs) under the California Clean Air Act, 10 pollutants have been identified through ambient air quality data as posing the most substantial health risk in California. On April 2, 2007, the Supreme Court in Massachusetts, et al. v. Environmental Protection Agency, et al. (549 U.S. 1438; 127 S. Ct. 1438) ruled that the Clean Air Act gives the U.S. Environmental Protection Agency (USEPA) the authority to regulate emissions of GHGs, including carbon dioxide (CO<sub>2</sub>); methane (CH<sub>4</sub>); nitrous oxide (N<sub>2</sub>O); and fluorinated gases, such as hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride, thereby legitimizing GHGs as air pollutants under the Clean Air Act.

GHGs trap energy from the sun and help maintain the temperature of the Earth's surface, creating a process known as the greenhouse effect. The sun emits solar radiation and provides energy to Earth. Six percent of the solar radiation emitted by the sun is reflected back by the atmosphere surrounding the Earth, 20 percent of the solar radiation is scattered and reflected by clouds, 19 percent of the solar radiation is absorbed by the atmosphere and clouds, 4 percent of the solar radiation is reflected back to the atmosphere by the Earth's surface, and 51 percent of the solar energy is absorbed by the Earth. GHGs such as CO<sub>2</sub> and CH<sub>4</sub> are naturally present in the atmosphere. The presence of these gases prevents outgoing infrared radiation from escaping the Earth's surface and lower atmosphere, allowing incoming solar radiation to be absorbed by living organisms on Earth. Without these GHGs, the earth would be too cold to be habitable; however, an excess of GHGs in the atmosphere can cause global climate change by raising the Earth's temperature, resulting in environmental consequences related to snowpack losses, flood hazards, sea-level rises, and fire hazards.

Global climate change results from a combination of three factors:

- 1) natural factors, such as changes in the sun's intensity or slow changes in the Earth's orbit around the sun;
- 2) natural processes within the Earth's climate system, such as changes in ocean circulation; and
- 3) anthropogenic activities, such as fossil fuel combustion, deforestation, reforestation, urbanization, and desertification, that change the composition of atmospheric gases.

In its 2007 climate change synthesis report to policymakers, the Intergovernmental Panel on Climate Change (IPCC) concluded, "global GHG emissions due to human activities have grown since pre-industrial times, with an increase of 70 percent between 1970 and 2004". Therefore,

significant attention is being given to the anthropogenic causes of the increased GHG emissions level. In the review of regulatory publications from California Air Pollution Control Officers Association (CAPCOA), California Air Resources Board (CARB), the California Attorney General, and the Governor's Office of Planning and Research (OPR), there is a consensus on the close association between fossil fuel combustion, in conjunction with other human activities, and GHG emissions. In California, GHG emissions are largely contributed by the transportation sector, which was responsible for 35 percent and 38 percent of 1990 and 2004 GHG emissions statewide, respectively. After transportation followed the electricity generation sector, which was responsible for 25 percent of statewide emissions in both 1990 and 2004; the industrial sector, which was responsible for 24 percent and 20 percent of statewide 1990 and 2004 GHG emissions; and the commercial sector, which was responsible for 3 percent of statewide emissions in both 1990 and 2004.

A detailed description of the characteristics and effects of criteria pollutants and GHGs are provided in the following sections.

### **Carbon Monoxide**

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CO is a colorless, odorless gas formed by the incomplete combustion of fossil fuels. CO is emitted almost exclusively from motor vehicles, power plants, refineries, industrial boilers, ships, aircrafts, and trains. In urban areas, automobile exhaust accounts for the majority of CO emissions. CO is nonreactive air pollutant that dissipates relatively quickly; therefore, ambient CO concentrations generally follow the spatial and temporal distributions of vehicular traffic. CO concentrations are influenced by local meteorological conditions, including wind speed, topography, and atmospheric stability. CO produced by motor vehicle exhaust can be locally concentrated when surface-based temperature inversions are combined with calm atmospheric conditions, such as situations at dusk in urban areas between November and February. The highest levels of CO typically occur during the colder months of the year when inversion conditions are more frequent. Inversion is an atmospheric condition in which a layer of warm air traps cooler air near the surface of the earth, preventing the normal rising of surface air. CO has a higher binding affinity to hemoglobin than oxygen (O<sub>2</sub>), so it can replace O<sub>2</sub> in the blood and reduce the ability of blood to transport O<sub>2</sub> to vital organs. Low CO concentrations can cause fatigue in healthy persons and chest pain in persons with heart disease. At moderate concentrations, CO can cause angina, impaired vision, and reduced brain function. At high concentrations, CO can cause impaired vision and coordination, headaches, dizziness, confusion, and nausea. At very high concentrations, CO exposure can be fatal.

## Reactive Organic Gases and Volatile Organic Compounds

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Hydrocarbons are organic gases that are formed solely of hydrogen and carbon. There are several subsets of organic gases, including volatile organic compounds (VOCs) and reactive organic gases (ROGs). ROGs include all hydrocarbons except those exempted by CARB. Therefore, ROGs are a set of organic gases based on state rules and regulations. VOCs are similar to ROGs in that they include all organic gases except those exempted by federal law. Both VOCs and ROGs are emitted from incomplete combustion of hydrocarbons or other carbon-based fuels. Combustion engine exhaust, oil refineries, and oil-fueled power plants are the primary sources of hydrocarbons. Another source of hydrocarbons is evaporation from petroleum fuels, solvents, dry cleaning solutions, and paint.

The primary health effects of hydrocarbons result from the formation of O<sub>3</sub> and its related health effects (see ozone health effects discussion below). High levels of hydrocarbons in the atmosphere can interfere with oxygen intake by reducing the amount of available oxygen through displacement. There are no separate federal or California ambient air quality standards for ROG. Carcinogenic forms of ROG are considered TACs. An example is benzene, which is a carcinogen.

## Ozone

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O<sub>3</sub> is a colorless gas that is formed in the atmosphere when ROGs, which include VOCs and nitrogen oxides (NO<sub>x</sub>), react in the atmosphere in the presence of ultraviolet sunlight. The primary sources of VOCs and NO<sub>x</sub> are automobile exhaust emissions and industrial emissions. Ideal conditions for O<sub>3</sub> formation occur during summer and early fall on days with low wind speeds or stagnant air, warm temperatures, and cloudless skies. O<sub>3</sub> is one of the main components of photochemical smog in urban areas. Health effects associated with exposure to O<sub>3</sub> include increased respiratory and cardiovascular disease; increased symptoms of respiratory illness such as cough, phlegm, and wheeze; decreased lung function; increased bronchodilator usage; and increased daily mortalities.

## Nitrogen Dioxide

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NO<sub>2</sub> is a highly reactive, brownish-red gas that plays a major role in the formation of ground-level O<sub>3</sub> and acid rain. NO<sub>2</sub> is produced in the atmosphere from the reaction of atmospheric oxygen (O<sub>2</sub>) with nitric oxide (NO). NO<sub>x</sub> collectively refers to both NO and NO<sub>2</sub>. The main sources of NO<sub>2</sub> include fuel combustion in industry and in motor vehicles. High concentrations of NO<sub>2</sub> can cause breathing difficulties and can result in a brownish-red cast to the atmosphere

with reduced visibility. NO<sub>2</sub> is toxic to various animals and to humans because it can react with water to form nitric acid in the eyes, lungs, mucus membranes, and skin. Epidemiological studies have shown associations between NO<sub>2</sub> concentrations and chronic pulmonary fibrosis and daily mortalities from respiratory and cardiovascular causes. Some increase in bronchitis in children (two and three years old) has also been observed at concentrations below 0.3 parts per million (ppm).

## Sulfur Dioxide

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SO<sub>2</sub> is a colorless, pungent gas formed primarily by the combustion of sulfur-containing fossil fuels. Generally, the highest levels of SO<sub>2</sub> are found near large industrial complexes where coal and oil are used in power plants and industries. In recent years, SO<sub>2</sub> concentrations have been reduced due to the increasingly stringent controls placed on stationary source emissions of SO<sub>2</sub> and limits on the sulfur content of fuels. SO<sub>2</sub> causes its irritant effects by stimulating nerves in the lining of the nose, throat and the airways of the lungs. This causes a reflex cough, irritation, and a feeling of chest tightness, which may lead to narrowing of the airways. Acute respiratory symptoms and diminished ventilator function in children can be caused by SO<sub>2</sub> emissions, which can also damage plants and erode metals.

## Particulate Matter

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Particulate Matter (PM) consists of very small liquid and solid particles suspended in air, which can include smoke, soot, dust, salts, acids, and metals. PM can be formed when gases emitted from industries and motor vehicles undergo chemical reactions in the atmosphere. Fine particulate matter (PM<sub>2.5</sub>) refers to particles that are 2.5 microns or less in diameter, which is roughly 1/28th the diameter of a human hair. PM<sub>10</sub> refers to particles that are 10 microns or less in diameter, which is about 1/7th the thickness of a human hair. Primary sources of PM<sub>2.5</sub> emissions include fuel combustion from motor vehicles, power generation, industrial facilities, residential fireplaces, and wood stoves. In addition, PM<sub>2.5</sub> can be formed in the atmosphere from gases such as SO<sub>2</sub>, NO<sub>x</sub>, and VOCs. Major sources of PM<sub>10</sub> include crushing or grinding operations; dust stirred up by vehicles traveling on roads; wood-burning stoves and fireplaces; dust from construction, landfills, and agriculture; wildfires and brush/waste burning activities; industrial sources; windblown dust from open lands; and atmospheric chemical and photochemical reactions.

PM<sub>2.5</sub> and PM<sub>10</sub> pose a greater health risk than larger-sized particles pose. When inhaled, small particles can penetrate the natural defenses of the human respiratory system and damage the respiratory tract. Elevated particulate levels have been strongly linked to premature deaths,

hospital admissions, emergency room visits, and asthma attacks; particulate matter inhalations can also significantly reduce development of lung function in children. Components of particulate matter can include substances such as Pb, sulfates ( $\text{SO}_4$ ), and nitrates, which can cause lung damage directly and can be absorbed into the blood stream and cause damage elsewhere in the body. Moreover, these substances can transport absorbed gases, such as chlorides or ammonium, into the lungs and cause injury.  $\text{PM}_{10}$  tends to collect in the upper portion of the respiratory system, whereas  $\text{PM}_{2.5}$  can penetrate deeper into the lungs and damage lung tissues. Suspended particulates also damage and discolor surfaces on which they settle and produce haze in the atmosphere that reduces regional visibility.

## Lead

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Pb in the atmosphere occurs as PM. Main sources of Pb emissions include leaded gasoline, battery manufacture, paint, ink, ceramics, ammunition, and secondary Pb smelters. Prior to 1978, mobile emissions were the primary source of atmospheric Pb. After the phase-out of leaded gasoline between 1978 and 1987, secondary Pb smelters, battery recycling, and manufacturing facilities became Pb emission sources of greater concern. Prolonged exposure to atmospheric Pb poses a serious threat to human health, the effects of which include gastrointestinal disturbances, anemia, kidney disease, and, in severe cases, neuromuscular and neurological dysfunction. Infants and young children are particularly sensitive even to very low levels of Pb, and such exposure could result in decrements in neurobehavioral performance, including intelligence quotient performance, psychomotor performance, reaction time, and growth.

## Sulfates

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Sulfates ( $\text{SO}_4^{2-}$ ) are particulate products of combustion of sulfur-containing fossil fuels. When SO or  $\text{SO}_2$  are exposed to oxygen they precipitate out into sulfates ( $\text{SO}_3$  or  $\text{SO}_4$ ).

Sulfates are the fully oxidized ionic form of sulfur. Sulfates occur in combination with metal and/or hydrogen ions. In California, emissions of sulfur compounds occur primarily from the combustion of petroleum-derived fuels (that is, gasoline and diesel fuel) that contain sulfur. This sulfur is oxidized to sulfur dioxide ( $\text{SO}_2$ ) during the combustion process and is subsequently converted to sulfate compounds in the atmosphere. The conversion of  $\text{SO}_2$  to sulfates takes place relatively rapidly and completely in urban areas of California due to regional meteorological features. CARB's sulfates standard is designed to prevent aggravation of respiratory symptoms. Effects of sulfate exposure at levels above the standard include a decrease in ventilatory function, aggravation of asthmatic symptoms, and an increased risk of cardiopulmonary disease. Sulfates are particularly effective in degrading visibility, and, because



they are usually acidic, can harm ecosystems and damage materials and property. The entire Mojave Desert Air Basin is in attainment for the State standard for sulfates.

## Hydrogen Sulfide

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Hydrogen sulfide (H<sub>2</sub>S) is associated with geothermal activity, oil and gas production, refining, sewage treatment plants, and confined animal feeding operations.

Exposure to low concentrations of H<sub>2</sub>S may irritate the eyes, nose, and throat. It may also cause difficulty in breathing for some asthmatics. Exposure to higher concentrations (above 100 ppm) of H<sub>2</sub>S can cause olfactory fatigue, respiratory paralysis, and death. Brief exposures to high concentrations of H<sub>2</sub>S (greater than 500 ppm) can cause a loss of consciousness. In most cases, the person appears to regain consciousness without any other effects. However, in many individuals, there may be permanent or long-term effects such as headaches, poor attention span, poor memory, and poor motor function. No health effects have been found in humans exposed to typical environmental concentrations of H<sub>2</sub>S (0.00011 to 0.00033 ppm). Deaths due to inhaling large amounts of H<sub>2</sub>S have been reported in a variety of different work settings, including sewers, animal processing plants, waste dumps, sludge plants, oil and gas well drilling sites, and tanks and cesspools.

## Visibility-reducing Particles

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Visibility is often characterized by visual range (VR), which is the maximum distance at which a person can barely perceive a dark object. VR is determined by the difference in contrast between the object and the background. A 2 percent contrast is considered barely perceptible, and typically at least at 5 percent change in contrast is needed to be noticeable. The less water vapor, sea salt particulate, and pollutants in the air, the greater the VR. VRs of up to about 150 miles (240 kilometers) can occur in clean desert areas where there is very low relative humidity. In coastal regions, the occurrence of sea salt particulate and water vapor can significantly reduce the maximum VR that could occur. The CARB does not yet have a measurement method that is accurate or precise enough to designate areas in the state as being in attainment or nonattainment for visibility-reducing particles. The entire state is currently unclassified.

## Vinyl Chloride

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Vinyl chloride monomer is a sweet smelling, colorless gas at ambient temperature. Landfills, publicly owned treatment works, and polyvinyl chloride (PVC) production are the major identified sources of vinyl chloride emissions in California. PVC can be fabricated into several products, such as pipes, pipefittings, and plastics. In humans, epidemiological studies of



occupationally exposed workers have linked vinyl chloride exposure to development of liver angiosarcoma, which is a rare cancer, and have suggested a relationship between exposure and cancers of the lung and brain. There are currently no adopted ambient air standards for vinyl chloride.

Acute exposure of humans to high levels of vinyl chloride via inhalation has resulted in effects on the central nervous system, such as dizziness, drowsiness, headaches, and giddiness.

Vinyl chloride is reported to be slightly irritating to the eyes and respiratory tract in humans. Acute exposure to extremely high levels of vinyl chloride has caused loss of consciousness, irritation to the lungs and kidneys, and inhibition of blood clotting in humans and cardiac arrhythmias in animals.

Tests involving acute exposure of mice to vinyl chloride have shown a high acute toxicity from inhalation exposure to the substance. Long-term exposure to vinyl chloride concentrations has been linked with chronic health effects:

- Liver damage may result in humans from chronic exposure to vinyl chloride, through both inhalation and oral exposure
- A small percentage of individuals occupationally exposed to high levels of vinyl chloride in air have developed a set of symptoms termed vinyl chloride disease, which is characterized by Raynaud's phenomenon (fingers blanch and numbness and discomfort are experienced upon exposure to cold), changes in the bones at the end of the fingers, joint and muscle pain, and scleroderma-like skin changes (thickening of the skin, decreased elasticity, and slight edema).
- Central nervous system effects (including dizziness, drowsiness, fatigue, headache, visual and/or hearing disturbances, memory loss, and sleep disturbances), as well as peripheral nervous system symptoms (peripheral neuropathy, tingling, numbness, weakness, and pain in fingers) have also been reported in workers exposed to vinyl chloride.

Several reproductive/developmental health effects from vinyl chloride exposure have been identified:

- Several case reports suggest that male sexual performance may be affected by vinyl chloride. However, these studies are limited by lack of quantitative exposure information and possible co-occurring exposure to other chemicals.

- Several epidemiological studies have reported an association between vinyl chloride exposure in pregnant women and an increased incidence of birth defects, while other studies have not reported similar findings.
- Epidemiological studies have suggested an association between men occupationally exposed to vinyl chloride and miscarriages in their wives' pregnancies, although other studies have not supported these findings.
- Long-term exposure to vinyl chloride has also been identified as a cancer risk:
  - Inhaled vinyl chloride has been shown to increase the risk of a rare form of liver cancer (angiosarcoma of the liver) in humans.
  - Animal studies have shown that vinyl chloride, via inhalation, increases the incidence of angiosarcoma of the liver and cancer of the liver.

## Carbon Dioxide

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CO<sub>2</sub> is a colorless, odorless, and nonflammable gas that is the most abundant GHG in the Earth's atmosphere after water vapor. CO<sub>2</sub> enters the atmosphere through natural processes, such as respiration and forest fires, and through human activities such as the burning of fossil fuels (oils, natural gas, and coal) and solid waste, deforestation, and industrial processes. CO<sub>2</sub> absorbs terrestrial infrared radiation that would otherwise escape to space and, therefore, plays an important role in atmospheric warming. CO<sub>2</sub> has an atmospheric lifetime of up to 200 years and, therefore, is a more important GHG than water vapor, which has an atmospheric residence time of only a few days. CO<sub>2</sub> provides the reference point for the global warming potential (GWP) of other gases; thus, the GWP of CO<sub>2</sub> is equal to 1. Global warming potential (GWP) is a relative measure of how much heat a greenhouse gas traps in the atmosphere.

## Methane

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CH<sub>4</sub> is a principal component of natural gas and consists of a single carbon atom bonded to four hydrogen atoms. It is formed and released to the atmosphere by biological processes from livestock and other agricultural practices and by the decay of organic waste in anaerobic environments such as municipal solid waste landfills. CH<sub>4</sub> is also emitted during the production and transport of coal, natural gas, and oil. CH<sub>4</sub> is about 21 times more powerful at warming the atmosphere than CO<sub>2</sub> (a GWP of 21).

The chemical lifetime of CH<sub>4</sub> in the atmosphere is approximately 12 years. The relatively short atmospheric lifetime of CH<sub>4</sub>, coupled with its potency as a GHG, makes it a candidate for mitigating global warming over the short term. CH<sub>4</sub> can be removed from the atmosphere by a

variety of processes, such as the oxidation reaction with hydroxyl radicals (OH), microbial uptake in soils, and reaction with chlorine (Cl) atoms in the marine boundary layer.

## Nitrous Oxide

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N<sub>2</sub>O is a clear, colorless gas with a slightly sweet odor. N<sub>2</sub>O has a long atmospheric lifetime (approximately 120 years) and heat-trapping effects about 310 times more powerful than CO<sub>2</sub> on a per molecule basis (a GWP of 310). N<sub>2</sub>O is produced by both natural and human-related sources. The primary anthropogenic sources of N<sub>2</sub>O are agricultural soil management like soil cultivation practices, animal manure management, sewage treatment, mobile and stationary combustion of fossil fuels, and production of adipic and nitric acids. The natural process of producing N<sub>2</sub>O ranges from a wide variety of biological sources in soil and water, particularly microbial action in wet tropical forests.

## Fluorinated Gases

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Hydrofluorocarbons (HFCs), perfluorocarbons, and sulfur hexafluoride are synthetic, powerful GHGs that are emitted from a variety of industrial processes, including aluminum production, semiconductor manufacturing, electric power transmission, magnesium production and processing, and the production of HCFC-22. Fluorinated gases are being used as substitutes for ozone-depleting chlorofluorocarbons (CFCs). Fluorinated gases are typically emitted in small quantities; however, they have high GWPs of between 140 and 23,900.

## Toxic Air Contaminants

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As defined by the federal Clean Air Act, hazardous air pollutants include a variety of pollutants generated or emitted by industrial production activities. Called TACs under the California Clean Air Act, 10 pollutants have been identified through ambient air quality data as posing the most substantial health risk in California. Direct exposure to these pollutants has been shown to cause cancer, birth defects, damage to brain and nervous system, and respiratory disorders. CARB provides emission inventories for only the larger air basins.

The San Bernardino County portion of the Mojave Desert Air Basin (MDAB) shows the following tons per year (tpy) emissions for the year 2008 (the latest finalized record available) for the 10 TACs: acetaldehyde (402 tpy); benzene (397 tpy); 1,3- butadiene (111 tpy); carbon tetrachloride (0 tpy); chromium (hexavalent) (0 tpy); para-dichlorobenzene (20 tpy); formaldehyde (799 tpy); methylene chloride (53 tpy); perchloroethylene (68 tpy); and diesel particulate matter (1450 tpy). Approximately 80 percent of statewide acetaldehyde emissions are from mobile sources, with area sources such as residential wood combustion accounting for approximately 18

percent of total emissions. The primary sources of benzene in the state include mobile sources (87 percent) and stationary sources (12 percent). Approximately 46 percent of hexavalent chromium emissions are from stationary sources such as electrical generation, aircraft and parts manufacturing, and fabricated metal produce manufacturing. The majority of 1,3-butadiene emissions are generated from incomplete combustion of gasoline and diesel fuels. Approximately 53 percent of 1,3-butadiene emissions are from mobile sources and approximately 21 percent are from area sources such as agricultural waste burning and open burning. Emissions of carbon tetrachloride are all produced by stationary sources such as chemical and allied produce manufacturers and petroleum refineries. Most of the emissions of para-dichlorobenzene are from consumer products such as non-aerosol insect repellents and solid/gel air fresheners. Approximately 82 percent of formaldehyde emissions in California are from mobile sources, while 48 percent of methylene chloride emissions are from paint removers/strippers, automotive brake cleaners, and other consumer products. Perchloroethylene is produced primarily from stationary sources such as dry cleaning plants and manufacture of aircraft parts and fabricated metal parts. Emissions of diesel particulate matter are from mobile sources (98 percent) and stationary sources (1 percent).

Ambient air quality standards have not been established for TACs because concentrations that may be considered “safe” cannot be determined. TAC impacts are evaluated by calculating the health risks associated with a given exposure. The requirements of the Air Toxic “Hot Spots” Information and Assessment Act (Act) apply to facilities that use, produce, or emit toxic chemicals. Facilities that are subject to the toxic emission inventory requirements of the Act must prepare and submit toxic emission inventory plans and reports and periodically update those reports. There is only one facility within the MDAQMD that emits TACs at levels that exceed a cancer risk of 10 in 1 million or a non-cancer hazard index of 1.0, MDAQMD thresholds at which obligations under the Hot Spots program apply. This facility is in Adelanto, approximately 30 miles to the southwest of the project site. The project is not anticipated to emit TACs to any significant degree.

## 7.0 SIGNIFICANCE CRITERIA

Based on Guidelines for the Implementation of California Environmental Quality Act (CEQA), Appendix G, Public Resource Code (PRC) Sections 15000–15387, a project would normally be considered to have a significant effect on air quality if the project would:

- Conflict with or obstruct implementation of any applicable air quality plan.
- Violate any air quality standard or contribute substantially to an existing or projected air quality violation.
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors).
- Expose sensitive receptors to substantial pollutant concentrations.
- Create objectionable odors affecting a substantial number of people.

Specific thresholds used to determine significance are discussed below.

Based on Guidelines for the Implementation of CEQA Appendix G, Public Resource Code (PRC) Sections 15000–15387, a project would normally be considered to have a significant effect on greenhouse gas emissions if the project 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.

### 7.1 Regional Thresholds for Construction and Operational Emissions

#### MDAQMD Thresholds

In addition to the federal and California ambient air quality standards, MDAQMD has set CEQA emissions thresholds-of-significance for construction and operation of proposed projects in the District, as described in its *CEQA and Federal Conformity Guidelines* (August 2011). Any project with construction and/or operational direct or indirect emissions that exceed the CEQA significance thresholds established by MDAQMD's *CEQA and Federal Conformity Guidelines* is considered significant under CEQA review. The MDAQMD CEQA thresholds generally correspond to the air quality criteria of Appendix G of the CEQA Guidelines, set forth above.

MDAQMD's Criterion Number 1 thresholds are presented below in **Table 6** as annual and equivalent daily rates.

**Table 6.** MDAQMD Criterion Number 1 emission Thresholds-of-Significance for Criteria Pollutants.

Criteria Pollutant	Annual Threshold (Tons)	Daily Threshold (Pounds)
Greenhouse Gases (CO <sub>2e</sub> )*	100,000	548,000
Carbon Monoxide (CO)	100	548
Oxides of Nitrogen (NO <sub>x</sub> )	25	137
Volatile Organic Compounds (VOC)	25	137
Oxides of Sulfur (SO <sub>x</sub> )	25	137
Particulate Matter (PM <sub>10</sub> )	15	82
Particulate Matter (PM <sub>2.5</sub> )	15	82
Hydrogen Sulfide (H <sub>2</sub> S)	10	54
Lead (Pb)	0.6	3

\* For greenhouse gas emissions, the lower (more conservative) thresholds-of-significance promulgated by the San Bernardino County Greenhouse Emissions Reduction Plan (effective January 2012) were used; these thresholds are presented on the next page. The MDAQMD thresholds are shown here for completeness.

Other MDAQMD criteria that may be used to determine that a project is significant with respect to air quality include the following:

- Criterion Number 2: Generates a violation of any ambient air quality standard when added to the local background.
- Criterion Number 3: Does not conform with the applicable attainment or maintenance plan(s) (A project does not exceed this threshold if it is consistent with applicable zoning, specific plan and general plan use designations or involves a zoning or plan amendment that does not increase dwelling unit density, vehicle trips or vehicle miles traveled).
- Criterion Number 4: Exposes sensitive receptors (as defined in the Guidelines) to substantial pollutant concentrations, including those resulting in a cancer risk greater than or equal to 10 in a million and/or a Hazard Index (HI) (non-cancerous) greater than or equal to 1.

The MDAQMD CEQA Guidelines state that, "[i]n general, the emissions comparison [Criterion Number 1)] is sufficient" for purposes of a CEQA impacts analysis. Projects that do not exceed the thresholds-of-significance in Criterion Number 1 are generally considered to have less-than-significant impacts with respect to air quality.

## US Environmental Protection Agency Thresholds

The thresholds presented in **Table 7** are found at 40 CFR 93 153. They are *de minimis* levels—minimum thresholds for which a conformity determination must be performed under the General Conformity Rule—for various criteria pollutants in various nonattainment and maintenance areas. The General Conformity Rule is intended to ensure that actions taken by federal agencies in nonattainment and maintenance areas do not interfere with a state’s plans to meet national standards for air quality (e.g., State Implementation Plans). Because the Longboat Solar Project is not a federal action, the *de minimis* levels in Table 7 do not apply to it. (The MDAQMD Thresholds-of-Significance presented in Table 6 perform the same role as the *de minimis* levels for non-federal projects.) Nevertheless, they are presented here for comparison purposes. Because the MDAQMD Thresholds-of-Significance are equal or more stringent than the *de minimis* levels, the *de minimis* levels will not be discussed further.

**Table 7.** US Environmental Protection Agency *de minimis* levels

Criteria Pollutant	Annual Threshold (Tons)
Carbon Monoxide (CO)	100 (All Nonattainment and Maintenance Areas)
Oxides of Nitrogen (NO <sub>x</sub> )	50 (Serious Nonattainment Areas)
	25 (Severe Nonattainment Areas)
	10 (Extreme Nonattainment Areas)
	100 (All Other Nonattainment and Maintenance Areas)
Volatile Organic Compounds (VOC)	50 (Serious Nonattainment Areas)
	25 (Severe Nonattainment Areas)
	10 (Extreme Nonattainment Areas)
	100 (All Other Nonattainment and Maintenance Areas)
Oxides of Sulfur (SO <sub>x</sub> )	100 (All Nonattainment and Maintenance Areas)
Particulate Matter (PM <sub>10</sub> )	100 (Moderate Nonattainment Areas)
	100 (All Other Nonattainment and Maintenance Areas)
	70 (Serious Nonattainment Areas)
Particulate Matter (PM <sub>2.5</sub> )	100 (All Nonattainment and Maintenance Areas)
Lead (Pb)	25

## Greenhouse Gas Emissions

The threshold used to evaluate GHG emissions from the project was the project’s compliance with the County’s *Greenhouse Gas Emissions Reduction Plan*, adopted on 6 December 2011 and effective 6 January 2012 (GHG Plan). The GHG Plan establishes a GHG emissions reduction target for the year 2020 that is 15 percent below 2007 emissions. The GHG Plan is consistent with AB 32 and sets the County on a path to achieve more substantial long-term reduction in

the post-2020 period. Implementation of the County's GHG Plan is achieved through the Development Review Process by applying appropriate reduction requirements to projects, which reduce GHG emissions. All new development is required to quantify the project's GHG emissions and adopt feasible mitigation to reduce project emissions below a level of significance. A review standard of 3,000 metric tons (MT) of CO<sub>2e</sub> per year is used to identify and mitigate project emissions. For projects exceeding 3,000 MT CO<sub>2e</sub> per year of GHG emissions, the developer may use the GHG Plan Screening Tables as a tool to assist with calculating GHG reduction measures and the determination of a significance finding. According to the GHG Plan, small projects that do not exceed 3,000 MTCO<sub>2e</sub> per year are considered to be consistent with the GHG Plan and have a less-than-significant individual and cumulative impact for GHG emissions.

## 7.2 Local Microscale Carbon Monoxide Standards

Because CO is nonreactive air pollutant that dissipates relatively quickly, ambient CO concentrations generally follow the spatial and temporal distributions of vehicular traffic. CO "hotspots"—localized areas of elevated CO concentrations—are often associated with intersections or other areas with high densities of motor vehicles. Any project that would cause carbon monoxide concentrations to exceed the CO standards shown in Table 2 at a given location (e.g., a particular intersection) would be considered significant.

## 8.0 AIR QUALITY IMPACT ASSESSMENT METHODOLOGY

The California Emissions Estimator Model Version 2013.2.2 (CalEEMod) was used to determine the anticipated air emissions as a result of the proposed project. CalEEMod was developed by the South Coast Air Quality Management District in collaboration with the other air districts of California to provide a model by which to calculate both construction emissions and operational emissions from a variety of land use projects. It calculates both the daily maximum and annual average emissions for criteria pollutants as well as total or GHG emissions. The model quantifies direct emissions from construction and operations (including vehicle use), as well as indirect emissions, such as GHG emissions from energy use, solid waste disposal, vegetation planting and/or removal, and water use. The model calculates mobile source emissions using EMFAC 2011 emission factors. EMFAC is the CARB model for estimating emissions from on-road vehicles operating in the state.



## 8.1 Construction Emissions Scenario

Construction of the project has the potential to create air quality and GHG emission impacts through the use of heavy-duty construction equipment and through vehicle trips generated from construction workers traveling to and from the project site. Fugitive dust emissions would primarily result from demolition and earthwork activities. Paving operations and the application of coatings and other building materials would emit VOCs. The assessment of construction air quality impacts considers each of these potential sources during each part of the construction phase.

The information contained in the construction scenario for the project was developed from empirical data for construction of comparable projects and was used in the assessment of potential construction impacts to air quality and transportation. On-site grading and construction equipment emissions for the project were calculated utilizing the CalEEMod computer model. Construction-crew commuting emissions as well as truck trips (deliveries, equipment transport, servicing) to the site were calculated with CalEEMod using crew and truck traffic estimates provided by the project proponent.

The project is expected to begin construction in the fourth quarter of 2015. Estimated construction emissions were modeled using CalEEMod to identify maximum daily emissions for each pollutant during each project construction activity. Construction emissions include all emissions associated with the construction equipment, worker trips, and on-road diesel truck traffic including deliveries and equipment transport. A traffic study to account for project-related traffic is also being prepared. Assumptions used in the air quality analysis include the following:

- The project will be completed over the five phases listed below.
  - Site Preparation (1 month)
  - Underground Work (6.5 months)
  - System Installation (5.5 months)
  - Testing (1 month)
  - Clean-up and Restoration (1 month)
- Trip length:
  - 10 percent of the project's workforce trips will live or be lodged in Barstow and have a 7-mile one-way trip length, 60 percent will originate in the greater Victorville area (south of the site via Interstate 15) and have a 34-mile one-way trip length, and the balance will drive up from the Inland Empire area or beyond. Trips in the latter category are counted when they enter the air basin south of

the project site on Interstate 15 (a one-way distance of approximately 60 miles). The weighted average workforce trip length is 78.2 miles, round trip.

- 40 percent of the project's vendor trips (concrete, sand, gravel, equipment deliveries, etc.) will originate in Barstow, 30 percent will originate in Victorville, and the balance will drive up from the Inland Empire area or beyond. Trips in the latter category are counted when they enter the air basin south of the project site on Interstate 15. The weighted average vendor trip length is 62.0 miles, round trip.
- For approximately 20 to 30 days during system installation, approximately 180 truck trips will occur for delivery of the solar PV panels to the site. These trips are counted when they enter the air basin south of the project site on Interstate 15. Each PV-delivery trip is 120 miles, round trip. Day-to-day trip amounts will vary widely from as much as 50 to as little as one.
- During the Site Preparation phase, fugitive dust will occur due to grading, trenching, road compaction, and grubbing. Other sources of fugitive dust (e.g. soil importing/exporting) do not apply to this project or are negligible in effect. The Clean-up and Restoration phase is anticipated to have similar fugitive-dust impacts.
  - The Site Preparation phase conservatively involves grading of the entire 234.47 acre project site.
  - The Clean-up and Restoration phase is conservatively estimated to involve 25 percent (58.6 acres) of the project site.
- Equipment types and quantity used to model project-related emissions were estimated using the figures from similar solar projects by the same project proponent, as well as similar solar projects by other proponents in San Bernardino County.
- Default parameters, such as the horsepower, load factor, and operational duration, were used for all construction equipment anticipated to be used for the project

The modeled construction phasing, equipment fleet, and trip counts are indicated in **Table 8**, below. Several construction phases may overlap however, the cumulative duration of construction is not expected to exceed 10 months. **Table 9** depicts the anticipated project's construction in terms of the type and number of equipment per month.

**Table 8.** Project construction characteristics used to analyze air quality impacts.

Phase Name/Duration	Equipment Quantity	Trips/Day
<b>1: Site Preparation (1 month/22 working days)</b> Staging areas established; set access points; runoff controls, barriers, and fencing installed; minimal grading and scraping.	1 Bore/Drill Rig	<b>Worker:</b> 16 (78.2-mile round trip) <b>Vendor:</b> 0 (62.0-mile round trip) <b>Total: 16</b>
	1 Cement/Mortar Mixer	
	2 Excavators	
	3 Graders	
	2 Rollers	
	1 Skid-Steer Loader	
	5 Generator Sets	
	3 Off-Highway Trucks (Pick-up)	
	1 Off-Highway Truck (Water)	
	2 Tractor/Loader/Backhoes	
	2 Rubber-Tired Dozers	
<b>2: Underground Work (6.5 months/141 working days)</b> Set manholes, excavate, concrete backfill, surface restoration, pulling cable, splicing, temporary preparation work on existing utility circuit, structure installation, transfer other utilities and conductor installation, wire clipping.	2 Dumper/Tender	<b>Worker:</b> 50 (78.2-mile round trip) <b>Vendor:</b> 4 (62.0-mile round trip) <b>Total: 54</b>
	5 Generator Set	
	1 Roller	
	3 Off-Highway Trucks (Pick-up)	
	1 Off-Highway Truck (Water)	
	3 Trenchers	
	4 Compactors	
	3 Tractor/Loader/Backhoe	
<b>3: System Installation (5.5 months/119 working days)</b> Installation of support beams, module rail assemblies, PV modules, inverters, transformers, and buried electrical cables. Concrete for footings, foundations, and pads for the transformers and inverters.	4 Forklifts	<b>Worker:</b> 115 (78.2-mile round trip) <b>Vendor:</b> 7 (62.0-mile round trip) <b>PV-Panel Delivery:</b> 50 <sup>5</sup> (120-mile round trip) <b>Total: 172</b>
	5 Generator Sets	
	6 Off-Highway Trucks (Pick-up)	
	3 Off-Highway Trucks (Other)	
	7 Off-Highway Trucks (Concrete)	
	1 Off-Highway Truck (Flatbed)	
	1 Off-Highway Truck (Water)	
	4 Augers	
	3 Pile Drivers	
	1 Other General Industrial Equip.	
<b>4: Testing (1 month/22 working days)</b> Test facility generation and connection to grid.	2 Generator Sets	<b>Worker:</b> 30 (78.2-mile round trip) <b>Vendor:</b> 0 (62.0-mile round trip) <b>Total: 30</b>
	3 Off-Highway Trucks (Pick-up)	
	5 Off-Highway Trucks (Other)	
<b>5: Clean-up/Restoration (1 month/21 working days)</b> Removal/recycling of construction waste; re-seeding as needed.	1 Grader	<b>Worker:</b> 20 (78.2-mile round trip) <b>Vendor:</b> 0 (62.0-mile round trip) <b>Total: 20</b>
	3 Off-Highway Trucks (Pick-up)	
	1 Off-Highway Truck (Water)	

<sup>5</sup> Approximate maximum daily rate. A total of approximately 180 truck trips for PV solar panel delivery are anticipated over a 20- to 30-day period. Day-to-day trip amounts will vary widely from as much as 50 to as little as one.

**Table 9.** Off-road construction equipment (pieces per month) for the project.

Equipment Type	Hp	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Total
Bore/Drill Rig	205	1	0	0	0	0	0	0	0	0	0	1
Cement/Mortar Mixer	9	1	0	0	0	0	0	0	0	0	0	1
Compactor	120	2	4	4	4	4	4	4	0	0	0	26
Dozer, Rubber-Tired	250	2	0	0	0	0	0	0	0	0	0	2
Dumper/Tender	16	1	2	2	2	2	2	2	0	0	0	13
Excavator	175	2	0	0	0	0	0	0	0	0	0	2
Forklift	75	0	0	0	4	4	4	4	4	2	0	22
Generator Set	7	7.5	5	5	10	10	10	10	5	3.5	1	67
Grader	175	3	0	0	0	0	0	0	0	0	1	4
Other Construction Eqmt. (Auger)	30	0	0	0	4	4	4	4	4	2	0	22
Other Construction Eqmt. (Pile Driver)	50	0	0	0	3	3	3	3	3	1.5	0	16.5
Other General Industrial Eqmt.	88	0	0	0	1	1	1	1	1	0.5	0	5.5
Roller	81	2.5	1	1	1	1	1	1	0	0	0	8.5
Skid-Steer Loader	65	1	0	0	0	0	0	0	0	0	0	1
Tractor/Loader/Backhoe	120	3.5	3	3	3	3	3	3	0	0	0	21.5
Trencher	175	1.5	3	3	3	3	3	3	0	0	0	19.5
Truck, Off-Hwy (Concrete)	250	0	0	0	7	7	7	7	7	3.5	0	38.5
Truck, Off-Hwy(Flatbed)	210	0	0	0	1	1	1	1	1	0.5	0	5.5
Truck, Off-Hwy (Other)	310	0	0	0	3	3	3	3	3	4	2.5	21.5
Truck, Off-Hwy (Pickup)	180	4.5	3	3	9	9	9	9	6	4.5	4.5	61.5
Truck, Off-Hwy (Water)	180	1.5	1	1	2	2	2	2	1	0.5	1	14
<b>Total</b>	--	34	22	22	57	57	57	57	35	22.5	10	373.5

Note: figures ending in “.5” indicate that a piece of equipment was used for one-half of a month.

The project's maximum daily labor force and delivery activity during construction are shown in **Tables 10 and 11**, respectively.

**Table 10.** Construction labor force (laborers per month with supervision) for the project.

	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10
<b>Working Hours Per Day</b>	8	8	8	8	8	8	8	8	8	8
<b>Working Days Per Week</b>	5	5	5	5	5	5	5	5	5	5
<b>Maximum Daily Labor Force (Number of Workers)</b>	66	50	50	165	165	165	165	115	115	50

**Table 11.** Construction delivery activity (round trips per month) for the project.

Vehicle Type	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Total
<b>Vendor Delivery Truck</b>	44	87	87	238	238	238	238	151	76	0	1,397
<b>PV Solar Panel Delivery Truck</b>	0	0	0	0	0	180	0	0	0	0	180
<b>Total</b>	44	87	87	238	238	418	238	151	76	0	1,577

## 8.2 Operational Emissions Scenario

The operational scenario used for this analysis is provided in **Table 12**, below. The project would be operated on an autonomous, unstaffed basis (only requiring routine maintenance staff) and monitored remotely from an existing off-site facility. It is anticipated that maintenance requirements will be minimal as the proposed project's PV arrays will operate with limited moving parts. No full-time staffing would be required to operate the facility; however one or two employees are expected to visit the site five days per week for routine maintenance and check-ups. Operational activities will be limited to monitoring plant performance and responding to utility needs for plant adjustment along with preventative and unscheduled maintenance. The project will operate during daylight hours only. Periodic module cleanings and quarterly maintenance activities might utilize 6 to 8 full-time workers for one to two weeks per quarter, or up to 40 days per year. No heavy equipment will be used during normal project operation. Operation and maintenance vehicles will include trucks (pickup, flatbed), forklifts, and loaders for routine and unscheduled maintenance, and water trucks for solar module washing. Large heavy-haul transport equipment may be brought to the site infrequently for equipment repair or replacement. All other assumptions (e.g. trip lengths, equipment parameters) remain the same as for the construction scenario.

**Table 12.** Project operational characteristics used to analyze air quality impacts.

Task/Duration	Equipment Quantity	Trips/Day
<b>1: Daily Monitoring (five days per week)</b>	None	<b>Worker:</b> 2 (78.2-mile round trip)
<b>2: Routine Maintenance (quarterly, 40 days per year)</b>	1 Off-Highway Truck (pick-up)	<b>Worker:</b> 8 (78.2-mile round trip) <b>Vendor:</b> 2 (62.0-mile round trip)
	1 Off-Highway Truck (water truck)	
	1 Off-Highway Truck (flatbed)	
	1 Forklift	
	1 Tractor/Loader/Backhoe	

## 8.3 Decommissioning Scenario

When the arrays are removed after the project's lifetime, the land will be largely unaltered from its natural state. The project would utilize BMPs to ensure the collection and recycling of modules to the extent feasible. All decommissioning activities would adhere to the requirements of the appropriate governing authorities and in accordance with all applicable federal, State, and County regulations. The emissions generated from the decommissioning of the project are anticipated to be similar to those generated during the construction phase. As a result, the conclusions regarding the emissions of the project's construction phase and decommissioning phase are the same.

## 9.0 PROJECT IMPACTS

### 9.1 Construction Impacts (Short-Term)

#### Unmitigated Construction Air Emissions for Criteria Air Pollutants

The project-related maximum daily and annual unmitigated emissions for criteria pollutants, as calculated by CalEEMod, are shown respectively in **Tables 13** and **14**, below. (Greenhouse gas emissions are considered in Section 9.4.) The full CalEEMod output is provided in Appendix A. The MDAQMD emissions for criteria pollutants Pb and H<sub>2</sub>S are not included in Tables 13 and 14 because PV solar projects do not involve these emissions to any quantifiable degree. Refer to Section 6.1 for a discussion of the typical sources of Pb and H<sub>2</sub>S. Mitigated emissions are shown in Section 10.

**Table 13.** Project-related maximum daily unmitigated construction emissions by construction phase and in total (lb/day).

	VOCs	NO <sub>x</sub>	CO	SO <sub>x</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>
Site Preparation	12	123	63	<1	14	31
Underground Work	11	108	73	<1	7	9
System Installation	17	161	111	<1	9	15
Testing	6	62	37	<1	3	4
Clean-Up and Restoration	3	34	20	<1	2	6
<b>Maximum Daily Emission Rate</b>	<b>28</b>	<b>259</b>	<b>180</b>	<b>&lt;1</b>	<b>21</b>	<b>40</b>
<b>Significance Threshold</b>	<b>137</b>	<b>137</b>	<b>548</b>	<b>137</b>	<b>82</b>	<b>82</b>
<b>Significant?</b>	<b>NO</b>	<b>YES</b>	<b>NO</b>	<b>NO</b>	<b>NO</b>	<b>NO</b>

**Table 14.** Project-related annual unmitigated construction emissions by construction phase and in total (tons/year).

	VOCs	NO <sub>x</sub>	CO	SO <sub>x</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>
Site Preparation	0.13	1.35	0.70	<0.01	0.15	0.34
Underground Work	0.74	7.22	5.13	0.01	0.44	0.64
System Installation	1.04	9.58	6.79	0.01	0.53	0.87
Testing	0.06	0.68	0.41	<0.01	0.03	0.05
Clean-Up and Restoration	0.04	0.36	0.22	<0.01	0.02	0.06
<b>Total Annual Emissions</b>	<b>2.01</b>	<b>19.19</b>	<b>13.25</b>	<b>0.03</b>	<b>1.17</b>	<b>1.96</b>
<b>Significance Threshold</b>	<b>25</b>	<b>25</b>	<b>100</b>	<b>25</b>	<b>15</b>	<b>15</b>
<b>Significant?</b>	<b>NO</b>	<b>NO</b>	<b>NO</b>	<b>NO</b>	<b>NO</b>	<b>NO</b>

Because the project's emission rates are anticipated to exceed the daily thresholds-of-significance for NO<sub>x</sub>, the project requires the implementation of mitigation measures to ensure that construction emissions do not exceed the established threshold. Mitigation measures to address these impacts are discussed in Section 10.

### Fugitive Dust

Fugitive dust emissions are generally associated with land clearing and exposure of soils to the air and wind, and cut-and-fill grading operations. Dust generated during construction varies substantially on a project-by-project basis, depending on the level of activity, the specific operations, and weather conditions at the time of construction. It is assumed that soil will be balanced on site to minimize the need for import or export of soil during project construction.

Construction emissions can vary greatly depending on the level of activity, the specific operations taking place, the equipment being operated, local soils, weather conditions, and other factors. The proposed project will be required to comply with MDAQMD Rules 402 and 403 to control fugitive dust, including preparation of a dust control plan pursuant to MDAQMD Rule 403.2(c)(3). Compliance with these regulations will reduce particulate matter emissions below the unmitigated levels shown in Tables 13 and 14. In particular, the maximum daily PM<sub>10</sub> emission level that in Table 13 is anticipated to be above the threshold-of-significance without mitigation will be reduced to a level that is below the threshold-of-significance after complying with MDAQMD Rule 402, as illustrated in Table 19 and Section 10, below.



## Odors

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Heavy-duty equipment in the project area during construction would emit odors. However, the construction activity would be short-term, would be dispersed throughout the project site, and would cease to occur after construction is completed. No other sources of objectionable odors have been identified for the proposed project.

The proposed project is not anticipated to emit objectionable odors to any significant degree (i.e., levels contrary to MDAQMD Rule 402 regarding nuisances). Therefore, objectionable odors affecting a substantial number of people would not occur as a result of the proposed project and any potential impact would be less-than-significant.

## Sensitive Receptors

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The project will not expose sensitive receptors to substantial pollutant concentrations. The greatest potential for exposure of sensitive receptors to air contaminants would occur during the temporary construction phase, when soil would be disturbed and equipment would be used for site grading, materials delivery, and panel construction. These activities may expose residences in the area to short-term construction air quality impacts associated with construction exhaust emissions generated from construction equipment, vegetation clearing, construction workers' commute, and construction material hauling during the construction period. However, diesel particulate matter generated from construction would be limited to the 10-month construction period.

MDAQMD Criterion Number 4 requires industrial projects within 1,000 feet of a sensitive receptor to assess whether a project exposes sensitive receptors to substantial pollutant concentrations, including those resulting in a cancer risk greater than or equal to 10 in a million and/or a Hazard Index (HI) (non-cancerous) greater than or equal to 1. The nearest sensitive receptors are the residential uses on adjacent parcels (described in Section 5.4) that are approximately 100 feet from the project's boundary. The proposed project could therefore be characterized as an industrial use within 1,000 feet of a residence. Although solar facilities typically generate substantially fewer emissions than many traditional industrial uses, the project proponent has prepared a Health Risk Assessment (HRA) pursuant to MDAQMD's Criterion Number 4. The HRA, attached hereto as Appendix B, indicates that no sensitive receptor within 1,000 feet of the project will be exposed to a cancer risk greater than or equal to 10 in a million and/or a non-cancerous HI greater than or equal to 1 as a result of construction activities associated with the project.

The project will not emit hazardous emissions or handle hazardous or acutely hazardous materials, substances or waste within one-quarter mile of an existing or proposed school. The closest school is Lenwood Elementary School, approximately 1.8 miles to the south of the project site.

In short, construction of the project will not expose sensitive receptors to substantial pollutant concentrations because the project's emissions will not exceed the MDAQMD criteria pollutant thresholds-of-significance when mitigation is incorporated (as discussed in Section 10) and will not expose sensitive receptors to toxic air contaminants at any significant level. Impacts to sensitive receptors are therefore considered less-than-significant with mitigation incorporated.

## 9.2 Long-Term Air Quality Impacts

### Operational Emissions for Criteria Air Pollutants

Long-term operational air emissions at the project property are likely to result from mobile sources due to scheduled maintenance that would be conducted and any necessary repairs throughout the lifecycle of the project. The operational-related maximum daily and annual emissions for criteria air pollutants, as calculated by CalEEMod, are shown respectively in **Tables 15** and **16**, below. (Operational greenhouse gas emissions are considered in Section 9.4.) The full CalEEMod output is provided in Appendix A. The MDAQMD emissions for criteria pollutants Pb and H<sub>2</sub>S are not included in Tables 15 and 16 because PV solar projects do not involve these emissions to any quantifiable degree. Refer to Section 6.1 for a discussion of the typical sources of Pb and H<sub>2</sub>S.

**Table 15.** Project-related maximum daily operational emissions (lb/day).

	VOCs	NO <sub>x</sub>	CO	SO <sub>x</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>
Operational Onroad	<1	1	2	<1	<1	<1
Operational Offroad	2	21	11	<1	1	1
<b>Maximum Daily Emission Rate</b>	<b>2</b>	<b>22</b>	<b>13</b>	<b>&lt;1</b>	<b>1</b>	<b>2</b>
<b>MDAQMD Significance Threshold</b>	<b>137</b>	<b>137</b>	<b>548</b>	<b>137</b>	<b>82</b>	<b>82</b>
<b>Significant?</b>	<b>NO</b>	<b>NO</b>	<b>NO</b>	<b>NO</b>	<b>NO</b>	<b>NO</b>

**Table 16.** Project-related annual operational emissions (tons/year).

	VOCs	NO <sub>x</sub>	CO	SO <sub>x</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>
Operational Onroad	0.01	0.08	0.23	<0.01	0.01	0.04
Operational Offroad	0.09	0.86	0.44	<0.01	0.05	0.05
<b>Total Annual Emissions</b>	<b>0.10</b>	<b>0.94</b>	<b>0.67</b>	<b>&lt;0.01</b>	<b>0.05</b>	<b>0.09</b>
<b>Significance Threshold</b>	<b>25</b>	<b>25</b>	<b>100</b>	<b>25</b>	<b>15</b>	<b>15</b>
<b>Significant?</b>	<b>NO</b>	<b>NO</b>	<b>NO</b>	<b>NO</b>	<b>NO</b>	<b>NO</b>

The project's operations emissions for criteria air pollutants are less than the daily and annual MDAQMD thresholds-of-significance for criteria pollutants. Because all operations emissions are below MDAQMD daily and annual thresholds-of-significance, the project will not violate any air quality standard or contribute substantially to an existing or projected air quality violation and will present a less-than-significant impact in this regard.

## Fugitive Dust

Operational dust emissions will be minimal due to the low amount of activity required to maintain and operate the unmanned solar facility. The particulate matter emission figures presented in Table 15 show that daily total operational emissions will be 41 and 82 times lower than the applicable MDAQMD threshold for PM<sub>10</sub> and PM<sub>2.5</sub> emissions, respectively, which include dust.

## Odors

The generation of electricity by photovoltaic panels does not generate odors. No significant odor impacts related to project operation and maintenance are anticipated due to the nature of the use and the short-term and limited extent of potential sources (such as diesel exhaust from the occasional truck delivering maintenance equipment), as well as the intervening distance to sensitive receptors.

Operation of the proposed project will not emit objectionable odors to any significant degree (i.e. levels contrary to MDAQMD Rule 402 regarding nuisances). Therefore, objectionable odors affecting a substantial number of people would not occur as a result of operation of the proposed project and any potential impact would be less-than-significant.

## Sensitive Receptors

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There will be no air quality impacts from the generation of electricity from photovoltaic panels because the operation of photovoltaic panels does not generate emissions that would negatively impact air quality. Emissions from operations and maintenance vehicles will be minimal: as shown in Tables 15 and 16, daily and annual total operational emissions will be far below applicable MDAQMD thresholds.

MDAQMD Criterion Number 4 requires industrial projects within 1,000 feet of a sensitive receptor to assess whether a project exposes sensitive receptors to substantial pollutant concentrations, including those resulting in a cancer risk greater than or equal to 10 in a million and/or a Hazard Index (HI) (non-cancerous) greater than or equal to 1. The nearest sensitive receptors are the residential uses on adjacent parcels (described in Section 5.4) that are approximately 100 feet from the project's boundary. The proposed project could therefore be characterized as an industrial use within 1,000 feet of a residence. Although solar facilities typically generate substantially fewer emissions than many traditional industrial uses, the project proponent has prepared a Health Risk Assessment (HRA) pursuant to MDAQMD's Criterion Number 4. The HRA, attached hereto as Appendix B, indicates that no sensitive receptor within 1,000 feet of the project will be exposed to a cancer risk greater than or equal to 10 in a million and/or a non-cancerous HI greater than or equal to 1 as a result of project operations.

The project will not emit hazardous emissions or handle hazardous or acutely hazardous materials, substances or waste within one-quarter mile of an existing or proposed school. The closest school is Lenwood Elementary School, approximately 1.8 miles to the south of the project site.

In short, project operations will not expose sensitive receptors to substantial pollutant concentrations because the project's emissions will not exceed the MDAQMD criteria pollutant thresholds of significance when mitigation is incorporated (as discussed in Section 10) and would not expose sensitive receptors to toxic air contaminants at any significant level. Impacts to sensitive receptors are therefore considered less-than-significant.

### 9.3 Localized Carbon Monoxide Concentrations

#### Construction Phase

The project's construction would produce CO emissions as a consequence of on- and off-road equipment. Because the MDAQMD's *California Environmental Quality Act (CEQA) and Federal Conformity Guidelines* handbook does not specify a procedure for determining significance of projects on localized CO concentrations, the MDAQMD was contacted directly. According to the MDAQMD, because the construction phase of this project is relatively short-term and temporary, localized CO impacts for the project are considered less-than-significant.<sup>6</sup>

#### Operational Phase

Solar PV electrical generation does not involve CO emissions. Because the project will not have a full time staff and limited motor vehicle use associated with routine maintenance operations, localized CO impacts during the project's operation will not be significant.

### 9.4 Air Quality Plan Conformity

CEQA requires that certain proposed projects be analyzed for consistency with all applicable air quality plans. Per the MDAQMD Guidelines, "A project is conforming if it complies with all applicable District rules and regulations, complies with all proposed control measures that are not yet adopted from the applicable plan(s), and is consistent with the growth forecasts in the applicable plan(s) (or is directly included in the applicable plan). Conformity with growth forecasts can be established by demonstrating that the project is consistent with the land use plan that was used to generate the growth forecast."

The proposed project will accommodate the anticipated population and business growth in the region and is not itself a growth-inducing project. The project conforms to applicable attainment and maintenance plans (MDAQMD Significance Criterion Number 3) because it is consistent with the existing zoning and general plan use designations of the project site, requiring only a CUP. Plan conformity impacts are therefore less-than-significant.

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<sup>6</sup> Per a telephone conversation between GCE (Ross Brown) and MDAQMD (Alan De Salvio, Deputy Director of Operations) on February 6, 2015.

## 9.5 GHG Emissions

The San Bernardino County Greenhouse Gas Emissions Reduction plan sets forth a significance threshold of 3,000 metric tons of CO<sub>2</sub> equivalent per year. Greenhouse gas emissions resulting from the construction and operation of the project are quantified and reported in the CalEEMod output in Appendix A. **Table 17** presents a summary of these emissions. The greenhouse gas emissions that are anticipated during the project's construction were amortized over the 30-year lifespan of the Longboat Solar Project. Dividing construction-period greenhouse gas emissions over the project's lifespan permits a direct comparison of the construction and operational emissions. Also included in the operational emissions is an accounting of sulfur hexafluoride (SF<sub>6</sub>). This greenhouse gas can slowly leak from electrical components such as switch gears. It is conservatively estimated that the amount of SF<sub>6</sub> emitted annually over the project's lifetime will have the same global warming potential as 1.10 tons of CO<sub>2</sub>.

**Table 17.** Project-Related Greenhouse Gas Emissions (tons/year).

	Bio-CO <sub>2</sub> <sup>1</sup>	NBio-CO <sub>2</sub> <sup>1</sup>	Total CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	CO <sub>2(e)</sub> <sup>2</sup>
Construction Emissions	0	2,515.73	2,515.73	0.56	0	<b>2,527.59</b>
Construction Emissions/30 Years <sup>3</sup>	0	83.86	83.86	0.02	0	<b>84.25</b>
Operational Emissions	0	131.22	131.22	0.03	0	<b>131.79</b>
Operational SF <sub>6</sub> gas <sup>4</sup>	--					<b>1.10</b>
Combined Lifetime Annual Average	--					<b>217.14</b>
<b>Significance Threshold</b>	--					<b>3306*</b>
<b>Significant?</b>	--					<b>NO</b>

\*This is the GHG Plan annual threshold for CO<sub>2(e)</sub> of 3,000 metric tons expressed as short tons. 1 metric ton = 1.102 short tons.

<sup>1</sup> Bio-CO<sub>2</sub> = Biologically-derived; NBio-CO<sub>2</sub> = Human-generated (e.g., construction equipment).

<sup>2</sup> CO<sub>2</sub> equivalent; the sum of CO<sub>2</sub> plus the amount of CO<sub>2</sub> that has the equivalent global warming potential as the stated amount of CH<sub>4</sub>.

<sup>3</sup> Estimated construction emissions divided by a 30-year project life.

<sup>4</sup> Assumed based on scaling of other solar projects and standard leakage rate.

As can be seen in Table 17, construction and operation emissions over the 30-year life of the project will be approximately 217.14 tons (197.04 metric tons) of CO<sub>2e</sub> per year. This is far below the San Bernardino GHG Plan threshold of 3,306 tons (3,000 metric tons) CO<sub>2e</sub> per year. These project GHG emissions are consistent with the County of San Bernardino's September 2011 *Greenhouse Gas Emissions Reduction Plan*.

Moreover, construction of the solar facility will generate "green" electric power that would otherwise be produced with fossil fuels with much higher GHG emissions. The project would produce an average of 16,059 megawatt-hours (MWh) of electricity per year. Using an emission

factor of 0.61 tons CO<sub>2e</sub> per MWh<sup>7</sup>, generating the same amount of electricity using natural gas would produce approximately 9,796 tons (8,889 metric tons) CO<sub>2e</sub> per year. When taking into account the annual emissions of approximately 217 tons CO<sub>2e</sub> that would be produced in the construction and maintenance of the project, the project would prevent the emission of approximately 9,579 tons (8,692 metric tons) of CO<sub>2e</sub> per year over electricity produced with natural gas. Therefore, the project would be a net greenhouse-gas benefit.

Project greenhouse gas emission impacts are therefore considered to be less-than-significant.

## 9.6 Cumulative Air Quality Impacts

When viewed from a plan-based perspective, the geographic scope for potential cumulative impacts to regional air resources is the MDAB. If the project would result in an increase in a criteria pollutant that has an existing adverse cumulative effect (i.e., the MDAB is classified as non-attainment of the criteria pollutant) and the increase would be more than the respective federal *de minimis* level or MDAQMD threshold, when combined with the emissions associated with other past, present or reasonably foreseeable future actions, the project would be considered to contribute to a significant cumulative effect to regional air resources. As shown in Tables 13 through 16, the project's construction and operations emissions would be less than the MDAQMD significance thresholds except for emissions of NO<sub>x</sub> on an annual basis and NO<sub>x</sub> and PM<sub>10</sub> on a daily basis during construction. However, as is discussed in Section 10, these threshold-of-significance exceedances would be mitigated to levels that are less-than-significant. Therefore, the project would not contribute to violations of air quality standards or result in a cumulatively considerable increase in emissions for which the MDAB is in nonattainment. The project's contribution to cumulative impacts would therefore be less than considerable.

When viewed from a project-based perspective, the geographic scope for air quality cumulative impacts is a 6-mile radius for regionally-based impacts and a 1-mile radius for sensitive receptor impacts. These geographic scopes were taken from Kern County's *Guidelines for Preparing an Air Quality Assessment for use in Environmental Impact Reports* because guidance on assessing cumulative air quality impacts from MDAQMD or San Bernardino County is not known to exist. Also, the California Energy Commission typically applies a 6-mile radius for its air quality

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<sup>7</sup> United States Energy Information Administration. Frequently Asked Questions: How much carbon dioxide is produced per kilowatt-hour when generating electricity with fossil fuels? (website). Last updated 17 April 2014 Available at < <http://www.eia.gov/tools/faqs/faq.cfm?id=74&t=11>>.

cumulative analyses for fossil-fuel fired power plant operating emissions; this standard is considered conservative for this much cleaner renewable energy project. These geographic scopes of analysis are appropriate for project-based cumulative air quality analysis because air emissions released from a source are diluted very rapidly. Because of this, projects that are scheduled concurrently in the same area as the Longboat Solar Project are the only projects considered capable of contributing to cumulative impacts.

With regard to sensitive receptors, for the emissions of any two or more projects to have the potential for significant cumulative downwind concentrations at any given fixed sensitive receptor location, they must both be in close proximity to limit the downwind dispersion from one site to the other; also, typically, one of the projects must be able to cause an air quality standard exceedance on its own. Therefore, only projects within 1 mile of the Proposed Action are considered projects that could, together with the Proposed Action, cause significant cumulative impacts to fixed sensitive receptor locations. It is important to note that the geographic-scope standard of 1 mile and the sensitive-receptor location standard of 1,000 feet in MDAQMD Criterion 4 are separate concepts. Stated differently, the potential for cumulative significant impacts to sensitive receptors within 1,000 feet of a proposed project is limited to the proposed project and other projects within a 1-mile radius of the proposed project.

The identification of cumulative projects for air quality evaluation purposes is geographically limited (no more than 6 miles) because downwind dispersion reduces the cumulative impacts from project emissions to minimal levels after this distance. The emission sources for this project are all ground-based with minimal exhaust plume buoyancy, so the impacts from the project emissions would be highest at the project fence line and would decrease rapidly with distance.

A list of existing, proposed, and reasonably-foreseen projects is provided below in **Table 18**.



**Table 18.** Other projects near the Longboat Solar Project site.

Project Name/Proponent	Project Description	Status	Approximate Distance to Project
Green Valley Foods Improvements	Establish a 90,000 sf surface waste improvement pond.	Unlikely to be built	Adjacent to project site
State Route 58 Hinkley Expressway Project	Widen and realign existing 2-lane SR-58 to 4-lane expressway from 2.4 miles west of Hidden River Road to 0.7 mile east of Lenwood Road.	Project is anticipated to begin 1 June 2015.	Eastern terminus of is approximately 0.25 mile northwest of the northern parcel of project on SR-58.
Martinsville Specific Plan	315-acre specific plan for uses including residential and golf course development.	Comes before City of Barstow Planning Commission in March 2015. Negative Declaration proposed.	4 miles to the south. Approximate location: south of Lenwood Road; west of I-15.
Abengoa Mojave Solar Project	280-MW (gross) Parabolic Trough Solar Generating Facility	In Operation	12 miles to the northwest (Lockhart, CA)
NREL Solar Electric Generating Stations VIII and IX	178-MW (gross) Parabolic Trough Solar Generating Facility	In Operation	15 miles to the northwest (Lockhart, CA)
Nursery Products, LLC	Bio-solids and Greenwaste Composting Facility	In Operation	15 miles to the west (Hinkley, CA)
Sunlight Partners, LLC	4.5-MW Photovoltaic Solar Generating Facility	Permits Issued as of February 2015, construction status unknown.	16 miles to the southwest (Helendale, CA)
NREL Solar Electric Generating Stations I and II	46.8-MW (gross) Parabolic Trough Solar Generating Facility	In Operation	16 miles to the southeast (Daggett, CA)
Sunray Energy 2, LLC	44-MW Solar Generating Facility	Under Review as of February 2015	16 miles to the southeast (Daggett, CA)
Silver Valley	20-MW Solar Generating Facility	Conditionally Approved; No Permits Issued, Time Extension Approved as of February 2015.	18 miles to the northeast (E. side of Sunrise Canyon Rd., approx. 3.5 miles north of I-15 and Minneola Rd.)
Alamo Solar, LLC	20-MW Photovoltaic Solar Generating Facility	Approved April 2014; Status Unknown	23 miles to the southwest (Oro Grande, CA)
Solutions for Utilities, Inc. Phase 1&2(Now Soitec)	3-MW Solar Generating Facility	In Operation	24 miles to the southeast (Northwest corner of Cottonwood Road and Mountain View Road).

Project Name/Proponent	Project Description	Status	Approximate Distance to Project
Soltech Solar (Newberry Springs)	2-MW Solar Generating Facility	Conditionally Approved; No Permits Issued, Time Extension Approved as of February 2015.	26 miles to the northeast (Northeast corner of Camelot Drive and Desert View Road)
NREL Solar Electric Generating Stations III through VII	169-MW (gross) Parabolic Trough Solar Generating Facility	In Operation	26 miles to the west-northwest (Kramer Junction, CA)
Boulevard Associates	191-MW Solar Generating Facility	Conditionally Approved; No Permits Issued, Time Extension Approved as of February 2015.	26 miles to the west-northwest (Kramer Junction, CA)

Of all the projects listed in Table 18, the proposed project at the Green Valley Foods facility (the cheese-making facility mentioned previously) and the State Route 58 Hinkley Expressway Project are within the 6-mile radius for regionally-based impacts and the 1-mile radius for sensitive-receptor cumulative impacts. The Martinsville specific plan is within the 6-mile radius for regionally-based impacts. Discussion of these projects is provided below:

- The Green Valley Foods project has not been built and likely will not be built during any known timeframe because the reason for its proposal—to properly dispose of process water from the facility—is being accomplished by transporting the process water off-site to an approved wastewater facility.
- The State Route 58 Hinkley Expressway Project (Expressway Project) is anticipated to begin 1 June 2015. The eastern terminus of the Expressway Project will be an interchange to replace the signalized intersection of State Route 58 and Lenwood Road. With respect for the potential of cumulative impacts involving the Expressway Project and the Longboat Solar Project, the highest potential for impacts would be realized if work on the Lenwood Road interchange and the Longboat Solar Project occurred simultaneously. As of February 2015, the California Department of Transportation has not received scheduling specifics from the contractor.<sup>8</sup> However, Longboat Solar's contribution to significant cumulative air quality impacts on a regional basis is anticipated to be less than cumulatively considerable because the Longboat Solar

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<sup>8</sup> California Department of Transportation. *State Route 58 (SR-58) Hinkley Expressway Project Final Environmental Impact Report/Environmental Impact Statement*. June 2013. Available at < [http://dot.ca.gov/dist8/projects/san\\_bernardino/sr58/hinkley/index.htm](http://dot.ca.gov/dist8/projects/san_bernardino/sr58/hinkley/index.htm)>.

Project will not exceed the MDAQMD thresholds-of-significance in Table 6 when mitigation is incorporated (as discussed in Section 10). Nor, for the same reasons, is the proposed project expected to make a cumulatively considerable contribution to effects on sensitive receptors, subject to MDAQMD confirmation along the lines described in the sensitive receptor analyses above.

- The Martinsville Specific Plan plans for future residential and golf course development. No timetable for development has been proposed. According to the City of Barstow Community Development Department, a CEQA Negative Declaration will be submitted as part of the hearing before the City of Barstow Planning Commission meeting which is anticipated to occur in March 2015. The Longboat Solar project will not make a cumulatively considerable contribution to any significant cumulative air quality impacts in association with the Martinsville Specific Plan because the Longboat Solar Project will not exceed the MDAQMD thresholds-of-significance in Table 6 when mitigation is incorporated (as discussed in Section 10). The Martinsville Specific Plan project is also outside the one-mile cumulative range for assessment of potential cumulative impacts to sensitive receptors.

The area in which the project site is located is classified as “nonattainment” for PM<sub>10</sub>, PM<sub>2.5</sub>, and O<sub>3</sub>. Construction of the project would contribute to the existing nonattainment status. Therefore, the proposed project would exacerbate nonattainment of air quality standards within the air basin and contribute to adverse cumulative air quality impacts. However, because the project will not exceed the MDAQMD thresholds-of-significance for any air pollutant with mitigation measures incorporated (as discussed in Section 10) and because the known existing, planned, or reasonably-foreseeable projects within the cumulative-impact study area will not produce emissions of sufficient quantity that could combine with those of the project and cause significant impacts, the contribution of the project to significant cumulative air quality impacts would be below the level of significance.

## 10.0 MITIGATION MEASURES

As discussed in Section 9.1, the project’s construction would generate emissions that are higher than the MDAQMD significance threshold for NO<sub>x</sub> on a daily basis. Measures to mitigate this exceedance to a level that is below the established threshold are discussed below.

## 10.1 Mitigation Measures for NO<sub>x</sub>

Diesel engines powering off-road equipment will be responsible for the largest source of NO<sub>x</sub> emissions during project construction. However, the mitigation measure presented below will ensure that the project's NO<sub>x</sub> emissions remain below the daily threshold-of-significance for NO<sub>x</sub>.

**MM AQ-1:** During construction of the project, all off-road diesel-powered pieces of equipment used by the construction contractors shall comply with the California Air Resources Board Tier 3 standard for off-road diesel engines.

## 10.2 Mitigated Criteria Emissions

The anticipated emissions for criteria air pollutants emitted during the construction phase of the project with mitigation measures incorporated are shown in **Tables 19 and 20** for daily and annual emissions, respectively. The assessment of mitigated emissions is included in the CalEEMod output in Appendix A.

**Table 19.** Project-related maximum daily mitigated construction emissions by construction phase and in total (lb/day).

	VOCs	NO <sub>x</sub>	CO	SO <sub>x</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>
Site Preparation	3	46	60	<1	6	13
Underground Work	3	42	68	<1	3	5
System Installation	6	84	126	<1	5	11
Testing	2	34	46	<1	2	3
Clean-Up and Restoration	1	15	22	<1	1	3
<b>Maximum Daily Emission Rate</b>	<b>8</b>	<b>126</b>	<b>192</b>	<b>&lt;1</b>	<b>8</b>	<b>18</b>
<b>Significance Threshold</b>	<b>137</b>	<b>137</b>	<b>548</b>	<b>137</b>	<b>82</b>	<b>82</b>
<b>Significant?</b>	<b>NO</b>	<b>NO</b>	<b>NO</b>	<b>NO</b>	<b>NO</b>	<b>NO</b>

**Table 20.** Project-related annual mitigated construction emissions by construction phase and in total (tons/year).

	VOCs	NO <sub>x</sub>	CO	SO <sub>x</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>
Site Preparation	0.03	0.51	0.66	<0.01	0.06	0.15
Underground Work	0.19	2.93	4.84	0.01	0.18	0.34
System Installation	0.33	5.03	7.71	0.01	0.31	0.63
Testing	0.02	0.37	0.52	<0.01	0.02	0.03
Clean-Up and Restoration	0.01	0.16	0.24	<0.01	0.01	0.03
<b>Total Annual Emissions</b>	<b>0.58</b>	<b>9.00</b>	<b>13.97</b>	<b>0.03</b>	<b>0.58</b>	<b>1.18</b>
<b>Significance Threshold</b>	<b>25</b>	<b>25</b>	<b>100</b>	<b>25</b>	<b>15</b>	<b>15</b>
<b>Significant?</b>	<b>NO</b>	<b>NO</b>	<b>NO</b>	<b>NO</b>	<b>NO</b>	<b>NO</b>

As indicated in Tables 19 and 20, the MDAQMD thresholds-of-significance for criteria pollutants are not exceeded when mitigation measures for NO<sub>x</sub> are implemented. With these mitigation measures, the project would not violate any air quality standard or contribute substantially to an existing or projected air quality violation and would present a less-than-significant impact to air quality.

## 11.0 REFERENCES

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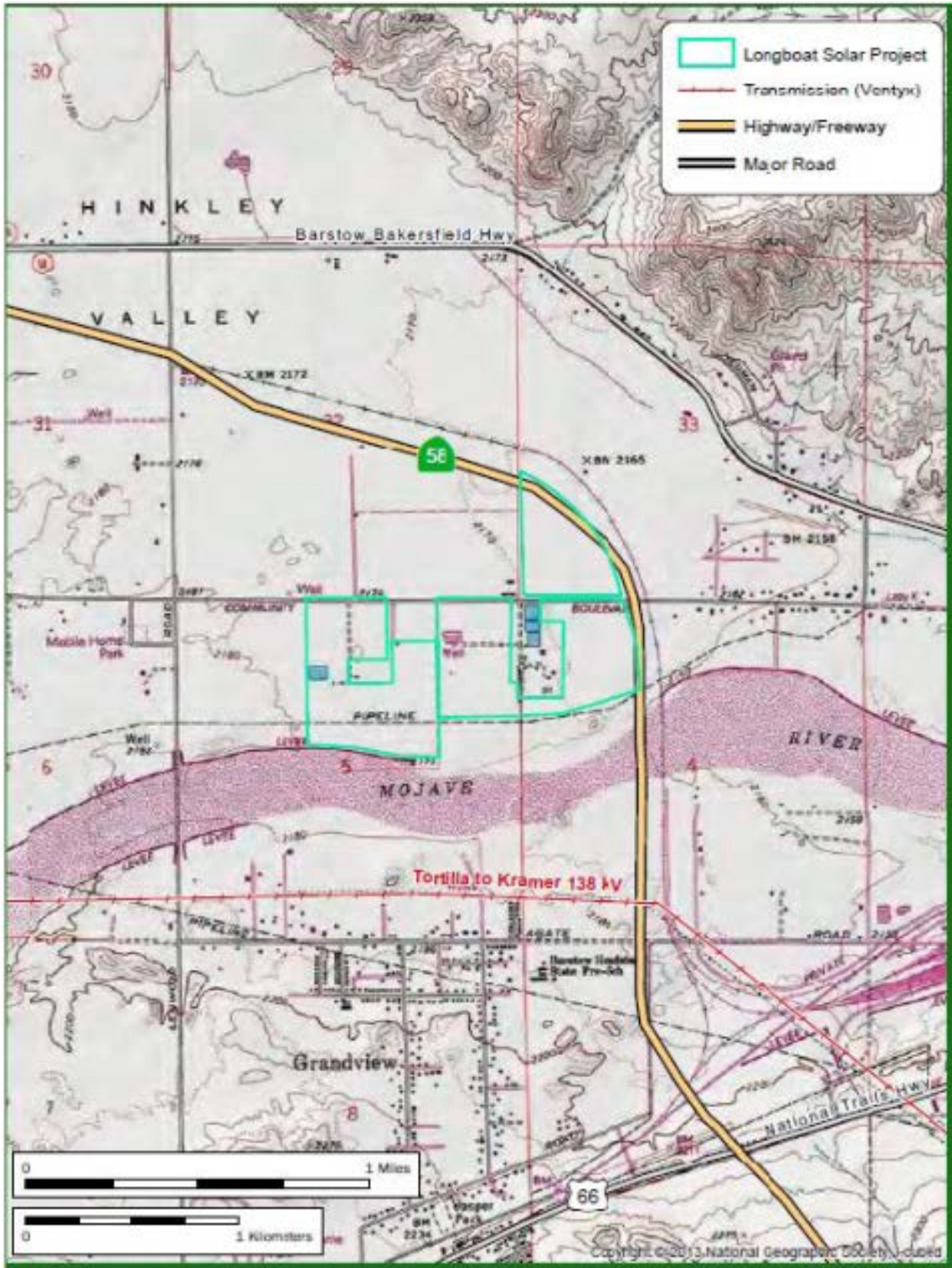
Available at <<http://www.mdaqmd.ca.gov/index.aspx?page=357>>.

# Figures



## **Figure 1: Site Vicinity Map**

Figure 1: Site Vicinity Map

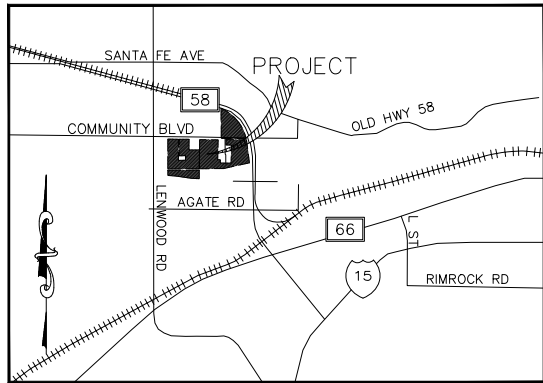


## **Figure 2: Preliminary Site Plan**

Figure 2: Preliminary Site Plan

# LONGBOAT SOLAR

VICINITY MAP  
NOT TO SCALE



### SURVEYOR'S CERTIFICATION

TO: LONGBOAT SOLAR, LLC, A DELAWARE LIMITED LIABILITY COMPANY,  
TICOR TITLE COMPANY OF CALIFORNIA AND \_\_\_\_\_

THIS IS TO CERTIFY THAT THIS MAP OR PLAT AND THE SURVEY ON WHICH IT IS BASED WERE MADE IN ACCORDANCE WITH THE 2011 MINIMUM STANDARD DETAIL REQUIREMENTS FOR ALTA/ACSM LAND TITLE SURVEYS, JOINTLY ESTABLISHED AND ADOPTED BY ALTA AND NSPS, AND INCLUDES ITEMS 3, 5, 6(a), 8, AND 11(a), OF TABLE A THEREOF. THE FIELD WORK WAS COMPLETED IN OCTOBER, 2013.

DATE OF PLAT OR MAP: OCTOBER 6, 2014



Gregory J. Smith, PLS 5511

Date

### LEGEND

- PARCEL LINE
- SECTION LINE
- FENCE LINE
- UNDERGROUND GAS LINE
- OVERHEAD POWER LINE
- POWER POLE, NO #
- GUY & WIRE
- GAS/WATER WELL
- IRRIGATION VALVE
- UNDERGROUND GAS LINE MARKER
- PROJECT BOUNDARY
- NOT A PART OF PROJECT



### SITE MAP

1" = 400'  
(FOR 22"X36" PLOT)

Temporary staging yard not  
part of the project's pro  
forma boundary

### LEGAL DESCRIPTION

THE LAND REFERRED TO HEREIN BELOW IS SITUATED IN THE COUNTY OF SAN BERNARDINO, STATE OF CALIFORNIA, AND IS DESCRIBED AS FOLLOWS:

PARCEL 1:

AREA 1 (PORTION OF APN: 0497-101-05 / HILLS RANCH, INC.):

BEING A PORTION OF THE EAST HALF OF THE NORTHEAST QUARTER OF SECTION 5, TOWNSHIP 9 NORTH, RANGE 2 WEST, SAN BERNARDINO BASE AND MERIDIAN, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT THE NORTHEAST CORNER OF SAID SECTION 5; THENCE ON AND ALONG THE EAST LINE OF SAID SECTION 5, S 01 DEGREES 35' 40" W, A DISTANCE OF 1307.84 FEET TO THE TRUE POINT OF BEGINNING;  
THENCE CONTINUING ALONG SAID EAST LINE, S 01 DEGREES 35' 40" W, A DISTANCE OF 547.15 FEET;  
THENCE LEAVING SAID EAST LINE, S 89 DEGREES 56' 46" W, A DISTANCE OF 1308.39 FEET TO THE WEST LINE OF THE EAST HALF OF THE NORTHEAST QUARTER OF SAID SECTION 5;  
THENCE ON AND ALONG SAID WEST LINE, N 01 DEGREES 7' 31" E, A DISTANCE OF 1817.04 FEET;  
THENCE S 88 DEGREES 58' 34" E, ON AND ALONG A LINE PARALLEL WITH, AND 60.00 FEET SOUTHERLY, AS MEASURED AT RIGHT ANGLES FROM THE NORTH LINE OF SAID SECTION 5, A DISTANCE OF 1156.77 FEET;  
THENCE S 01 DEGREES 35' 40" W, A DISTANCE OF 1247.84 FEET;  
THENCE S 88 DEGREES 58' 34" E, A DISTANCE OF 166.09 FEET TO THE POINT OF BEGINNING.

CONTAINING 49.78 ACRES, MORE OR LESS.

AREA 2 (PORTION OF APN: 0497-121-28 / HILLS RANCH, INC.):

BEING A PORTION OF THE NORTHWEST QUARTER OF SECTION 4, TOWNSHIP 9 NORTH, RANGE 2 WEST, SAN BERNARDINO BASE AND MERIDIAN, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT THE NORTHWEST CORNER OF SAID SECTION 4; THENCE ON AND ALONG THE WEST LINE OF SAID SECTION 4, S 01 DEGREES 35' 40" W, A DISTANCE OF 1511.08 FEET TO THE TRUE POINT OF BEGINNING;  
THENCE LEAVING SAID WEST LINE, S 88 DEGREES 58' 34" E, A DISTANCE OF 674.27 FEET;  
THENCE N 01 DEGREES 35' 40" E, A DISTANCE OF 1129.23 FEET;  
THENCE N 88 DEGREES 24' 20" W, A DISTANCE OF 350.00 FEET;  
THENCE N 01 DEGREES 35' 40" E, A DISTANCE OF 337.30 FEET;  
THENCE S 88 DEGREES 47' 17" E, A DISTANCE OF 1284.53 FEET;  
THENCE S 06 DEGREES 44' 25" E, A DISTANCE OF 1446.06 FEET;  
THENCE S 77 DEGREES 56' 47" W, A DISTANCE OF 1649.24 FEET;  
THENCE S 89 DEGREES 56' 46" W, A DISTANCE OF 214.99 FEET TO THE WEST LINE OF SAID SECTION 4;  
THENCE ON AND ALONG SAID WEST LINE, N 01 DEGREES 35' 40" E, A DISTANCE OF 343.91 FEET TO THE POINT OF BEGINNING.

CONTAINING 45.12 ACRES, MORE OR LESS.

AREA 3 (PORTION OF APN: 0497-071-40 / HILLS RANCH, INC.):

BEING A PORTION OF THE SOUTHWEST QUARTER OF SECTION 33, TOWNSHIP 10 NORTH, RANGE 2 WEST, SAN BERNARDINO BASE AND MERIDIAN, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

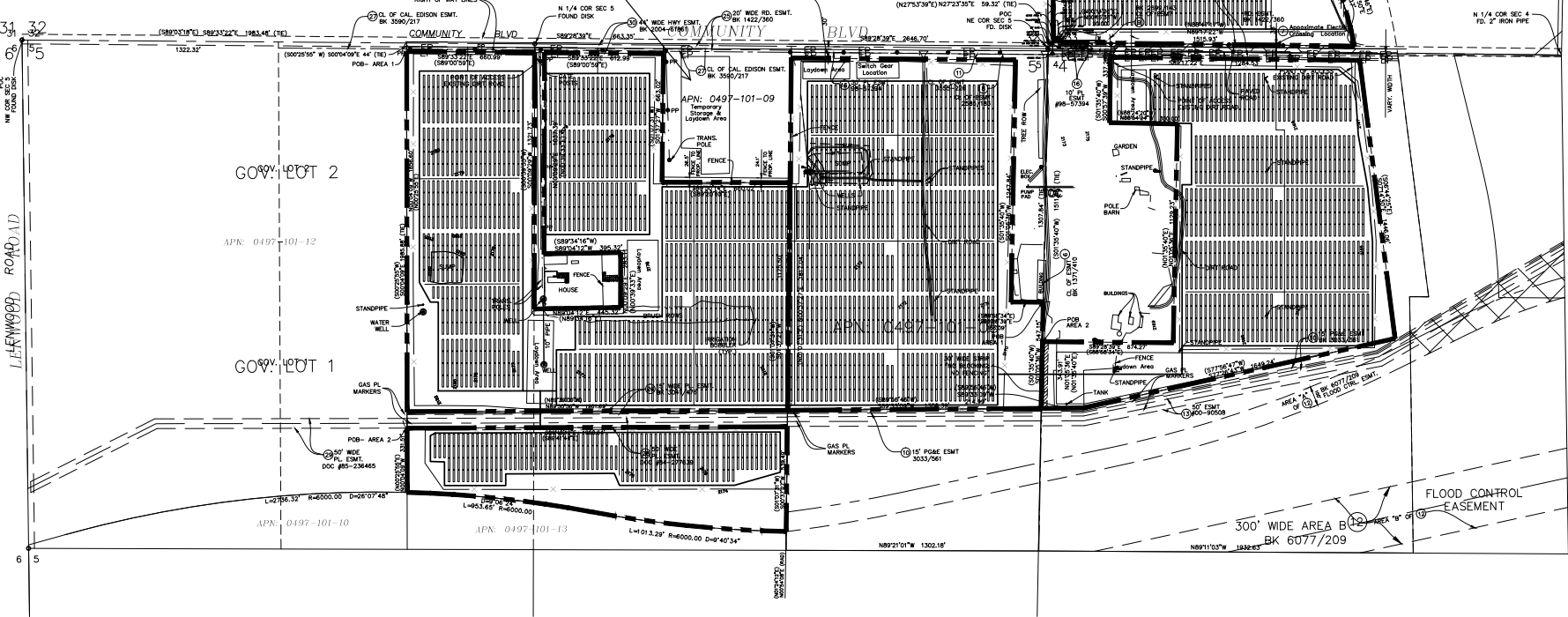
COMMENCING AT THE SOUTHWEST CORNER OF SAID SECTION 33; THENCE N 27 DEGREES 53' 39" E, A DISTANCE OF 59.32 FEET TO THE TRUE POINT OF BEGINNING;  
THENCE N 00 DEGREES 14' 26" E, A DISTANCE OF 1863.57 FEET TO THE BEGINNING OF A NON-TANGENT CURVE CONCAVE TO THE SOUTHWEST, HAVING A RADIUS OF 2680.02 FEET WITH A RADIAL LINE TO SAID POINT BEARS N 25 DEGREES 08' 39" E;  
THENCE ALONG SAID CURVE SOUTHEASTERLY THROUGH A CENTRAL ANGLE OF 28 DEGREES 34' 01" AN ARC DISTANCE OF 1435.94 FEET TO A COMPOUND CURVE CONCAVE TO THE SOUTHWEST HAVING A RADIUS OF 2567.02 FEET;  
THENCE SOUTHEASTERLY ALONG SAID CURVE THROUGH A CENTRAL ANGLE OF 24 DEGREES 28' 29" AN ARC DISTANCE OF 1096.54 FEET;  
THENCE S 17 DEGREES 44' 46" E, A DISTANCE OF 21.17 FEET TO THE NORTHERLY RIGHT OF WAY LINE OF COMMUNITY BOULEVARD;  
THENCE ALONG SAID NORTHERLY RIGHT OF WAY LINE, BEING 33.00 FEET NORTHERLY, AS MEASURED AT RIGHT ANGLES TO THE SOUTH LINE OF SAID SECTION 33, N 88 DEGREES 47' 17" W, A DISTANCE OF 1515.93 FEET;  
THENCE N 00 DEGREES 14' 26" E, A DISTANCE OF 20.00 FEET;  
THENCE N 88 DEGREES 47' 17" W, A DISTANCE OF 40.00 FEET TO THE POINT OF BEGINNING.

CONTAINING 44.67 ACRES, MORE OR LESS.

SAID AREAS 1, 2 AND 3 CONTAIN 139.57 ACRES, MORE OR LESS.

T.10N., R.2W.

T.9N., R.2W.



P.O. BOX 81626  
BAKERSFIELD, CA 93380  
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DATE: 08/20/14  
SCALE: AS SHOWN  
DRAWN: DL  
APPROVED:

DATE: 08/27/14  
09/15/14  
10/06/14

REVISIONS  
DESCRIPTION

BY  
DL  
DL  
DL

PREPARED FOR:

EDF RENEWABLE ENERGY

PROJECT SITE:

LONGBOAT SOLAR

DESCRIPTION:

SHEET INDEX  
SECTIONS 4, 5, T.9N., R.2W., S.B.B.&M.  
SECTION 33, T.10N., R.2W., S.B.B.&M.  
SAN BERNARDINO COUNTY

SHEET:

1  
OF 3  
JOB NO.: 85-077

# Appendices

**Appendix A:**  
**CalEEMod Emissions Modeling Program Output**

**Longboat Solar**  
**Mojave Desert AQMD Air District, Winter**

## 1.0 Project Characteristics

---

### 1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Industrial	234.47	User Defined Unit	234.47	0.00	0

### 1.2 Other Project Characteristics

<b>Urbanization</b>	Rural	<b>Wind Speed (m/s)</b>	2.6	<b>Precipitation Freq (Days)</b>	23
<b>Climate Zone</b>	10			<b>Operational Year</b>	2016
<b>Utility Company</b>	Southern California Edison				
<b>CO2 Intensity (lb/MWhr)</b>	630.89	<b>CH4 Intensity (lb/MWhr)</b>	0.029	<b>N2O Intensity (lb/MWhr)</b>	0.006

### 1.3 User Entered Comments & Non-Default Data

## Notes:

1. The same result as an annual analysis of emissions in tons/year instead of lb/day immediately follows this output.
2. The maximum daily emission rate reported herein is not the sum of all five construction phases. It reflects the scheduling inputted into the CalEEMod program. Only those phases occurring on any given construction day are summed.

Project Characteristics - Precipitation frequency changed to 23 events/year to account for data from the Barstow Fire Station weather observation site from the default 30 events/year for the air district.

Land Use - Based on a total disturbed area of 234.47 acres (the entire project area).

Construction Phase - Project phasing and duration taken from the CID Solar project, another of the Project Proponent's projects.

Off-road Equipment - Equipment fleet taken from the Catalina Solar 2 project, another of the Project Proponent's projects. Equipment horsepower and load factor figures are default.

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Off-road Equipment - Equipment fleet taken from the Catalina Solar 2 project, another of the Project Proponent's projects. Equipment horsepower and load factor figures are default.

Trips and VMT - Worker and Vendor trips are taken from the CID Solar project, another of the Project Proponent's projects. Hauling trips are adapted from the Duncan Road solar project, also in SB County.

Grading - Dust from material movement is assumed to be limited to grading, trenching, road compaction, and grubbing. It is estimated that the Clean-up and Restoration phase will be 25 percent of the area graded in Site Preparation.

Vehicle Trips - Operational mobile sources are the workers and vendors needed for regular maintenance of the Longboat project. Trip assumptions are the same as for the construction phase.

Energy Use -

Construction Off-road Equipment Mitigation - Mitigation level chosen to reduce NOx emissions below the threshold of significance.

Operational Off-Road Equipment - Assumptions based on the Catalina Solar 2 Project, another of the Project Proponent's projects.

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tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	17.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	38.00



tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	11.00
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tblConstructionPhase	NumDays	180.00	22.00
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tblConstructionPhase	PhaseEndDate	16-May-16	30-Apr-16
tblConstructionPhase	PhaseEndDate	15-Aug-16	31-Jul-16
tblConstructionPhase	PhaseEndDate	30-Oct-15	31-Oct-15
tblConstructionPhase	PhaseStartDate	01-May-16	01-Jan-16
tblConstructionPhase	PhaseStartDate	01-Nov-15	16-Oct-15
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tblGrading	AcresOfGrading	10.50	58.60
tblGrading	AcresOfGrading	33.00	234.47
tblLandUse	LotAcreage	0.00	234.47
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tblOffRoadEquipment	HorsePower	174.00	175.00
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tblOffRoadEquipment	UsageHours	7.00	8.00

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tblOperationalOffRoadEquipment	OperOffRoadEquipmentNumber	0.00	1.00
tblProjectCharacteristics	OperationalYear	2014	2016
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tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripLength	20.00	120.00
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tblTripsAndVMT	VendorTripLength	6.60	62.00
tblTripsAndVMT	VendorTripLength	6.60	62.00
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tblTripsAndVMT	WorkerTripLength	16.80	78.20

tblTripsAndVMT	WorkerTripLength	16.80	78.20
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tblVehicleTrips	PR_TP	0.00	100.00
tblVehicleTrips	WD_TR	0.00	0.02

## 2.0 Emissions Summary

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## 2.1 Overall Construction (Maximum Daily Emission)

### Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2015	22.8341	231.2098	136.0349	0.2304	27.4909	12.6916	40.1825	8.9436	11.7009	20.6445	0.0000	23,042.01 13	23,042.01 13	5.7026	0.0000	23,161.76 63
2016	27.5628	259.2529	180.3411	0.3640	10.4209	13.2080	23.6289	2.7740	12.1734	14.9473	0.0000	35,222.84 33	35,222.84 33	7.8451	0.0000	35,387.58 97
Total	50.3969	490.4627	316.3760	0.5944	37.9118	25.8996	63.8114	11.7176	23.8743	35.5918	0.0000	58,264.85 46	58,264.85 46	13.5477	0.0000	58,549.35 60

### Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2015	5.2986	88.0975	127.9671	0.2304	14.6502	3.5949	18.2451	4.6311	3.5865	8.2176	0.0000	23,042.01 12	23,042.01 12	5.7026	0.0000	23,161.76 63
2016	8.1243	125.6292	192.1274	0.3640	10.4209	5.0576	15.4785	2.7740	5.0374	7.8114	0.0000	35,222.84 33	35,222.84 33	7.8451	0.0000	35,387.58 97
<b>Total</b>	<b>13.4228</b>	<b>213.7267</b>	<b>320.0945</b>	<b>0.5944</b>	<b>25.0711</b>	<b>8.6525</b>	<b>33.7236</b>	<b>7.4051</b>	<b>8.6239</b>	<b>16.0290</b>	<b>0.0000</b>	<b>58,264.85 45</b>	<b>58,264.85 45</b>	<b>13.5477</b>	<b>0.0000</b>	<b>58,549.35 60</b>

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	73.37	56.42	-1.18	0.00	33.87	66.59	47.15	36.80	63.88	54.96	0.00	0.00	0.00	0.00	0.00	0.00

**2.2 Overall Operational****Unmitigated Operational**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	2.3900e-003	2.4000e-004	0.0246	0.0000		9.0000e-005	9.0000e-005		9.0000e-005	9.0000e-005		0.0513	0.0513	1.5000e-004		0.0544
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0836	0.5807	1.6504	3.9500e-003	0.2723	0.0109	0.2832	0.0727	9.9800e-003	0.0827		351.6844	351.6844	0.0132		351.9623
Offroad	2.1509	21.4937	10.9265	0.0203		1.2608	1.2608		1.1599	1.1599		2,110.4532	2,110.4532	0.6366		2,123.8216
<b>Total</b>	<b>2.2369</b>	<b>22.0746</b>	<b>12.6015</b>	<b>0.0243</b>	<b>0.2723</b>	<b>1.2718</b>	<b>1.5441</b>	<b>0.0727</b>	<b>1.1700</b>	<b>1.2427</b>		<b>2,462.1889</b>	<b>2,462.1889</b>	<b>0.6500</b>	<b>0.0000</b>	<b>2,475.8382</b>

## 2.2 Overall Operational

### Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	2.3900e-003	2.4000e-004	0.0246	0.0000		9.0000e-005	9.0000e-005		9.0000e-005	9.0000e-005		0.0513	0.0513	1.5000e-004		0.0544
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0836	0.5807	1.6504	3.9500e-003	0.2723	0.0109	0.2832	0.0727	9.9800e-003	0.0827		351.6844	351.6844	0.0132		351.9623
Offroad	2.1509	21.4937	10.9265	0.0203		1.2608	1.2608		1.1599	1.1599		2,110.4532	2,110.4532	0.6366		2,123.8216
<b>Total</b>	<b>2.2369</b>	<b>22.0746</b>	<b>12.6015</b>	<b>0.0243</b>	<b>0.2723</b>	<b>1.2718</b>	<b>1.5441</b>	<b>0.0727</b>	<b>1.1700</b>	<b>1.2427</b>		<b>2,462.1889</b>	<b>2,462.1889</b>	<b>0.6500</b>	<b>0.0000</b>	<b>2,475.8382</b>

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
<b>Percent Reduction</b>	<b>96.16</b>	<b>97.37</b>	<b>86.71</b>	<b>83.71</b>	<b>0.00</b>	<b>99.14</b>	<b>81.66</b>	<b>0.00</b>	<b>99.14</b>	<b>93.34</b>	<b>0.00</b>	<b>85.71</b>	<b>85.71</b>	<b>97.94</b>	<b>0.00</b>	<b>85.78</b>

## 3.0 Construction Detail

### Construction Phase



Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	10/1/2015	10/31/2015	5	22	
2	Underground Work	Grading	10/16/2015	4/30/2016	5	141	
3	System Installation	Building Construction	1/1/2016	6/15/2016	5	119	
4	Testing	Site Preparation	6/16/2016	7/15/2016	5	22	
5	Clean-up and Restoration	Grading	7/1/2016	7/31/2016	5	21	

**Acres of Grading (Site Preparation Phase): 234.47**

**Acres of Grading (Grading Phase): 0**

**Acres of Paving: 0**

**Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0 (Architectural Coating – sqft)**

#### OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Bore/Drill Rigs	1	8.00	205	0.50
Site Preparation	Cement and Mortar Mixers	1	8.00	9	0.56
Site Preparation	Excavators	2	8.00	175	0.38
Site Preparation	Generator Sets	5	8.00	7	0.74
Site Preparation	Graders	3	8.00	175	0.41
Site Preparation	Off-Highway Trucks	4	8.00	180	0.38
Site Preparation	Rollers	2	8.00	80	0.38
Site Preparation	Rubber Tired Dozers	2	8.00	250	0.40
Site Preparation	Skid Steer Loaders	1	8.00	64	0.37
Site Preparation	Tractors/Loaders/Backhoes	2	8.00	120	0.37
Underground Work	Concrete/Industrial Saws	0	8.00	81	0.73
Underground Work	Dumpers/Tenders	2	8.00	16	0.38
Underground Work	Excavators	0	8.00	162	0.38

Underground Work	Generator Sets	5	8.00	7	0.74
Underground Work	Graders	0	8.00	175	0.41
Underground Work	Off-Highway Trucks	4	8.00	180	0.38
Underground Work	Other Construction Equipment	4	8.00	120	0.42
Underground Work	Rollers	1	8.00	80	0.38
Underground Work	Rubber Tired Dozers	0	8.00	255	0.40
Underground Work	Rubber Tired Dozers	0	8.00	255	0.40
Underground Work	Scrapers	0	8.00	361	0.48
Underground Work	Tractors/Loaders/Backhoes	3	8.00	120	0.37
Underground Work	Trenchers	3	8.00	175	0.50
System Installation	Cranes	0	8.00	226	0.29
System Installation	Excavators	0	8.00	162	0.38
System Installation	Forklifts	4	8.00	75	0.20
System Installation	Generator Sets	5	8.00	7	0.74
System Installation	Graders	0	8.00	175	0.41
System Installation	Off-Highway Trucks	7	8.00	250	0.38
System Installation	Off-Highway Trucks	1	8.00	210	0.38
System Installation	Off-Highway Trucks	3	8.00	310	0.38
System Installation	Off-Highway Trucks	7	8.00	180	0.38
System Installation	Other Construction Equipment	4	8.00	30	0.42
System Installation	Other Construction Equipment	3	8.00	50	0.42
System Installation	Other General Industrial Equipment	1	8.00	87	0.34
System Installation	Rubber Tired Dozers	0	8.00	255	0.40
System Installation	Scrapers	0	8.00	361	0.48
System Installation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
System Installation	Welders	0	8.00	46	0.45
Testing	Cranes	0	8.00	226	0.29
Testing	Forklifts	0	8.00	89	0.20

Testing	Generator Sets	2	8.00	7	0.74
Testing	Off-Highway Trucks	5	8.00	310	0.38
Testing	Off-Highway Trucks	3	8.00	180	0.38
Testing	Rubber Tired Dozers	0	8.00	255	0.40
Testing	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Testing	Welders	0	8.00	46	0.45
Clean-up and Restoration	Excavators	0	8.00	162	0.38
Clean-up and Restoration	Graders	1	8.00	175	0.41
Clean-up and Restoration	Off-Highway Trucks	4	8.00	180	0.38
Clean-up and Restoration	Pavers	0	8.00	125	0.42
Clean-up and Restoration	Paving Equipment	0	8.00	130	0.36
Clean-up and Restoration	Rollers	0	8.00	80	0.38
Clean-up and Restoration	Rubber Tired Dozers	0	8.00	255	0.40
Clean-up and Restoration	Scrapers	0	8.00	361	0.48
Clean-up and Restoration	Tractors/Loaders/Backhoes	0	8.00	97	0.37

### Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	23	16.00	0.00	0.00	78.20	62.00	20.00	LD_Mix	HDT_Mix	HHDT
Underground Work	22	50.00	4.00	0.00	78.20	62.00	20.00	LD_Mix	HDT_Mix	HHDT
System Installation	35	115.00	7.00	5.00	78.20	62.00	120.00	LD_Mix	HDT_Mix	HHDT
Testing	10	30.00	0.00	0.00	78.20	62.00	20.00	LD_Mix	HDT_Mix	HHDT
Clean-up and Restoration	5	20.00	0.00	0.00	78.20	62.00	20.00	LD_Mix	HDT_Mix	HHDT

### 3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

Clean Paved Roads

### 3.2 Site Preparation - 2015

#### Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					23.3467	0.0000	23.3467	7.8409	0.0000	7.8409			0.0000			0.0000
Off-Road	11.4903	122.2969	56.8116	0.0990		6.4269	6.4269		5.9242	5.9242		10,249.2565	10,249.2565	3.0031		10,312.3216
<b>Total</b>	<b>11.4903</b>	<b>122.2969</b>	<b>56.8116</b>	<b>0.0990</b>	<b>23.3467</b>	<b>6.4269</b>	<b>29.7736</b>	<b>7.8409</b>	<b>5.9242</b>	<b>13.7651</b>		<b>10,249.2565</b>	<b>10,249.2565</b>	<b>3.0031</b>		<b>10,312.3216</b>

**3.2 Site Preparation - 2015****Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.2239	0.6780	5.8576	0.0103	0.9507	5.9900e-003	0.9567	0.2520	5.4500e-003	0.2575		875.9821	875.9821	0.0565		877.1678
<b>Total</b>	<b>0.2239</b>	<b>0.6780</b>	<b>5.8576</b>	<b>0.0103</b>	<b>0.9507</b>	<b>5.9900e-003</b>	<b>0.9567</b>	<b>0.2520</b>	<b>5.4500e-003</b>	<b>0.2575</b>		<b>875.9821</b>	<b>875.9821</b>	<b>0.0565</b>		<b>877.1678</b>

**Mitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					10.5060	0.0000	10.5060	3.5284	0.0000	3.5284			0.0000			0.0000
Off-Road	2.3231	45.5384	53.6948	0.0990		1.8961	1.8961		1.8961	1.8961	0.0000	10,249.2565	10,249.2565	3.0031		10,312.3216
<b>Total</b>	<b>2.3231</b>	<b>45.5384</b>	<b>53.6948</b>	<b>0.0990</b>	<b>10.5060</b>	<b>1.8961</b>	<b>12.4021</b>	<b>3.5284</b>	<b>1.8961</b>	<b>5.4245</b>	<b>0.0000</b>	<b>10,249.2565</b>	<b>10,249.2565</b>	<b>3.0031</b>		<b>10,312.3216</b>

### 3.2 Site Preparation - 2015

#### Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.2239	0.6780	5.8576	0.0103	0.9507	5.9900e-003	0.9567	0.2520	5.4500e-003	0.2575		875.9821	875.9821	0.0565		877.1678
<b>Total</b>	<b>0.2239</b>	<b>0.6780</b>	<b>5.8576</b>	<b>0.0103</b>	<b>0.9507</b>	<b>5.9900e-003</b>	<b>0.9567</b>	<b>0.2520</b>	<b>5.4500e-003</b>	<b>0.2575</b>		<b>875.9821</b>	<b>875.9821</b>	<b>0.0565</b>		<b>877.1678</b>

### 3.3 Underground Work - 2015

#### Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	10.2759	103.4582	53.3663	0.0823		6.1622	6.1622		5.6827	5.6827		8,483.6095	8,483.6095	2.4627		8,535.3268
<b>Total</b>	<b>10.2759</b>	<b>103.4582</b>	<b>53.3663</b>	<b>0.0823</b>	<b>0.0000</b>	<b>6.1622</b>	<b>6.1622</b>	<b>0.0000</b>	<b>5.6827</b>	<b>5.6827</b>		<b>8,483.6095</b>	<b>8,483.6095</b>	<b>2.4627</b>		<b>8,535.3268</b>

**3.3 Underground Work - 2015****Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1446	2.6582	1.6942	6.8500e-003	0.2225	0.0777	0.3002	0.0631	0.0715	0.1345		695.7191	695.7191	3.8900e-003		695.8008
Worker	0.6995	2.1186	18.3051	0.0320	2.9710	0.0187	2.9897	0.7876	0.0171	0.8047		2,737.4440	2,737.4440	0.1765		2,741.1494
<b>Total</b>	<b>0.8441</b>	<b>4.7768</b>	<b>19.9994</b>	<b>0.0389</b>	<b>3.1935</b>	<b>0.0964</b>	<b>3.2899</b>	<b>0.8507</b>	<b>0.0885</b>	<b>0.9392</b>		<b>3,433.1632</b>	<b>3,433.1632</b>	<b>0.1803</b>		<b>3,436.9502</b>

**Mitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	1.9076	37.1044	48.4153	0.0823		1.5963	1.5963		1.5963	1.5963	0.0000	8,483.6095	8,483.6095	2.4627		8,535.3267
<b>Total</b>	<b>1.9076</b>	<b>37.1044</b>	<b>48.4153</b>	<b>0.0823</b>	<b>0.0000</b>	<b>1.5963</b>	<b>1.5963</b>	<b>0.0000</b>	<b>1.5963</b>	<b>1.5963</b>	<b>0.0000</b>	<b>8,483.6095</b>	<b>8,483.6095</b>	<b>2.4627</b>		<b>8,535.3267</b>

**3.3 Underground Work - 2015****Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1446	2.6582	1.6942	6.8500e-003	0.2225	0.0777	0.3002	0.0631	0.0715	0.1345		695.7191	695.7191	3.8900e-003		695.8008
Worker	0.6995	2.1186	18.3051	0.0320	2.9710	0.0187	2.9897	0.7876	0.0171	0.8047		2,737.4440	2,737.4440	0.1765		2,741.1494
<b>Total</b>	<b>0.8441</b>	<b>4.7768</b>	<b>19.9994</b>	<b>0.0389</b>	<b>3.1935</b>	<b>0.0964</b>	<b>3.2899</b>	<b>0.8507</b>	<b>0.0885</b>	<b>0.9392</b>		<b>3,433.1632</b>	<b>3,433.1632</b>	<b>0.1803</b>		<b>3,436.9502</b>

**3.3 Underground Work - 2016****Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	9.4263	94.2938	52.0608	0.0823		5.5997	5.5997		5.1644	5.1644		8,399.8314	8,399.8314	2.4616		8,451.5251
<b>Total</b>	<b>9.4263</b>	<b>94.2938</b>	<b>52.0608</b>	<b>0.0823</b>	<b>0.0000</b>	<b>5.5997</b>	<b>5.5997</b>	<b>0.0000</b>	<b>5.1644</b>	<b>5.1644</b>		<b>8,399.8314</b>	<b>8,399.8314</b>	<b>2.4616</b>		<b>8,451.5251</b>



### 3.3 Underground Work - 2016

#### Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1254	2.2590	1.5256	6.8400e-003	0.2226	0.0685	0.2911	0.0631	0.0630	0.1261		687.5502	687.5502	3.4200e-003		687.6219
Worker	0.5912	1.8929	16.2345	0.0320	2.9710	0.0177	2.9886	0.7876	0.0162	0.8038		2,636.8527	2,636.8527	0.1613		2,640.2391
<b>Total</b>	<b>0.7166</b>	<b>4.1518</b>	<b>17.7600</b>	<b>0.0389</b>	<b>3.1936</b>	<b>0.0862</b>	<b>3.2798</b>	<b>0.8508</b>	<b>0.0792</b>	<b>0.9299</b>		<b>3,324.4029</b>	<b>3,324.4029</b>	<b>0.1647</b>		<b>3,327.8610</b>

#### Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	1.9076	37.1044	48.4153	0.0823		1.5963	1.5963		1.5963	1.5963	0.0000	8,399.8313	8,399.8313	2.4616		8,451.5251
<b>Total</b>	<b>1.9076</b>	<b>37.1044</b>	<b>48.4153</b>	<b>0.0823</b>	<b>0.0000</b>	<b>1.5963</b>	<b>1.5963</b>	<b>0.0000</b>	<b>1.5963</b>	<b>1.5963</b>	<b>0.0000</b>	<b>8,399.8313</b>	<b>8,399.8313</b>	<b>2.4616</b>		<b>8,451.5251</b>

### 3.3 Underground Work - 2016

#### Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1254	2.2590	1.5256	6.8400e-003	0.2226	0.0685	0.2911	0.0631	0.0630	0.1261		687.5502	687.5502	3.4200e-003		687.6219
Worker	0.5912	1.8929	16.2345	0.0320	2.9710	0.0177	2.9886	0.7876	0.0162	0.8038		2,636.8527	2,636.8527	0.1613		2,640.2391
<b>Total</b>	<b>0.7166</b>	<b>4.1518</b>	<b>17.7600</b>	<b>0.0389</b>	<b>3.1936</b>	<b>0.0862</b>	<b>3.2798</b>	<b>0.8508</b>	<b>0.0792</b>	<b>0.9299</b>		<b>3,324.4029</b>	<b>3,324.4029</b>	<b>0.1647</b>		<b>3,327.8610</b>

### 3.4 System Installation - 2016

#### Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	15.8381	152.4508	70.4848	0.1571		7.3603	7.3603		6.7811	6.7811		16,213.0903	16,213.0903	4.8418		16,314.7688
<b>Total</b>	<b>15.8381</b>	<b>152.4508</b>	<b>70.4848</b>	<b>0.1571</b>		<b>7.3603</b>	<b>7.3603</b>		<b>6.7811</b>	<b>6.7811</b>		<b>16,213.0903</b>	<b>16,213.0903</b>	<b>4.8418</b>		<b>16,314.7688</b>

**3.4 System Installation - 2016****Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	2.4600e-003	0.0497	0.0266	1.7000e-004	4.4100e-003	1.4800e-003	5.9000e-003	1.2100e-003	1.3600e-003	2.5700e-003		17.5448	17.5448	9.0000e-005		17.5467
Vendor	0.2195	3.9532	2.6697	0.0120	0.3896	0.1199	0.5095	0.1104	0.1103	0.2207		1,203.2129	1,203.2129	5.9800e-003		1,203.3384
Worker	1.3598	4.3536	37.3392	0.0736	6.8332	0.0406	6.8738	1.8116	0.0371	1.8487		6,064.7611	6,064.7611	0.3709		6,072.5498
<b>Total</b>	<b>1.5817</b>	<b>8.3565</b>	<b>40.0356</b>	<b>0.0858</b>	<b>7.2273</b>	<b>0.1620</b>	<b>7.3892</b>	<b>1.9232</b>	<b>0.1488</b>	<b>2.0720</b>		<b>7,285.5188</b>	<b>7,285.5188</b>	<b>0.3770</b>		<b>7,293.4348</b>

**Mitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.9183	76.0165	85.9165	0.1571		3.2132	3.2132		3.2132	3.2132	0.0000	16,213.0903	16,213.0903	4.8418		16,314.7688
<b>Total</b>	<b>3.9183</b>	<b>76.0165</b>	<b>85.9165</b>	<b>0.1571</b>		<b>3.2132</b>	<b>3.2132</b>		<b>3.2132</b>	<b>3.2132</b>	<b>0.0000</b>	<b>16,213.0903</b>	<b>16,213.0903</b>	<b>4.8418</b>		<b>16,314.7688</b>

### 3.4 System Installation - 2016

#### Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	2.4600e-003	0.0497	0.0266	1.7000e-004	4.4100e-003	1.4800e-003	5.9000e-003	1.2100e-003	1.3600e-003	2.5700e-003		17.5448	17.5448	9.0000e-005		17.5467
Vendor	0.2195	3.9532	2.6697	0.0120	0.3896	0.1199	0.5095	0.1104	0.1103	0.2207		1,203.2129	1,203.2129	5.9800e-003		1,203.3384
Worker	1.3598	4.3536	37.3392	0.0736	6.8332	0.0406	6.8738	1.8116	0.0371	1.8487		6,064.7611	6,064.7611	0.3709		6,072.5498
<b>Total</b>	<b>1.5817</b>	<b>8.3565</b>	<b>40.0356</b>	<b>0.0858</b>	<b>7.2273</b>	<b>0.1620</b>	<b>7.3892</b>	<b>1.9232</b>	<b>0.1488</b>	<b>2.0720</b>		<b>7,285.5188</b>	<b>7,285.5188</b>	<b>0.3770</b>		<b>7,293.4348</b>

### 3.5 Testing - 2016

#### Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	5.3948	60.4283	26.8464	0.0700		2.3865	2.3865		2.1995	2.1995		7,218.8665	7,218.8665	2.1580		7,264.1850
<b>Total</b>	<b>5.3948</b>	<b>60.4283</b>	<b>26.8464</b>	<b>0.0700</b>	<b>0.0000</b>	<b>2.3865</b>	<b>2.3865</b>	<b>0.0000</b>	<b>2.1995</b>	<b>2.1995</b>		<b>7,218.8665</b>	<b>7,218.8665</b>	<b>2.1580</b>		<b>7,264.1850</b>

**3.5 Testing - 2016****Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.3547	1.1357	9.7407	0.0192	1.7826	0.0106	1.7932	0.4726	9.6900e-003	0.4823		1,582.1116	1,582.1116	0.0968		1,584.1434
<b>Total</b>	<b>0.3547</b>	<b>1.1357</b>	<b>9.7407</b>	<b>0.0192</b>	<b>1.7826</b>	<b>0.0106</b>	<b>1.7932</b>	<b>0.4726</b>	<b>9.6900e-003</b>	<b>0.4823</b>		<b>1,582.1116</b>	<b>1,582.1116</b>	<b>0.0968</b>		<b>1,584.1434</b>

**Mitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	1.6809	32.4969	36.4190	0.0700		1.2326	1.2326		1.2326	1.2326	0.0000	7,218.8665	7,218.8665	2.1580		7,264.1850
<b>Total</b>	<b>1.6809</b>	<b>32.4969</b>	<b>36.4190</b>	<b>0.0700</b>	<b>0.0000</b>	<b>1.2326</b>	<b>1.2326</b>	<b>0.0000</b>	<b>1.2326</b>	<b>1.2326</b>	<b>0.0000</b>	<b>7,218.8665</b>	<b>7,218.8665</b>	<b>2.1580</b>		<b>7,264.1850</b>

### 3.5 Testing - 2016

#### Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.3547	1.1357	9.7407	0.0192	1.7826	0.0106	1.7932	0.4726	9.6900e-003	0.4823		1,582.1116	1,582.1116	0.0968		1,584.1434
<b>Total</b>	<b>0.3547</b>	<b>1.1357</b>	<b>9.7407</b>	<b>0.0192</b>	<b>1.7826</b>	<b>0.0106</b>	<b>1.7932</b>	<b>0.4726</b>	<b>9.6900e-003</b>	<b>0.4823</b>		<b>1,582.1116</b>	<b>1,582.1116</b>	<b>0.0968</b>		<b>1,584.1434</b>

### 3.6 Clean-up and Restoration - 2016

#### Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					2.9593	0.0000	2.9593	0.3195	0.0000	0.3195			0.0000			0.0000
Off-Road	3.1756	33.7295	13.7564	0.0296		1.5889	1.5889		1.4618	1.4618		3,077.8123	3,077.8123	0.9284		3,097.3082
<b>Total</b>	<b>3.1756</b>	<b>33.7295</b>	<b>13.7564</b>	<b>0.0296</b>	<b>2.9593</b>	<b>1.5889</b>	<b>4.5482</b>	<b>0.3195</b>	<b>1.4618</b>	<b>1.7813</b>		<b>3,077.8123</b>	<b>3,077.8123</b>	<b>0.9284</b>		<b>3,097.3082</b>

### 3.6 Clean-up and Restoration - 2016

#### Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.2365	0.7572	6.4938	0.0128	1.1884	7.0600e-003	1.1955	0.3151	6.4600e-003	0.3215		1,054.741 1	1,054.741 1	0.0645		1,056.095 6
<b>Total</b>	<b>0.2365</b>	<b>0.7572</b>	<b>6.4938</b>	<b>0.0128</b>	<b>1.1884</b>	<b>7.0600e-003</b>	<b>1.1955</b>	<b>0.3151</b>	<b>6.4600e-003</b>	<b>0.3215</b>		<b>1,054.741 1</b>	<b>1,054.741 1</b>	<b>0.0645</b>		<b>1,056.095 6</b>

#### Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					1.3317	0.0000	1.3317	0.1438	0.0000	0.1438			0.0000			0.0000
Off-Road	0.7309	14.1310	15.8364	0.0296		0.5360	0.5360		0.5360	0.5360	0.0000	3,077.812 3	3,077.812 3	0.9284		3,097.308 2
<b>Total</b>	<b>0.7309</b>	<b>14.1310</b>	<b>15.8364</b>	<b>0.0296</b>	<b>1.3317</b>	<b>0.5360</b>	<b>1.8677</b>	<b>0.1438</b>	<b>0.5360</b>	<b>0.6798</b>	<b>0.0000</b>	<b>3,077.812 3</b>	<b>3,077.812 3</b>	<b>0.9284</b>		<b>3,097.308 2</b>

### 3.6 Clean-up and Restoration - 2016

#### Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.2365	0.7572	6.4938	0.0128	1.1884	7.0600e-003	1.1955	0.3151	6.4600e-003	0.3215		1,054.7411	1,054.7411	0.0645		1,056.0956
<b>Total</b>	<b>0.2365</b>	<b>0.7572</b>	<b>6.4938</b>	<b>0.0128</b>	<b>1.1884</b>	<b>7.0600e-003</b>	<b>1.1955</b>	<b>0.3151</b>	<b>6.4600e-003</b>	<b>0.3215</b>		<b>1,054.7411</b>	<b>1,054.7411</b>	<b>0.0645</b>		<b>1,056.0956</b>

### 4.0 Operational Detail - Mobile

#### 4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0836	0.5807	1.6504	3.9500e-003	0.2723	0.0109	0.2832	0.0727	9.9800e-003	0.0827		351.6844	351.6844	0.0132		351.9623
Unmitigated	0.0836	0.5807	1.6504	3.9500e-003	0.2723	0.0109	0.2832	0.0727	9.9800e-003	0.0827		351.6844	351.6844	0.0132		351.9623



## 4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
User Defined Industrial	4.69	0.00	0.00	91,395	91,395
Total	4.69	0.00	0.00	91,395	91,395

## 4.3 Trip Type Information

Land Use	Miles			Trip %			Trip Purpose %		
	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
User Defined Industrial	78.20	6.60	62.00	80.00	0.00	20.00	100	0	0

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.448800	0.067422	0.174832	0.157112	0.043057	0.007351	0.008222	0.079046	0.001032	0.001383	0.007979	0.000545	0.003219

## 5.0 Energy Detail

### 4.4 Fleet Mix

Historical Energy Use: N

## 5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

## 5.2 Energy by Land Use - NaturalGas

### Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
<b>Total</b>		<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>		<b>0.0000</b>	<b>0.0000</b>		<b>0.0000</b>	<b>0.0000</b>		<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>

### Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
<b>Total</b>		<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>		<b>0.0000</b>	<b>0.0000</b>		<b>0.0000</b>	<b>0.0000</b>		<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>

## 6.0 Area Detail

### 6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	2.3900e-003	2.4000e-004	0.0246	0.0000		9.0000e-005	9.0000e-005		9.0000e-005	9.0000e-005		0.0513	0.0513	1.5000e-004		0.0544
Unmitigated	2.3900e-003	2.4000e-004	0.0246	0.0000		9.0000e-005	9.0000e-005		9.0000e-005	9.0000e-005		0.0513	0.0513	1.5000e-004		0.0544

## 6.2 Area by SubCategory

### Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	2.3900e-003	2.4000e-004	0.0246	0.0000		9.0000e-005	9.0000e-005		9.0000e-005	9.0000e-005		0.0513	0.0513	1.5000e-004		0.0544
<b>Total</b>	<b>2.3900e-003</b>	<b>2.4000e-004</b>	<b>0.0246</b>	<b>0.0000</b>		<b>9.0000e-005</b>	<b>9.0000e-005</b>		<b>9.0000e-005</b>	<b>9.0000e-005</b>		<b>0.0513</b>	<b>0.0513</b>	<b>1.5000e-004</b>		<b>0.0544</b>

## 6.2 Area by SubCategory

### Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	2.3900e-003	2.4000e-004	0.0246	0.0000		9.0000e-005	9.0000e-005		9.0000e-005	9.0000e-005		0.0513	0.0513	1.5000e-004		0.0544
<b>Total</b>	<b>2.3900e-003</b>	<b>2.4000e-004</b>	<b>0.0246</b>	<b>0.0000</b>		<b>9.0000e-005</b>	<b>9.0000e-005</b>		<b>9.0000e-005</b>	<b>9.0000e-005</b>		<b>0.0513</b>	<b>0.0513</b>	<b>1.5000e-004</b>		<b>0.0544</b>

## 7.0 Water Detail

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### 7.1 Mitigation Measures Water

## 8.0 Waste Detail

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### 8.1 Mitigation Measures Waste

## 9.0 Operational Offroad

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Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type
Forklifts	1	8.00	80	75	0.20	Diesel
Off-Highway Trucks	1	8.00	80	210	0.38	Diesel
Off-Highway Trucks	1	8.00	80	180	0.38	Diesel
Other General Industrial Equipment	1	8.00	80	87	0.34	Diesel
Tractors/Loaders/Backhoes	1	8.00	80	120	0.37	Diesel

**UnMitigated/Mitigated**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Equipment Type	lb/day										lb/day					
Off-Highway Trucks	1.1651	12.6154	4.7670	0.0126		0.5430	0.5430		0.4996	0.4996		1,313.3646	1,313.3646	0.3962		1,321.6839
Other General Industrial Equipment	0.3733	3.2054	2.1105	2.5300e-003		0.2701	0.2701		0.2485	0.2485		262.9087	262.9087	0.0793		264.5740
Tractors/Loaders/Backhoes	0.4213	4.0269	2.9847	3.8500e-003		0.3100	0.3100		0.2852	0.2852		400.4255	400.4255	0.1208		402.9619
Forklifts	0.1912	1.6460	1.0643	1.2900e-003		0.1376	0.1376		0.1266	0.1266		133.7545	133.7545	0.0404		134.6017
<b>Total</b>	<b>2.1509</b>	<b>21.4937</b>	<b>10.9265</b>	<b>0.0203</b>		<b>1.2608</b>	<b>1.2608</b>		<b>1.1599</b>	<b>1.1599</b>		<b>2,110.4532</b>	<b>2,110.4532</b>	<b>0.6366</b>		<b>2,123.8216</b>

**10.0 Vegetation**

**Longboat Solar**  
**Mojave Desert AQMD Air District, Annual**

**1.0 Project Characteristics**

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**1.1 Land Usage**

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Industrial	234.47	User Defined Unit	234.47	0.00	0

**1.2 Other Project Characteristics**

<b>Urbanization</b>	Rural	<b>Wind Speed (m/s)</b>	2.6	<b>Precipitation Freq (Days)</b>	23
<b>Climate Zone</b>	10			<b>Operational Year</b>	2016
<b>Utility Company</b>	Southern California Edison				
<b>CO2 Intensity (lb/MWhr)</b>	630.89	<b>CH4 Intensity (lb/MWhr)</b>	0.029	<b>N2O Intensity (lb/MWhr)</b>	0.006

**1.3 User Entered Comments & Non-Default Data**

Project Characteristics - Precipitation frequency changed to 23 events/year to account for data from the Barstow Fire Station weather observation site from the default 30 events/year for the air district.

Land Use - Based on a total disturbed area of 234.47 acres (the entire project area).

Construction Phase - Project phasing and duration taken from the CID Solar project, another of the Project Proponent's projects.

Off-road Equipment - Equipment fleet taken from the Catalina Solar 2 project, another of the Project Proponent's projects. Equipment horsepower and load factor figures are default.

Off-road Equipment - Equipment fleet taken from the Catalina Solar 2 project, another of the Project Proponent's projects. Equipment horsepower and load factor figures are default.

Off-road Equipment - Equipment fleet taken from the Catalina Solar 2 project, another of the Project Proponent's projects. Equipment horsepower and load factor figures are default.

Off-road Equipment - Equipment fleet taken from the Catalina Solar 2 project, another of the Project Proponent's projects. Equipment horsepower and load factor figures are default.

Off-road Equipment - Equipment fleet taken from the Catalina Solar 2 project, another of the Project Proponent's projects. Equipment horsepower and load factor figures are default.

Trips and VMT - Worker and Vendor trips are taken from the CID Solar project, another of the Project Proponent's projects. Hauling trips are adapted from the Duncan Road solar project, also in SB County.

Grading - Dust from material movement is assumed to be limited to grading, trenching, road compaction, and grubbing. It is estimated that the Clean-up and Restoration phase will be 25 percent of the area graded in Site Preparation.

Vehicle Trips - Operational mobile sources are the workers and vendors needed for regular maintenance of the Longboat project. Trip assumptions are the same as for the construction phase.

Energy Use -

Construction Off-road Equipment Mitigation - Mitigation level chosen to reduce NOx emissions below the threshold of significance.

Operational Off-Road Equipment - Assumptions based on the Catalina Solar 2 Project, another of the Project Proponent's projects.

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	17.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	38.00

tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	11.00
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tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
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tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	4,650.00	119.00
tblConstructionPhase	NumDays	465.00	141.00
tblConstructionPhase	NumDays	465.00	21.00
tblConstructionPhase	NumDays	180.00	22.00
tblConstructionPhase	NumDays	180.00	22.00
tblConstructionPhase	PhaseEndDate	13-Oct-16	15-Jun-16



tblConstructionPhase	PhaseEndDate	16-May-16	30-Apr-16
tblConstructionPhase	PhaseEndDate	15-Aug-16	31-Jul-16
tblConstructionPhase	PhaseEndDate	30-Oct-15	31-Oct-15
tblConstructionPhase	PhaseStartDate	01-May-16	01-Jan-16
tblConstructionPhase	PhaseStartDate	01-Nov-15	16-Oct-15
tblConstructionPhase	PhaseStartDate	16-Jul-16	01-Jul-16
tblGrading	AcresOfGrading	10.50	58.60
tblGrading	AcresOfGrading	33.00	234.47
tblLandUse	LotAcreage	0.00	234.47
tblOffRoadEquipment	HorsePower	89.00	75.00
tblOffRoadEquipment	HorsePower	84.00	7.00
tblOffRoadEquipment	HorsePower	174.00	175.00
tblOffRoadEquipment	HorsePower	174.00	175.00
tblOffRoadEquipment	HorsePower	255.00	250.00
tblOffRoadEquipment	HorsePower	97.00	120.00
tblOffRoadEquipment	HorsePower	97.00	120.00
tblOffRoadEquipment	HorsePower	162.00	175.00
tblOffRoadEquipment	HorsePower	84.00	7.00
tblOffRoadEquipment	HorsePower	84.00	7.00
tblOffRoadEquipment	HorsePower	84.00	7.00
tblOffRoadEquipment	HorsePower	174.00	175.00
tblOffRoadEquipment	HorsePower	174.00	175.00
tblOffRoadEquipment	HorsePower	400.00	310.00
tblOffRoadEquipment	HorsePower	400.00	180.00
tblOffRoadEquipment	HorsePower	400.00	180.00
tblOffRoadEquipment	HorsePower	400.00	180.00
tblOffRoadEquipment	HorsePower	400.00	250.00
tblOffRoadEquipment	HorsePower	400.00	210.00

tblOffRoadEquipment	HorsePower	400.00	310.00
tblOffRoadEquipment	HorsePower	400.00	180.00
tblOffRoadEquipment	HorsePower	400.00	180.00
tblOffRoadEquipment	HorsePower	171.00	120.00
tblOffRoadEquipment	HorsePower	171.00	30.00
tblOffRoadEquipment	HorsePower	171.00	50.00
tblOffRoadEquipment	HorsePower	80.00	175.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	5.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00

tblOperationalOffRoadEquipment	OperDaysPerYear	260.00	80.00
tblOperationalOffRoadEquipment	OperDaysPerYear	260.00	80.00
tblOperationalOffRoadEquipment	OperDaysPerYear	260.00	80.00
tblOperationalOffRoadEquipment	OperDaysPerYear	260.00	80.00
tblOperationalOffRoadEquipment	OperDaysPerYear	260.00	80.00
tblOperationalOffRoadEquipment	OperHorsePower	89.00	75.00
tblOperationalOffRoadEquipment	OperHorsePower	400.00	210.00
tblOperationalOffRoadEquipment	OperHorsePower	400.00	180.00
tblOperationalOffRoadEquipment	OperHorsePower	97.00	120.00
tblOperationalOffRoadEquipment	OperOffRoadEquipmentNumber	0.00	1.00
tblOperationalOffRoadEquipment	OperOffRoadEquipmentNumber	0.00	1.00
tblOperationalOffRoadEquipment	OperOffRoadEquipmentNumber	0.00	1.00
tblOperationalOffRoadEquipment	OperOffRoadEquipmentNumber	0.00	1.00
tblOperationalOffRoadEquipment	OperOffRoadEquipmentNumber	0.00	1.00
tblProjectCharacteristics	OperationalYear	2014	2016
tblProjectCharacteristics	PrecipitationFrequency	30	23
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripLength	20.00	120.00
tblTripsAndVMT	HaulingTripNumber	0.00	5.00
tblTripsAndVMT	VendorTripLength	6.60	62.00
tblTripsAndVMT	VendorTripLength	6.60	62.00
tblTripsAndVMT	VendorTripLength	6.60	62.00
tblTripsAndVMT	VendorTripLength	6.60	62.00
tblTripsAndVMT	VendorTripLength	6.60	62.00
tblTripsAndVMT	VendorTripNumber	0.00	4.00
tblTripsAndVMT	VendorTripNumber	0.00	7.00
tblTripsAndVMT	WorkerTripLength	16.80	78.20
tblTripsAndVMT	WorkerTripLength	16.80	78.20

tblTripsAndVMT	WorkerTripLength	16.80	78.20
tblTripsAndVMT	WorkerTripLength	16.80	78.20
tblTripsAndVMT	WorkerTripLength	16.80	78.20
tblTripsAndVMT	WorkerTripNumber	25.00	30.00
tblTripsAndVMT	WorkerTripNumber	55.00	50.00
tblTripsAndVMT	WorkerTripNumber	58.00	16.00
tblTripsAndVMT	WorkerTripNumber	0.00	115.00
tblTripsAndVMT	WorkerTripNumber	13.00	20.00
tblVehicleTrips	CNW_TL	6.60	62.00
tblVehicleTrips	CNW_TTP	0.00	20.00
tblVehicleTrips	CW_TL	14.70	78.20
tblVehicleTrips	CW_TTP	0.00	80.00
tblVehicleTrips	PR_TP	0.00	100.00
tblVehicleTrips	WD_TR	0.00	0.02

## 2.0 Emissions Summary

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## 2.1 Overall Construction

### Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2015	0.4356	4.3324	2.7608	4.5700e-003	0.3538	0.2429	0.5966	0.1121	0.2239	0.3360	0.0000	411.4352	411.4352	0.0965	0.0000	413.4611
2016	1.5768	14.8581	10.4881	0.0213	0.6224	0.7352	1.3575	0.1609	0.6775	0.8384	0.0000	1,871.4408	1,871.4408	0.4161	0.0000	1,880.1790
<b>Total</b>	<b>2.0124</b>	<b>19.1905</b>	<b>13.2490</b>	<b>0.0259</b>	<b>0.9761</b>	<b>0.9781</b>	<b>1.9542</b>	<b>0.2730</b>	<b>0.9014</b>	<b>1.1744</b>	<b>0.0000</b>	<b>2,282.8761</b>	<b>2,282.8761</b>	<b>0.5126</b>	<b>0.0000</b>	<b>2,293.6401</b>

### Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2015	0.1047	1.6633	2.5904	4.5700e-003	0.2125	0.0675	0.2800	0.0647	0.0673	0.1319	0.0000	411.4349	411.4349	0.0965	0.0000	413.4607
2016	0.4778	7.3381	11.3767	0.0213	0.6053	0.2925	0.8978	0.1590	0.2914	0.4505	0.0000	1,871.4393	1,871.4393	0.4161	0.0000	1,880.1774
Total	0.5824	9.0014	13.9671	0.0259	0.8178	0.3600	1.1778	0.2237	0.3587	0.5824	0.0000	2,282.8741	2,282.8741	0.5126	0.0000	2,293.6381

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	71.06	53.09	-5.42	0.00	16.22	63.19	39.73	18.06	60.21	50.41	0.00	0.00	0.00	0.00	0.00	0.00

**2.2 Overall Operational****Unmitigated Operational**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	2.2000e-004	2.0000e-005	2.2100e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	4.1900e-003	4.1900e-003	1.0000e-005	0.0000	4.4400e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0111	0.0766	0.2305	5.3000e-004	0.0349	1.4100e-003	0.0363	9.3400e-003	1.3000e-003	0.0106	0.0000	42.4860	42.4860	1.5600e-003	0.0000	42.5187
Offroad	0.0860	0.8598	0.4371	8.1000e-004		0.0504	0.0504		0.0464	0.0464	0.0000	76.5828	76.5828	0.0231	0.0000	77.0679
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
<b>Total</b>	<b>0.0974</b>	<b>0.9364</b>	<b>0.6698</b>	<b>1.3400e-003</b>	<b>0.0349</b>	<b>0.0519</b>	<b>0.0868</b>	<b>9.3400e-003</b>	<b>0.0477</b>	<b>0.0570</b>	<b>0.0000</b>	<b>119.0730</b>	<b>119.0730</b>	<b>0.0247</b>	<b>0.0000</b>	<b>119.5911</b>

## 2.2 Overall Operational

### Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	2.2000e-004	2.0000e-005	2.2100e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	4.1900e-003	4.1900e-003	1.0000e-005	0.0000	4.4400e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0111	0.0766	0.2305	5.3000e-004	0.0349	1.4100e-003	0.0363	9.3400e-003	1.3000e-003	0.0106	0.0000	42.4860	42.4860	1.5600e-003	0.0000	42.5187
Offroad	0.0860	0.8598	0.4371	8.1000e-004		0.0504	0.0504		0.0464	0.0464	0.0000	76.5828	76.5828	0.0231	0.0000	77.0679
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
<b>Total</b>	<b>0.0974</b>	<b>0.9364</b>	<b>0.6698</b>	<b>1.3400e-003</b>	<b>0.0349</b>	<b>0.0519</b>	<b>0.0868</b>	<b>9.3400e-003</b>	<b>0.0477</b>	<b>0.0570</b>	<b>0.0000</b>	<b>119.0730</b>	<b>119.0730</b>	<b>0.0247</b>	<b>0.0000</b>	<b>119.5911</b>

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
<b>Percent Reduction</b>	<b>88.34</b>	<b>91.82</b>	<b>65.25</b>	<b>60.45</b>	<b>0.00</b>	<b>97.26</b>	<b>58.12</b>	<b>0.00</b>	<b>97.25</b>	<b>81.35</b>	<b>0.00</b>	<b>64.32</b>	<b>64.32</b>	<b>93.64</b>	<b>0.00</b>	<b>64.44</b>

## 3.0 Construction Detail

### Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	10/1/2015	10/31/2015	5	22	
2	Underground Work	Grading	10/16/2015	4/30/2016	5	141	
3	System Installation	Building Construction	1/1/2016	6/15/2016	5	119	
4	Testing	Site Preparation	6/16/2016	7/15/2016	5	22	
5	Clean-up and Restoration	Grading	7/1/2016	7/31/2016	5	21	

**Acres of Grading (Site Preparation Phase): 234.47**

**Acres of Grading (Grading Phase): 0**

**Acres of Paving: 0**

**Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0 (Architectural Coating – sqft)**

#### OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Bore/Drill Rigs	1	8.00	205	0.50
Site Preparation	Cement and Mortar Mixers	1	8.00	9	0.56
Site Preparation	Excavators	2	8.00	175	0.38
Site Preparation	Generator Sets	5	8.00	7	0.74
Site Preparation	Graders	3	8.00	175	0.41
Site Preparation	Off-Highway Trucks	4	8.00	180	0.38
Site Preparation	Rollers	2	8.00	80	0.38
Site Preparation	Rubber Tired Dozers	2	8.00	250	0.40
Site Preparation	Skid Steer Loaders	1	8.00	64	0.37
Site Preparation	Tractors/Loaders/Backhoes	2	8.00	120	0.37
Underground Work	Concrete/Industrial Saws	0	8.00	81	0.73
Underground Work	Dumpers/Tenders	2	8.00	16	0.38
Underground Work	Excavators	0	8.00	162	0.38



Underground Work	Generator Sets	5	8.00	7	0.74
Underground Work	Graders	0	8.00	175	0.41
Underground Work	Off-Highway Trucks	4	8.00	180	0.38
Underground Work	Other Construction Equipment	4	8.00	120	0.42
Underground Work	Rollers	1	8.00	80	0.38
Underground Work	Rubber Tired Dozers	0	8.00	255	0.40
Underground Work	Rubber Tired Dozers	0	8.00	255	0.40
Underground Work	Scrapers	0	8.00	361	0.48
Underground Work	Tractors/Loaders/Backhoes	3	8.00	120	0.37
Underground Work	Trenchers	3	8.00	175	0.50
System Installation	Cranes	0	8.00	226	0.29
System Installation	Excavators	0	8.00	162	0.38
System Installation	Forklifts	4	8.00	75	0.20
System Installation	Generator Sets	5	8.00	7	0.74
System Installation	Graders	0	8.00	175	0.41
System Installation	Off-Highway Trucks	7	8.00	250	0.38
System Installation	Off-Highway Trucks	1	8.00	210	0.38
System Installation	Off-Highway Trucks	3	8.00	310	0.38
System Installation	Off-Highway Trucks	7	8.00	180	0.38
System Installation	Other Construction Equipment	4	8.00	30	0.42
System Installation	Other Construction Equipment	3	8.00	50	0.42
System Installation	Other General Industrial Equipment	1	8.00	87	0.34
System Installation	Rubber Tired Dozers	0	8.00	255	0.40
System Installation	Scrapers	0	8.00	361	0.48
System Installation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
System Installation	Welders	0	8.00	46	0.45
Testing	Cranes	0	8.00	226	0.29
Testing	Forklifts	0	8.00	89	0.20

Testing	Generator Sets	2	8.00	7	0.74
Testing	Off-Highway Trucks	5	8.00	310	0.38
Testing	Off-Highway Trucks	3	8.00	180	0.38
Testing	Rubber Tired Dozers	0	8.00	255	0.40
Testing	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Testing	Welders	0	8.00	46	0.45
Clean-up and Restoration	Excavators	0	8.00	162	0.38
Clean-up and Restoration	Graders	1	8.00	175	0.41
Clean-up and Restoration	Off-Highway Trucks	4	8.00	180	0.38
Clean-up and Restoration	Pavers	0	8.00	125	0.42
Clean-up and Restoration	Paving Equipment	0	8.00	130	0.36
Clean-up and Restoration	Rollers	0	8.00	80	0.38
Clean-up and Restoration	Rubber Tired Dozers	0	8.00	255	0.40
Clean-up and Restoration	Scrapers	0	8.00	361	0.48
Clean-up and Restoration	Tractors/Loaders/Backhoes	0	8.00	97	0.37

### Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	23	16.00	0.00	0.00	78.20	62.00	20.00	LD_Mix	HDT_Mix	HHDT
Underground Work	22	50.00	4.00	0.00	78.20	62.00	20.00	LD_Mix	HDT_Mix	HHDT
System Installation	35	115.00	7.00	5.00	78.20	62.00	120.00	LD_Mix	HDT_Mix	HHDT
Testing	10	30.00	0.00	0.00	78.20	62.00	20.00	LD_Mix	HDT_Mix	HHDT
Clean-up and Restoration	5	20.00	0.00	0.00	78.20	62.00	20.00	LD_Mix	HDT_Mix	HHDT

### 3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

Clean Paved Roads

### 3.2 Site Preparation - 2015

#### Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.2568	0.0000	0.2568	0.0863	0.0000	0.0863	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1264	1.3453	0.6249	1.0900e-003		0.0707	0.0707		0.0652	0.0652	0.0000	102.2777	102.2777	0.0300	0.0000	102.9070
<b>Total</b>	<b>0.1264</b>	<b>1.3453</b>	<b>0.6249</b>	<b>1.0900e-003</b>	<b>0.2568</b>	<b>0.0707</b>	<b>0.3275</b>	<b>0.0863</b>	<b>0.0652</b>	<b>0.1514</b>	<b>0.0000</b>	<b>102.2777</b>	<b>102.2777</b>	<b>0.0300</b>	<b>0.0000</b>	<b>102.9070</b>

**3.2 Site Preparation - 2015****Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.5700e-003	7.8000e-003	0.0705	1.2000e-004	0.0103	7.0000e-005	0.0104	2.7400e-003	6.0000e-005	2.8000e-003	0.0000	9.0945	9.0945	5.6000e-004	0.0000	9.1063
<b>Total</b>	<b>2.5700e-003</b>	<b>7.8000e-003</b>	<b>0.0705</b>	<b>1.2000e-004</b>	<b>0.0103</b>	<b>7.0000e-005</b>	<b>0.0104</b>	<b>2.7400e-003</b>	<b>6.0000e-005</b>	<b>2.8000e-003</b>	<b>0.0000</b>	<b>9.0945</b>	<b>9.0945</b>	<b>5.6000e-004</b>	<b>0.0000</b>	<b>9.1063</b>

**Mitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1156	0.0000	0.1156	0.0388	0.0000	0.0388	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0256	0.5009	0.5906	1.0900e-003		0.0209	0.0209		0.0209	0.0209	0.0000	102.2775	102.2775	0.0300	0.0000	102.9069
<b>Total</b>	<b>0.0256</b>	<b>0.5009</b>	<b>0.5906</b>	<b>1.0900e-003</b>	<b>0.1156</b>	<b>0.0209</b>	<b>0.1364</b>	<b>0.0388</b>	<b>0.0209</b>	<b>0.0597</b>	<b>0.0000</b>	<b>102.2775</b>	<b>102.2775</b>	<b>0.0300</b>	<b>0.0000</b>	<b>102.9069</b>

**3.2 Site Preparation - 2015****Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.5700e-003	7.8000e-003	0.0705	1.2000e-004	0.0103	7.0000e-005	0.0104	2.7400e-003	6.0000e-005	2.8000e-003	0.0000	9.0945	9.0945	5.6000e-004	0.0000	9.1063
<b>Total</b>	<b>2.5700e-003</b>	<b>7.8000e-003</b>	<b>0.0705</b>	<b>1.2000e-004</b>	<b>0.0103</b>	<b>7.0000e-005</b>	<b>0.0104</b>	<b>2.7400e-003</b>	<b>6.0000e-005</b>	<b>2.8000e-003</b>	<b>0.0000</b>	<b>9.0945</b>	<b>9.0945</b>	<b>5.6000e-004</b>	<b>0.0000</b>	<b>9.1063</b>

**3.3 Underground Work - 2015****Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2826	2.8451	1.4676	2.2600e-003		0.1695	0.1695		0.1563	0.1563	0.0000	211.6455	211.6455	0.0614	0.0000	212.9358
<b>Total</b>	<b>0.2826</b>	<b>2.8451</b>	<b>1.4676</b>	<b>2.2600e-003</b>	<b>0.0000</b>	<b>0.1695</b>	<b>0.1695</b>	<b>0.0000</b>	<b>0.1563</b>	<b>0.1563</b>	<b>0.0000</b>	<b>211.6455</b>	<b>211.6455</b>	<b>0.0614</b>	<b>0.0000</b>	<b>212.9358</b>

### 3.3 Underground Work - 2015

#### Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.9600e-003	0.0733	0.0468	1.9000e-004	6.0500e-003	2.1400e-003	8.1800e-003	1.7200e-003	1.9600e-003	3.6800e-003	0.0000	17.3671	17.3671	1.0000e-004	0.0000	17.3692
Worker	0.0201	0.0609	0.5510	9.2000e-004	0.0806	5.1000e-004	0.0811	0.0214	4.7000e-004	0.0219	0.0000	71.0505	71.0505	4.4000e-003	0.0000	71.1429
<b>Total</b>	<b>0.0241</b>	<b>0.1343</b>	<b>0.5978</b>	<b>1.1100e-003</b>	<b>0.0866</b>	<b>2.6500e-003</b>	<b>0.0893</b>	<b>0.0231</b>	<b>2.4300e-003</b>	<b>0.0255</b>	<b>0.0000</b>	<b>88.4176</b>	<b>88.4176</b>	<b>4.5000e-003</b>	<b>0.0000</b>	<b>88.5121</b>

#### Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0525	1.0204	1.3314	2.2600e-003		0.0439	0.0439		0.0439	0.0439	0.0000	211.6453	211.6453	0.0614	0.0000	212.9355
<b>Total</b>	<b>0.0525</b>	<b>1.0204</b>	<b>1.3314</b>	<b>2.2600e-003</b>	<b>0.0000</b>	<b>0.0439</b>	<b>0.0439</b>	<b>0.0000</b>	<b>0.0439</b>	<b>0.0439</b>	<b>0.0000</b>	<b>211.6453</b>	<b>211.6453</b>	<b>0.0614</b>	<b>0.0000</b>	<b>212.9355</b>

### 3.3 Underground Work - 2015

#### Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.9600e-003	0.0733	0.0468	1.9000e-004	6.0500e-003	2.1400e-003	8.1800e-003	1.7200e-003	1.9600e-003	3.6800e-003	0.0000	17.3671	17.3671	1.0000e-004	0.0000	17.3692
Worker	0.0201	0.0609	0.5510	9.2000e-004	0.0806	5.1000e-004	0.0811	0.0214	4.7000e-004	0.0219	0.0000	71.0505	71.0505	4.4000e-003	0.0000	71.1429
<b>Total</b>	<b>0.0241</b>	<b>0.1343</b>	<b>0.5978</b>	<b>1.1100e-003</b>	<b>0.0866</b>	<b>2.6500e-003</b>	<b>0.0893</b>	<b>0.0231</b>	<b>2.4300e-003</b>	<b>0.0255</b>	<b>0.0000</b>	<b>88.4176</b>	<b>88.4176</b>	<b>4.5000e-003</b>	<b>0.0000</b>	<b>88.5121</b>

### 3.3 Underground Work - 2016

#### Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.4053	4.0546	2.2386	3.5400e-003		0.2408	0.2408		0.2221	0.2221	0.0000	327.6686	327.6686	0.0960	0.0000	329.6851
<b>Total</b>	<b>0.4053</b>	<b>4.0546</b>	<b>2.2386</b>	<b>3.5400e-003</b>	<b>0.0000</b>	<b>0.2408</b>	<b>0.2408</b>	<b>0.0000</b>	<b>0.2221</b>	<b>0.2221</b>	<b>0.0000</b>	<b>327.6686</b>	<b>327.6686</b>	<b>0.0960</b>	<b>0.0000</b>	<b>329.6851</b>

### 3.3 Underground Work - 2016

#### Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.3700e-003	0.0974	0.0657	2.9000e-004	9.4600e-003	2.9400e-003	0.0124	2.6900e-003	2.7100e-003	5.3900e-003	0.0000	26.8371	26.8371	1.3000e-004	0.0000	26.8399
Worker	0.0266	0.0851	0.7645	1.4300e-003	0.1260	7.6000e-004	0.1268	0.0334	6.9000e-004	0.0341	0.0000	107.0218	107.0218	6.2900e-003	0.0000	107.1539
<b>Total</b>	<b>0.0320</b>	<b>0.1826</b>	<b>0.8302</b>	<b>1.7200e-003</b>	<b>0.1355</b>	<b>3.7000e-003</b>	<b>0.1392</b>	<b>0.0361</b>	<b>3.4000e-003</b>	<b>0.0395</b>	<b>0.0000</b>	<b>133.8589</b>	<b>133.8589</b>	<b>6.4200e-003</b>	<b>0.0000</b>	<b>133.9938</b>

#### Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0820	1.5955	2.0819	3.5400e-003		0.0686	0.0686		0.0686	0.0686	0.0000	327.6682	327.6682	0.0960	0.0000	329.6847
<b>Total</b>	<b>0.0820</b>	<b>1.5955</b>	<b>2.0819</b>	<b>3.5400e-003</b>	<b>0.0000</b>	<b>0.0686</b>	<b>0.0686</b>	<b>0.0000</b>	<b>0.0686</b>	<b>0.0686</b>	<b>0.0000</b>	<b>327.6682</b>	<b>327.6682</b>	<b>0.0960</b>	<b>0.0000</b>	<b>329.6847</b>



### 3.3 Underground Work - 2016

#### Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.3700e-003	0.0974	0.0657	2.9000e-004	9.4600e-003	2.9400e-003	0.0124	2.6900e-003	2.7100e-003	5.3900e-003	0.0000	26.8371	26.8371	1.3000e-004	0.0000	26.8399
Worker	0.0266	0.0851	0.7645	1.4300e-003	0.1260	7.6000e-004	0.1268	0.0334	6.9000e-004	0.0341	0.0000	107.0218	107.0218	6.2900e-003	0.0000	107.1539
<b>Total</b>	<b>0.0320</b>	<b>0.1826</b>	<b>0.8302</b>	<b>1.7200e-003</b>	<b>0.1355</b>	<b>3.7000e-003</b>	<b>0.1392</b>	<b>0.0361</b>	<b>3.4000e-003</b>	<b>0.0395</b>	<b>0.0000</b>	<b>133.8589</b>	<b>133.8589</b>	<b>6.4200e-003</b>	<b>0.0000</b>	<b>133.9938</b>

### 3.4 System Installation - 2016

#### Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.9424	9.0708	4.1939	9.3500e-003		0.4379	0.4379		0.4035	0.4035	0.0000	875.1420	875.1420	0.2614	0.0000	880.6303
<b>Total</b>	<b>0.9424</b>	<b>9.0708</b>	<b>4.1939</b>	<b>9.3500e-003</b>		<b>0.4379</b>	<b>0.4379</b>		<b>0.4035</b>	<b>0.4035</b>	<b>0.0000</b>	<b>875.1420</b>	<b>875.1420</b>	<b>0.2614</b>	<b>0.0000</b>	<b>880.6303</b>

**3.4 System Installation - 2016****Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.5000e-004	2.9700e-003	1.5900e-003	1.0000e-005	2.6000e-004	9.0000e-005	3.5000e-004	7.0000e-005	8.0000e-005	1.5000e-004	0.0000	0.9473	0.9473	0.0000	0.0000	0.9474
Vendor	0.0130	0.2359	0.1592	7.1000e-004	0.0229	7.1300e-003	0.0300	6.5100e-003	6.5600e-003	0.0131	0.0000	64.9864	64.9864	3.2000e-004	0.0000	64.9931
Worker	0.0846	0.2710	2.4330	4.5600e-003	0.4010	2.4200e-003	0.4034	0.1064	2.2100e-003	0.1086	0.0000	340.6031	340.6031	0.0200	0.0000	341.0235
<b>Total</b>	<b>0.0978</b>	<b>0.5098</b>	<b>2.5937</b>	<b>5.2800e-003</b>	<b>0.4242</b>	<b>9.6400e-003</b>	<b>0.4338</b>	<b>0.1130</b>	<b>8.8500e-003</b>	<b>0.1218</b>	<b>0.0000</b>	<b>406.5367</b>	<b>406.5367</b>	<b>0.0203</b>	<b>0.0000</b>	<b>406.9640</b>

**Mitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2331	4.5230	5.1120	9.3500e-003		0.1912	0.1912		0.1912	0.1912	0.0000	875.1409	875.1409	0.2614	0.0000	880.6293
<b>Total</b>	<b>0.2331</b>	<b>4.5230</b>	<b>5.1120</b>	<b>9.3500e-003</b>		<b>0.1912</b>	<b>0.1912</b>		<b>0.1912</b>	<b>0.1912</b>	<b>0.0000</b>	<b>875.1409</b>	<b>875.1409</b>	<b>0.2614</b>	<b>0.0000</b>	<b>880.6293</b>

### 3.4 System Installation - 2016

#### Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.5000e-004	2.9700e-003	1.5900e-003	1.0000e-005	2.6000e-004	9.0000e-005	3.5000e-004	7.0000e-005	8.0000e-005	1.5000e-004	0.0000	0.9473	0.9473	0.0000	0.0000	0.9474
Vendor	0.0130	0.2359	0.1592	7.1000e-004	0.0229	7.1300e-003	0.0300	6.5100e-003	6.5600e-003	0.0131	0.0000	64.9864	64.9864	3.2000e-004	0.0000	64.9931
Worker	0.0846	0.2710	2.4330	4.5600e-003	0.4010	2.4200e-003	0.4034	0.1064	2.2100e-003	0.1086	0.0000	340.6031	340.6031	0.0200	0.0000	341.0235
<b>Total</b>	<b>0.0978</b>	<b>0.5098</b>	<b>2.5937</b>	<b>5.2800e-003</b>	<b>0.4242</b>	<b>9.6400e-003</b>	<b>0.4338</b>	<b>0.1130</b>	<b>8.8500e-003</b>	<b>0.1218</b>	<b>0.0000</b>	<b>406.5367</b>	<b>406.5367</b>	<b>0.0203</b>	<b>0.0000</b>	<b>406.9640</b>

### 3.5 Testing - 2016

#### Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0593	0.6647	0.2953	7.7000e-004		0.0263	0.0263		0.0242	0.0242	0.0000	72.0373	72.0373	0.0215	0.0000	72.4895
<b>Total</b>	<b>0.0593</b>	<b>0.6647</b>	<b>0.2953</b>	<b>7.7000e-004</b>	<b>0.0000</b>	<b>0.0263</b>	<b>0.0263</b>	<b>0.0000</b>	<b>0.0242</b>	<b>0.0242</b>	<b>0.0000</b>	<b>72.0373</b>	<b>72.0373</b>	<b>0.0215</b>	<b>0.0000</b>	<b>72.4895</b>

**3.5 Testing - 2016****Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.0800e-003	0.0131	0.1173	2.2000e-004	0.0193	1.2000e-004	0.0195	5.1300e-003	1.1000e-004	5.2400e-003	0.0000	16.4266	16.4266	9.7000e-004	0.0000	16.4469
<b>Total</b>	<b>4.0800e-003</b>	<b>0.0131</b>	<b>0.1173</b>	<b>2.2000e-004</b>	<b>0.0193</b>	<b>1.2000e-004</b>	<b>0.0195</b>	<b>5.1300e-003</b>	<b>1.1000e-004</b>	<b>5.2400e-003</b>	<b>0.0000</b>	<b>16.4266</b>	<b>16.4266</b>	<b>9.7000e-004</b>	<b>0.0000</b>	<b>16.4469</b>

**Mitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0185	0.3575	0.4006	7.7000e-004		0.0136	0.0136		0.0136	0.0136	0.0000	72.0372	72.0372	0.0215	0.0000	72.4895
<b>Total</b>	<b>0.0185</b>	<b>0.3575</b>	<b>0.4006</b>	<b>7.7000e-004</b>	<b>0.0000</b>	<b>0.0136</b>	<b>0.0136</b>	<b>0.0000</b>	<b>0.0136</b>	<b>0.0136</b>	<b>0.0000</b>	<b>72.0372</b>	<b>72.0372</b>	<b>0.0215</b>	<b>0.0000</b>	<b>72.4895</b>

### 3.5 Testing - 2016

#### Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.0800e-003	0.0131	0.1173	2.2000e-004	0.0193	1.2000e-004	0.0195	5.1300e-003	1.1000e-004	5.2400e-003	0.0000	16.4266	16.4266	9.7000e-004	0.0000	16.4469
<b>Total</b>	<b>4.0800e-003</b>	<b>0.0131</b>	<b>0.1173</b>	<b>2.2000e-004</b>	<b>0.0193</b>	<b>1.2000e-004</b>	<b>0.0195</b>	<b>5.1300e-003</b>	<b>1.1000e-004</b>	<b>5.2400e-003</b>	<b>0.0000</b>	<b>16.4266</b>	<b>16.4266</b>	<b>9.7000e-004</b>	<b>0.0000</b>	<b>16.4469</b>

### 3.6 Clean-up and Restoration - 2016

#### Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0311	0.0000	0.0311	3.3600e-003	0.0000	3.3600e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0333	0.3542	0.1444	3.1000e-004		0.0167	0.0167		0.0154	0.0154	0.0000	29.3175	29.3175	8.8400e-003	0.0000	29.5032
<b>Total</b>	<b>0.0333</b>	<b>0.3542</b>	<b>0.1444</b>	<b>3.1000e-004</b>	<b>0.0311</b>	<b>0.0167</b>	<b>0.0478</b>	<b>3.3600e-003</b>	<b>0.0154</b>	<b>0.0187</b>	<b>0.0000</b>	<b>29.3175</b>	<b>29.3175</b>	<b>8.8400e-003</b>	<b>0.0000</b>	<b>29.5032</b>

### 3.6 Clean-up and Restoration - 2016

#### Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.6000e-003	8.3200e-003	0.0747	1.4000e-004	0.0123	7.0000e-005	0.0124	3.2700e-003	7.0000e-005	3.3300e-003	0.0000	10.4533	10.4533	6.1000e-004	0.0000	10.4662
<b>Total</b>	<b>2.6000e-003</b>	<b>8.3200e-003</b>	<b>0.0747</b>	<b>1.4000e-004</b>	<b>0.0123</b>	<b>7.0000e-005</b>	<b>0.0124</b>	<b>3.2700e-003</b>	<b>7.0000e-005</b>	<b>3.3300e-003</b>	<b>0.0000</b>	<b>10.4533</b>	<b>10.4533</b>	<b>6.1000e-004</b>	<b>0.0000</b>	<b>10.4662</b>

#### Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0140	0.0000	0.0140	1.5100e-003	0.0000	1.5100e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.6700e-003	0.1484	0.1663	3.1000e-004		5.6300e-003	5.6300e-003		5.6300e-003	5.6300e-003	0.0000	29.3175	29.3175	8.8400e-003	0.0000	29.5032
<b>Total</b>	<b>7.6700e-003</b>	<b>0.1484</b>	<b>0.1663</b>	<b>3.1000e-004</b>	<b>0.0140</b>	<b>5.6300e-003</b>	<b>0.0196</b>	<b>1.5100e-003</b>	<b>5.6300e-003</b>	<b>7.1400e-003</b>	<b>0.0000</b>	<b>29.3175</b>	<b>29.3175</b>	<b>8.8400e-003</b>	<b>0.0000</b>	<b>29.5032</b>

### 3.6 Clean-up and Restoration - 2016

#### Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.6000e-003	8.3200e-003	0.0747	1.4000e-004	0.0123	7.0000e-005	0.0124	3.2700e-003	7.0000e-005	3.3300e-003	0.0000	10.4533	10.4533	6.1000e-004	0.0000	10.4662
<b>Total</b>	<b>2.6000e-003</b>	<b>8.3200e-003</b>	<b>0.0747</b>	<b>1.4000e-004</b>	<b>0.0123</b>	<b>7.0000e-005</b>	<b>0.0124</b>	<b>3.2700e-003</b>	<b>7.0000e-005</b>	<b>3.3300e-003</b>	<b>0.0000</b>	<b>10.4533</b>	<b>10.4533</b>	<b>6.1000e-004</b>	<b>0.0000</b>	<b>10.4662</b>

### 4.0 Operational Detail - Mobile

#### 4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0111	0.0766	0.2305	5.3000e-004	0.0349	1.4100e-003	0.0363	9.3400e-003	1.3000e-003	0.0106	0.0000	42.4860	42.4860	1.5600e-003	0.0000	42.5187
Unmitigated	0.0111	0.0766	0.2305	5.3000e-004	0.0349	1.4100e-003	0.0363	9.3400e-003	1.3000e-003	0.0106	0.0000	42.4860	42.4860	1.5600e-003	0.0000	42.5187

## 4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
User Defined Industrial	4.69	0.00	0.00	91,395	91,395
Total	4.69	0.00	0.00	91,395	91,395

## 4.3 Trip Type Information

Land Use	Miles			Trip %			Trip Purpose %		
	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
User Defined Industrial	78.20	6.60	62.00	80.00	0.00	20.00	100	0	0

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.448800	0.067422	0.174832	0.157112	0.043057	0.007351	0.008222	0.079046	0.001032	0.001383	0.007979	0.000545	0.003219

## 5.0 Energy Detail

### 4.4 Fleet Mix

Historical Energy Use: N

## 5.1 Mitigation Measures Energy



[illegible]

## 5.2 Energy by Land Use - NaturalGas

### Unmitigated

[illegible]

## 5.2 Energy by Land Use - NaturalGas

### Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
<b>Total</b>		<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>		<b>0.0000</b>	<b>0.0000</b>		<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>

## 5.3 Energy by Land Use - Electricity

### Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
<b>Total</b>		<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>

### 5.3 Energy by Land Use - Electricity

#### Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
<b>Total</b>		<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>

### 6.0 Area Detail

#### 6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	2.2000e-004	2.0000e-005	2.2100e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	4.1900e-003	4.1900e-003	1.0000e-005	0.0000	4.4400e-003
Unmitigated	2.2000e-004	2.0000e-005	2.2100e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	4.1900e-003	4.1900e-003	1.0000e-005	0.0000	4.4400e-003

## 6.2 Area by SubCategory

### Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	2.2000e-004	2.0000e-005	2.2100e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	4.1900e-003	4.1900e-003	1.0000e-005	0.0000	4.4400e-003
<b>Total</b>	<b>2.2000e-004</b>	<b>2.0000e-005</b>	<b>2.2100e-003</b>	<b>0.0000</b>		<b>1.0000e-005</b>	<b>1.0000e-005</b>		<b>1.0000e-005</b>	<b>1.0000e-005</b>	<b>0.0000</b>	<b>4.1900e-003</b>	<b>4.1900e-003</b>	<b>1.0000e-005</b>	<b>0.0000</b>	<b>4.4400e-003</b>

### Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	2.2000e-004	2.0000e-005	2.2100e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	4.1900e-003	4.1900e-003	1.0000e-005	0.0000	4.4400e-003
<b>Total</b>	<b>2.2000e-004</b>	<b>2.0000e-005</b>	<b>2.2100e-003</b>	<b>0.0000</b>		<b>1.0000e-005</b>	<b>1.0000e-005</b>		<b>1.0000e-005</b>	<b>1.0000e-005</b>	<b>0.0000</b>	<b>4.1900e-003</b>	<b>4.1900e-003</b>	<b>1.0000e-005</b>	<b>0.0000</b>	<b>4.4400e-003</b>

## 7.0 Water Detail

## 7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

## 7.2 Water by Land Use

### Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
User Defined Industrial	0 / 0	0.0000	0.0000	0.0000	0.0000
<b>Total</b>		<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>

## 7.2 Water by Land Use

### Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
User Defined Industrial	0 / 0	0.0000	0.0000	0.0000	0.0000
<b>Total</b>		<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>

## 8.0 Waste Detail

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### 8.1 Mitigation Measures Waste

#### Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

## 8.2 Waste by Land Use

### Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
<b>Total</b>		<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>

### Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
<b>Total</b>		<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>

## 9.0 Operational Offroad

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Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type
Forklifts	1	8.00	80	75	0.20	Diesel
Off-Highway Trucks	1	8.00	80	210	0.38	Diesel
Off-Highway Trucks	1	8.00	80	180	0.38	Diesel
Other General Industrial Equipment	1	8.00	80	87	0.34	Diesel
Tractors/Loaders/Backhoes	1	8.00	80	120	0.37	Diesel

**UnMitigated/Mitigated**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Equipment Type	tons/yr										MT/yr					
Off-Highway Trucks	0.0466	0.5046	0.1907	5.1000e-004		0.0217	0.0217		0.0200	0.0200	0.0000	47.6586	47.6586	0.0144	0.0000	47.9605
Other General Industrial Equipment	0.0149	0.1282	0.0844	1.0000e-004		0.0108	0.0108		9.9400e-003	9.9400e-003	0.0000	9.5403	9.5403	2.8800e-003	0.0000	9.6007
Tractors/Loaders/Backhoes	0.0169	0.1611	0.1194	1.5000e-004		0.0124	0.0124		0.0114	0.0114	0.0000	14.5304	14.5304	4.3800e-003	0.0000	14.6224
Forklifts	7.6500e-003	0.0658	0.0426	5.0000e-005		5.5100e-003	5.5100e-003		5.0700e-003	5.0700e-003	0.0000	4.8536	4.8536	1.4600e-003	0.0000	4.8843
<b>Total</b>	<b>0.0860</b>	<b>0.8598</b>	<b>0.4371</b>	<b>8.1000e-004</b>		<b>0.0504</b>	<b>0.0504</b>		<b>0.0464</b>	<b>0.0464</b>	<b>0.0000</b>	<b>76.5828</b>	<b>76.5828</b>	<b>0.0231</b>	<b>0.0000</b>	<b>77.0679</b>

**10.0 Vegetation**