Calico Solar

March 18, 2010

DOCKET
08-AFC-13C
DATE 3-18-2011
RECD. 3-22-2011

Craig Hoffman
Compliance Project Manager
California Energy Commission
1516 Ninth Street, MS-2000
Sacramento, CA 95814

Subject: Calico Solar Project—Petition to Amend

Dear Mr. Hoffman:

Enclosed are 15 hard copies and 10 electronic copies of the petition to amend (Amendment) relating to the Calico Solar Project (Project).

This Amendment does not propose to change the size, boundary, or generating capacity of the approved Project. It rather proposes a partial modification in the solar collector technology used on the Project site. The Project will generate 100.5 MW of power using the SunCatcher technology and 563 MW using single-axis tracker photovoltaic (PV) technology. Both the SunCatchers and the PV collectors will be fully integrated components of the power plant, operate from the single control room, utilize the same transmission interconnection system, access the common water system and road network, and depend on the same construction and operation personnel.

The Amendment also proposes to alter the phasing of the Project to reduce access issues associated with the northern portion of the Project site. Phase 1 will now be located primarily south of the railroad and will include the main access road, the main services complex, the on-site substation with a shorter transmission line interconnecting with the Pisgah Substation, a water well (located north of the railroad), a waterline and a portion of the PV solar collectors. Phase 2 will be located entirely north of the railroad and will include the remainder of the PV solar collectors and the SunCatchers. The SunCatchers will be located toward the center of Phase 2 to reduce noise impacts on wildlife and the glint and glare concerns.

We look forward to working with the Commission and the other agencies in processing this amendment. Please let me know if you have any questions or need additional information.

Sincerely,

Daniel J. O'Shea
On behalf of Calico Solar, LLC

CALICO SOLAR

Petition to Amend

03.18.11

CALICO SOLAR PROJECT

08-AFC-13

Submitted by:
Calico Solar, LLC
Calico Solar

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Appendix F Noise Modeling Results
Appendix G List of Nearby Property Owners

AFC	Application for Certification
afy	acre-feet per year
Amendment	Petition to Amend Approved Project
Approved Project	Calico Solar Project
ARRA	American Recovery and Reinvestment Act
BLM	Bureau of Land Management
BMP	Best Management Practice
BNSF	BNSF Railway Company
BO	Biological Opinion
CAISO	California Independent System Operator
Calico Solar	Calico Solar, LLC
CBC	California Building Code
CCR	California Code of Regulations
CDFG	California Department of Fish and Game
CFR	Code of Federal Regulations
Commission	California Energy Commission
Commission Decision	Decision issued by Commission regarding Approved Project
Conditions	Conditions of Certification
CPM	Compliance Project Manager
CPUC	California Public Utilities Commission
CRHR	California Register of Historical Resources
dBA	decibel
DC	direct current
DESCP	drainage, erosion and sediment control plan
DOC	determination of compliance
EMF	electromagnetic field
GHG	greenhouse gas
Hz	hertz
I-40	Interstate 40
KOP	Key Observation Point
kW	kilowatt
LORS	laws, ordinances, regulations and standards
LVRT	low-voltage ride-through
MDAQMD	Mojave Desert Air Quality Management District
mg/L	milligrams per liter
Modified Project	Amended Calico Solar Project
MW	megawatt
MWh	megawatt hour
NERC	North American Electric Reliability Corporation
NPDES	National Pollution Discharge Elimination System
NRHP	National Register of Historic Places
OCA	Off-site Consequence Analysis
PCU	power conversion unit
Project	Approved Project or Modified Project (depending on context)
psi	pounds per square inch

PV	photovoltaic
QA/QC	quality assurance/quality control
RMP	Risk Management Plan
RO	reverse osmosis
ROW	right-of-way
ROWD	Report of Waste Discharge
RPS	Renewable Portfolio Standard
RUSLE	Revised Universal Soil Loss Equation
RUSLE2	Revised Universal Soil Loss Equation Version 2
RWQCB	California Regional Water Quality Control Board, Lahontan Region
SCE	Southern California Edison Company
scf	standard cubic foot
SES	Stirling Energy Systems
SIS	System Impact Study
SOC	Standard Occupational Classification
SSA	Supplemental Staff Assessment
SWQCB	(California) State Water Quality Control Board
SWPPP	Stormwater Pollution Prevention Plan
TAC	toxic air contaminant
TDS	total dissolved solids
VAC	volts alternating current
WSA	Wilderness Study Area

SECTION 1 INTRODUCTION

The following sections provide information regarding the background of the proposed Calico Solar Project (Approved Project), the purpose for this petition to amend the Approved Project (Amendment), the scope of the analysis conducted for this document, and the organization of the document.

1.1 BACKGROUND

On December 1, 2010, the California Energy Commission (Commission) issued a decision (Commission Decision) approving and licensing the Approved Project to be owned and operated by Calico Solar, LLC (Calico Solar). As approved in the Commission Decision on the Application for Certification (AFC), the Project[1] site is located on 4,613 acres of land in San Bernardino County, California, which are primarily administered by the Bureau of Land Management (BLM). The BLM issued a right-of-way (ROW) grant for the Approved Project on October 21, 2010. The Approved Project has a generating capacity of 663.5 megawatts (MW) that would be produced by solar collectors called "SunCatchers™". Each SunCatcher consists of an approximately 38-foot-diameter mirrored dish and a Stirling engine powered by hydrogen generated on site. The Approved Project would deliver power to the Southern California Edison (SCE) Pisgah Substation.

1.2 PURPOSE

This Amendment proposes to amend the Approved Project by: (1) utilizing additional technology to generate power at the facility, and (2) modifying the phasing outlined in the Approved Project. The Approved Project, as modified (Modified Project), would generate 100.5 MW of power using the SunCatcher technology. Additional power, up to 563 MW, would be produced using single-axis tracker photovoltaic (PV) technology. Both the SunCatchers and the PV technology would be fully integrated components of the power plant, operate from the single control room, utilize the same transmission interconnection system, access the common water system and road network, and depend on the same construction and operation personnel (Figure 1-1).

The Modified Project would be the same size and would have the same footprint and boundaries as the Approved Project. The Amendment proposes to alter the phasing of the Approved Project, to allow time to resolve access issues to the northern portion of the site involving the BNSF Railway Company (BNSF). Phase 1 of the Modified Project would be located primarily south of the railroad and would include the main access road, the relocated main services complex, the on-site substation, and a portion of the PV modules. The well and a portion of the waterline would be constructed north of the railroad in Phase 1. Phase 2 of the Modified Project would be located north of the railroad and would include the remainder of the PV modules and the SunCatchers, as well as the hydrogen infrastructure. The SunCatchers would be located toward the center of Phase 2.

[1] "Project" refers either to the Approved Project or the Modified Project, depending on context.

1.3 SCOPE OF ANALYSIS

The analysis contained in this Amendment evaluates the environmental impacts and conformance with applicable laws, ordinances, regulations and standards (LORS) resulting from the Modified Project as compared to the Approved Project. The Amendment also includes proposed changes to the mitigation measures and conforming changes to the Conditions of Certification (Conditions) for the Modified Project.

1.4 ORGANIZATION

This Amendment is organized based on the information required in Section 1769(a)(1) of the Commission's Power Plant Siting Regulations. The sections in this Amendment, following this introductory section, are described below:

Section 2 – Project Modification Description: Describes the proposed changes to the Approved Project.

Section 3 – Necessity of Proposed Modifications: Addresses why the changes are necessary and how they relate to the Approved Project licensing proceedings.

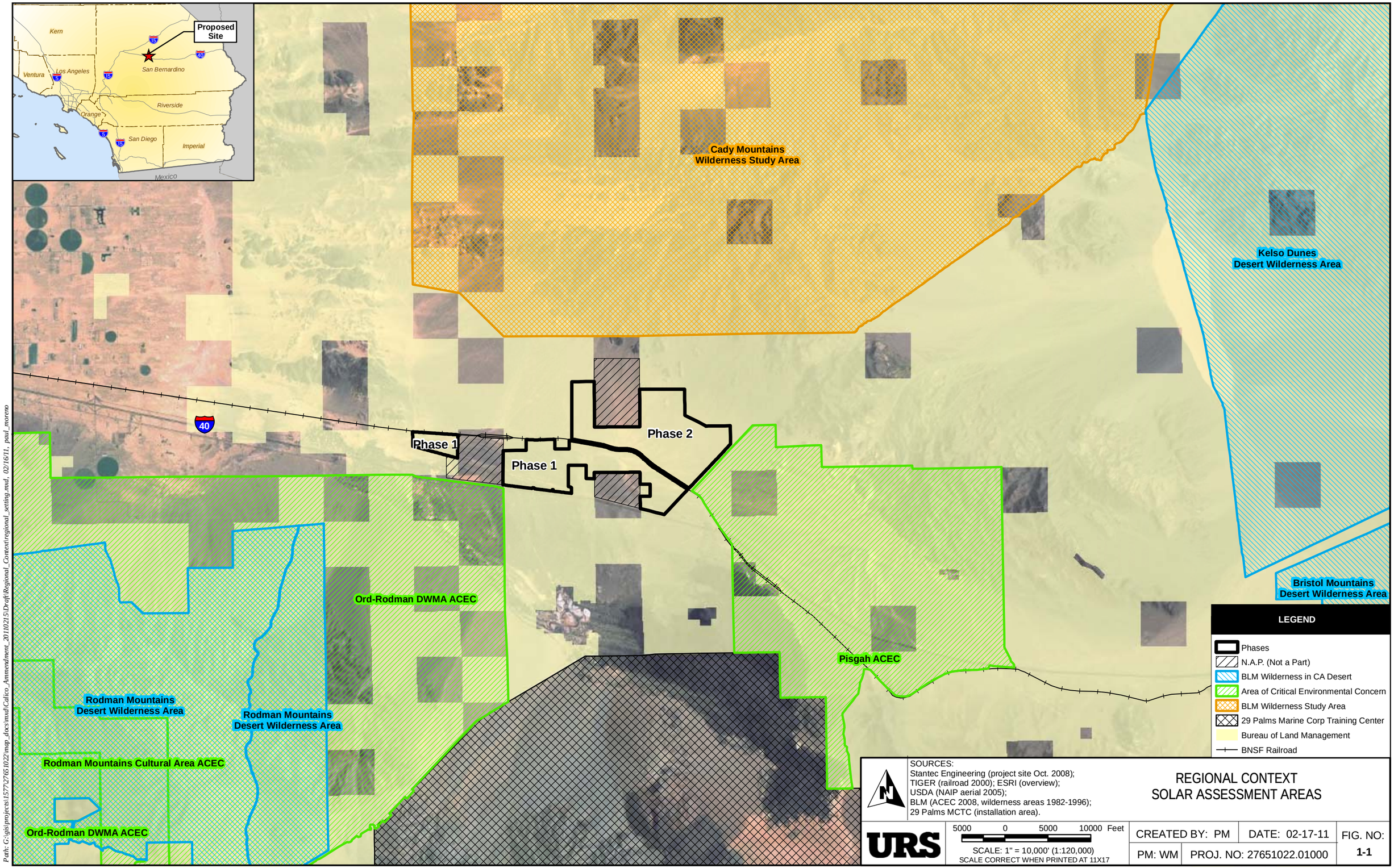
Section 4 – Environmental Impact Analysis of Proposed Amendment: Addresses, for each technical area evaluated during the licensing proceedings, the following:

- Summary of Project Changes;
- Changes in Environmental Impacts;
- Changes in Cumulative Environmental Impacts;
- Changes in LORS Conformance and Other Permits;
- Changes in Proposed Mitigation; and
- Changes in Conditions of Certification..

This section also evaluates potential alternatives related to the Modified Project. Additionally, the Conditions of Certification (Conditions) as proposed by Calico Solar have been compiled in a single, clean document and are provided as Appendix A.

Section 5 – Public and Private Property: Discusses the relationship of Modified Project to the public, nearby property owners, and participants in the licensing proceeding.

Section 6 – Conclusions and Recommendations: Provides a summary of technical resource impact conclusions, and recommends that the Commission approve the Amendment.



SOURCES:
Stantec Engineering (project site Oct. 2008);
TIGER (railroad 2000); ESRI (overview);
USDA (NAIP aerial 2005);
BLM (ACEC 2008, wilderness areas 1982-1996);
29 Palms MCTC (installation area).

REGIONAL CONTEXT
SOLAR ASSESSMENT AREAS

URS

5000 0 5000 10000 Feet
SCALE: 1" = 10,000' (1:120,000)
SCALE CORRECT WHEN PRINTED AT 11X17

CREATED BY: PM	DATE: 02-17-11	FIG. NO:
PM: WM	PROJ. NO: 27651022.01000	1-1

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SECTION 2 PROJECT MODIFICATION DESCRIPTION

Consistent with Commission Siting Regulations (Title 20, CCR, Section 1769(a)(1)(A)), this section includes a description of the Modified Project as compared to the Approved Project.

2.1 PROJECT DESCRIPTION SUMMARY

The following sections provide a description of Phases 1 and 2 of the Approved Project and the Modified Project.

2.1.1 Description of Approved Project

Phase 1 of the Approved Project, which is located primarily north of the railroad and is comprised of 1,876 acres (as shown on Figure 2-1), includes the following elements:

- main access road;
- bridge constructed over the railroad;
- main services complex (including temporary lay down area);
- on-site substation and two-mile transmission line to the Pisgah Substation;
- water well and an approximately one-mile waterline to the main services complex;
- solar field comprised of SunCatchers producing up to 275 MW; and
- hydrogen generation, storage, and distribution system for SunCatchers located north of the railroad.

Phase 2 of the Approved Project, which is located south of the railroad and north of Phase 1, is comprised of 2,737 acres (as shown on Figure 2-1), and includes the following elements:

- solar field comprised of SunCatchers producing up to 388.5 MW; and
- hydrogen generation, storage, and distribution system for the SunCatchers located south of the railroad.

2.1.2 Description of Modified Project

Calico Solar proposes changes to the approved site layout and technology associated with the Approved Project (as shown on Figure 2-2).

- The proposed technology to be utilized on the Modified Project would be modified to include 563 MW of PV modules mounted on single-axis trackers, and 100.5 MW of SunCatchers.
- The phasing of the Modified Project would include construction of Phase 1 primarily south of the BNSF railroad and Phase 2 north of the railroad.

Phase 1 of the Modified Project, which is primarily located south of the railroad and comprises approximately 2,144 acres (as shown on Figure 2-2), would include the following elements:

- main access road;
- relocated main services complex (including temporary lay down area);
- relocated on-site substation and shortened transmission line to the Pisgah Substation;
- water well located north of the railroad, and waterline to the main services complex (same source and well location, with a longer waterline crossing under the railroad); and
- solar field comprised of single-axis tracking PV modules producing up to 275 MW.

Phase 2 of the Modified Project, which is located north of the railroad and comprises 2,469 acres (as shown on Figure 2-2), would include the following elements:

- bridge constructed over the railroad;
- continuation of the main access road north of railroad;
- solar field, comprised of up to 288 MW of single-axis tracking PV modules and 100.5 MW of SunCatchers, to be located toward the center of Phase 2; and
- hydrogen generation, storage, and distribution system for SunCatchers.

2.2 TECHNOLOGY

The following sections describe the electrical generation technology that has been permitted for the Approved Project, and the utilization of additional technology as part of the Modified Project.

2.2.1 Permitted Electrical Generation Technology

The SunCatcher is a 25-kilowatt-electrical (kW) solar dish system, manufactured by Stirling Energy Systems (SES), designed to automatically track the sun and collect and focus solar energy onto a power conversion unit (PCU) that generates electricity. The system consists of an approximately 38-foot-diameter solar concentrator in a dish structure that supports an array of curved glass mirror facets. These mirrors collect and concentrate solar energy onto the solar receiver of the PCU. The SunCatchers are installed in 60 unit groups, each occupying approximately 11 acres and producing 1.5 MW.

The PCU converts the focused solar thermal energy into electricity. The conversion process in the PCU involves a closed-cycle, 4-cylinder, 35-horsepower reciprocating Stirling Engine utilizing an internal working fluid of hydrogen gas that is recycled through the engine. The Stirling Engine operates with heat input from the sun that is focused by the SunCatcher's dish assembly mirrors onto the PCU's solar receiver tubes, which contain hydrogen gas. The PCU solar receiver is an external heat exchanger that absorbs the incoming solar thermal energy. This heats and pressurizes the hydrogen gas in the heat exchanger tubing, and the gas, in turn, powers the Stirling Engine. The hydrogen would be piped to individual compressor groups that include a compressor, a high pressure supply tank and a low pressure dump tank, used to recover hydrogen from non-operational PCU's through a return line.

A generator is connected to the Stirling Engine to produce the electrical output of the SunCatcher. Each generator is capable of producing 25 kW at 575 volts alternating current (VAC)/60 hertz (Hz) of grid-quality electricity when operating with rated solar input. Waste heat from the engine is transferred to the ambient air via a radiator system similar to those used in automobiles. The hydrogen gas is cooled by a standard glycol-water radiator system and is continually recycled in the engine during the power cycle. The conversion process does not consume water. The only water use required by the SunCatcher is for washing the mirrors to remove accumulated dust and replenishing small losses to the cooling system radiator that uses a coolant consisting of a 50-50 ratio of ethylene glycol and water.

2.2.2 Proposed Modifications to Site Technology

Calico Solar is proposing to use a combination of PV technology and the permitted SunCatcher technology to achieve the approved 663.5 MW electrical generation for the Modified Project. Approximately 2,140 PV Tracker Blocks are proposed to produce a total of 563 MW of the total 663.5 MW permitted. SunCatchers would provide the remaining 100.5 MW.

These PV Tracker Blocks are the basic building blocks of the PV arrays. Each basic Tracker Block would be similar in configuration and capability. The Tracker Blocks are each controlled by a single tracker motor and control system which rotates all of the modules within a Tracker Block in unison around a north-south axis as they follow the daily movement of the sun from east to west.

The Tracker Blocks are made up of approximately 19 rows containing approximately 48 PV modules, totaling over 900 modules per Tracker Block. A basic Tracker Block will measure approximately 280 feet by 170 feet and occupy a space of approximately 1.1 acres. The size of each Tracker Block may be reduced as required by site characteristics such as boundaries, roads, topography, or similar constraints (Figures 2-3A through S).

The PV modules that make up the Tracker Blocks have the capability to convert the sun's energy into direct current (DC) electricity, each producing a relatively small amount of electricity, about several hundred watts each at rated conditions. Modules are electrically connected in series and parallel arrangements. A series arrangement increases the collective output voltage and a parallel arrangement increases the current to the desired levels for the DC collection system.

The modules being considered for this Modified Project are produced by a number of world-class companies that have excelled in this industry. Among them are SunPower, Suntech, Yingli, Q-Cells, Trina, and other manufacturers of silicon crystalline modules. For reasons of availability to support the Modified Project delivery requirements, multiple sources might be utilized. This is a common practice in the industry. Modules are generally quite similar in their physical and performance characteristics. They tend to be about 77 inches tall, 40 inches wide, and 2 inches thick and weigh approximately 55 pounds. Each module is encapsulated with tempered glass (or similar transparent material) on the front surface, with a protective and waterproof material on the back. The edges are sealed for weatherproofing, and there is often an aluminum frame holding everything together in a mountable unit. On the back of the module, there is a junction box, or wire leads, providing electrical connections.

A typical row consists of 48 PV modules attached to a horizontal steel shaft. These shafts are supported by 4.5-inch-diameter vertical steel posts that are spaced approximately 12 to 15 feet apart. The steel

shafts are connected by a main drive shaft, which is supported by 6-inch-diameter steel posts. Both the 4.5-inch and the 6-inch steel posts generally project 5 to 6 feet above the ground and are vibrated to a roughly equivalent depth into the ground. To account for minor ground surface differences, instead of grading, the steel posts would vary in height above the ground surface more than the 5 to 6 feet mentioned above in order to create a level Tracker Block. At maximum tilt, the modules will be at least 3 feet from the ground surface as well as 3 feet above the shaft, for a total height of approximately 9 feet (as shown in Figure 2-4).

The energy produced by each Tracker Block is directed to one of the approximately 282 inverter pads. Each 2 MW inverter pad is approximately 33.5 feet by 15 feet and will contain two or more inverters, one step-up 450 volt to 34.5 kV transformer, and one main line distribution switchboard mounted on a foundation. As a result of the recent increases in the size of PV projects, inverter suppliers are actively developing larger units to allow fewer inverters per MW. The inverter pads have been selected to take advantage of this trend. The inverters not only convert the DC energy from the modules to 60 Hz but they also provide the power quality functions of voltage regulation, power factor control, low-voltage ride through (LVRT), and supervisory control function, in accordance with SCE system and California Independent System Operator (CAISO)[2] requirements. From the inverter pads, the electricity runs through underground wires and on posts to the on-site substation where it is stepped up to the 230 kV required for the SCE interconnection. The collection system would be very similar to the Approved Project's mid-range collection system used with the SunCatcher.

2.3 PROJECT CONSTRUCTION AND OPERATION

The following paragraphs describe the construction activities and methods associated with the Modified Project, as well as the operation of the Modified Project.

2.3.1 Summary of Construction Activities and Methods of the Modified Project

While the construction activities and methods proposed for the Modified Project would be similar to those described under the Approved Project in the Commission Decision, the intensity of the construction activities would be reduced under the Modified Project. Installation of steel posts to support PV modules would not require the same heavy equipment as is required for SunCatcher pedestal and dish installation. Also, because PV technology does not require intense on-site assembly, the size of the workforce required during construction of the Modified Project would be reduced from the workforce required under the Approved Project. As a result, fewer construction vehicles would be needed for the Modified Project. The construction of the Modified Project is expected to take approximately four years, however, power could be available to Pisgah Substation as each Tracker Block or group of SunCatchers is completed. As with the Approved Project, temporary power would be supplied by generators during construction of the Modified Project.

Calico Solar would access Phase 1 Project features north of the railroad at a crossing to be agreed upon with BNSF. A temporary crossing agreed upon by BNSF may also be utilized during construction of the above-grade permanent bridge crossing, which would be one of the initial activities of Phase 2. Calico

[2] The CAISO is a non-profit public benefit corporation charged with operating the majority of California's high-voltage wholesale power grid.

Solar is currently in negotiation with BNSF regarding access, and would obtain all necessary approvals and permits for this proposed access. After completion of bridge, the bridge would provide the permanent access point to the Modified Project area north of the railroad for completion of Phase 2 construction activities, as well as during operation of the facility.

2.3.2 Summary of Modified Project Operations

The Modified Project would operate 7 days per week, generating electricity during normal daylight hours when the solar energy is available. PV technology requires significantly lower maintenance (e.g., fewer moving parts and fewer periodic replacements of parts) and less washing than the SunCatcher technology. Therefore, the Modified Project would employ a reduced permanent workforce during operations. Under the Approved Project, the height of SunCatchers (approximately 40 feet above the ground surface) and the frequency of washings (monthly), would necessitate washing trucks with a mounted boom travelling and improved SunCatcher maintenance roads treated with soil stabilizer were contemplated between every other row of SunCatcher roads. Under the Modified Project, the SunCatcher operations and maintenance would remain the same as the Approved Project. For the operation and maintenance of the PV portion of the Modified Project, no roads within the Tracker Blocks would be needed. Instead, up to four times a year, small vehicles would travel on unimproved module access points that would alternate with areas of native soil between every other row of PV modules.

Table 2-1, below, compares the list of significant structures and equipment for the Approved Project to those of the Modified Project.

Table 2-1
Significant Structures and Equipment

Description	Permitted Qty	Modified Qty	Length (feet)	Width (feet)	Height (feet)	Change
SunCatcher power generating system	26,540	4,020	38 diameter		40	Quantity Reduced
Main Services Complex administration building	1	1	60	70	17	Relocated
PV Tracker Blocks	--	2,140	280	170	9	Added
2 MW Inverter Pads	--	282	33.5	15	9	Added
Modules	--	1,951,680	6.4	3.3	0.17	Added
Main Services Complex maintenance building	1	1	70	70	17	Relocated
SunCatcher assembly building (temporary)	2	2	1,000	100	78	Relocated
Well water storage tank and Fire Water 230,000 gallons	1	1	40 diameter		25[1]	None
Demineralized water tank, 17,500 gallons[1]	2	2	18 diameter		10	None
Potable Water Tank, 5,000 gallons	1	1	10 diameter		10[1]	None
230 kV transmission line towers, double circuit with upswept arms	12 to 15	0 to 3	--	32	90 to 110	Quantity Reduced
Generator collection sub-panel; distribution panel, 42 circuit, 400-A, 600 V, with circuit breakers in a weatherproof enclosure	2,212[1]	335	1	2.67	5	Quantity Reduced
Generator collection power center, 2,000-A distribution panels with five 400-A circuit breakers and 1200A circuit breaker for 1 MVar capacitor bank	443[4]	67	2.5	3.33	7.5	Quantity Reduced
Collector group GSU transformer, 1,750 kVA, 575 V to 34.5 kV, with taps	443[1]	67	6.67	7.5	6.67	Quantity Reduced
Power Factor correction capacitor, 600 V, 1,000 kVAR, switched in five, each 200 kVAR steps	443[1]	67	2.5	6.67	7.5	Quantity Reduced

Table 2-1
Significant Structures and Equipment
(Continued)

Description	Permitted Qty	Modified Qty	Length (feet)	Width (feet)	Height (feet)	Change
Open bus switch rack, 35 kV, 7 bay with seven 35 kV, 600-A, 40 kVA INT, circuit breakers, insulators, switches, and bus work (1 bay for SunCatchers and 6 for PV)	6	1	105	20	30	Quantity Reduced
Shunt capacitor bank, 34.5 kV, 90 MVAR switched in six each 15 MVAR steps	6	1	15	8	20	Quantity Reduced
DVAR compensation system in coordination with shunt capacitor banks – size to be determined by studies	1	1	60	12	16	None
Disconnect switch, 35 kV, 3,000 A, 200 kV BIL, group-operated	6	1	3	11	16	Quantity Reduced
Power transformer, three phase, 100/133/167 MVA, 230/132.8-34.5/19.9 kV, 750 kV BIL, oil filled	6	6	15	35	23	None
Power circuit breaker, 242 kV, 2000A, 40 kA interrupting capacity	7	6	12	20	16	Quantity Reduced
Coupling capacitor voltage transformer for metering, 242 kV, 900 kV BIL, 60 Hertz, Potential Transformer ratio 1,200/2,000:1	6	1	1	1	25	Quantity Reduced
Disconnect switch, 242 kV, 1000 A	9	2	10	25	25	Quantity Reduced
230 kV dead-end structure	1	1	--	100	90	Specified

Notes:

1 = The Commission Decision reflected discrepancies in these numbers. These numbers have been correct here for consistency.

A = ampere (amp), BIL = basic impulse level, DVAR = Dynamic VAR, gpd = gallon per day, generator step-up unit (GSU), HP = horsepower, Hz = hertz, INT = international, kA = kilo amps, kV = kilovolt, kVA = kilovolt amps, Kvar = kilo amp reactive, kW = kilowatt, kWe = kilowatt-electric, MVA = megavolt amps, MVAR = megavolt amp reactive, MW = megawatts, QTY = quantity, V = volts, VAR = volt amp reactive, W = watts, -- = not applicable

2.3.3 Site Grading and Drainage

The following paragraphs describe the site grading and drainage required under the Approved Project and grading and drainage requirements proposed for the Modified Project.

2.3.3.1 Site Grading and Drainage Permitted under Approved Project

The Commission Decision for the Approved Project addressed site preparation parameters, including brush trimming, blading, grading and other ground disturbance. As approved by the Commission, brush trimming would be conducted between alternating rows of SunCatchers and would consist of cutting the top of the existing brush while leaving the existing native plant root system in place to minimize soil erosion. The trimming would occur prior to construction and would be done to a minimum height of 3 inches above ground. During operation, natural vegetation would be trimmed in the area of each SunCatcher (to minimize shading on SunCatchers and prevent potential brush fire hazards), as well as on either side of the surface-treated arterial roadways. After brush is trimmed, blading for roadways and foundations would be conducted between alternating rows to provide access to individual SunCatchers. Although ground disturbance would be minimized wherever possible, Calico Solar would remove localized rises or depressions within the individual 1.5 MW solar groups to provide for proper alignment and operation of the individual SunCatchers. The paved main access road and other surface-treated roads (access roads and SunCatcher maintenance roads) would be constructed as close to the existing topography as possible, with limited cut-and-fill operations to maintain roadway design slope to within a maximum of 10 percent

The Approved Project was designed to maintain the local predevelopment drainage patterns where feasible, and water discharge from the site would remain at the southern and western boundaries. The roadways would have a low-flow swale or roadway dip as needed to convey nuisance runoff to existing drainage channels. It is expected that storm water runoff would flow over the crown of the paved roadways, which are typically less than 6 inches from swale flow line, to crown at the centerline of the roadway, thus maintaining existing local drainage patterns during storms. Calico Solar proposed that low-flow culverts would be used on emergency access routes and all other roads would be at grade.

2.3.3.2 Modifications to Site Grading and Drainage

Except for the initial pre-construction brush trimming (described below), the site preparation and maintenance parameters for the Modified Project, including operational brush trimming, blading, grading and other ground disturbance, would create no greater disturbance than would the Approved Project. Site grading and drainage for the Modified Project would be consistent with the permitted methodology described in the Approved Project and would meet the same standards set for the Approved Project.

The site preparation parameters for the SunCatcher area would not change. Prior to construction of the PV portion of each phase of the Modified Project, the brush would be trimmed to a minimum height of 3 inches above ground, leaving the existing native plant root system in place to minimize soil erosion. After this initial trimming, the areas between PV rows would alternate between undisturbed areas and areas to be used as unimproved module access points, which would be accessed up to four times a year.

Installation of the PV Tracker Blocks would be completed in such a way as to minimize the need for site grading and would not be more than was contemplated under the Approved Project.

Under the Modified Project, the proposed design, grading, and treatment methods proposed for the paved main access road and other surface-treated roads (access roads and SunCatcher maintenance roads) would not change. However, in the Modified Project, the number of SunCatcher maintenance roads will be reduced proportionate to the reduction in SunCatchers. These surface-treated roads would be replaced in the Modified Project with unimproved module access points. The areas developed using PV technology have surface-treated access roads where inverter pads are located. All other access to the PV technology would be via unimproved module access points. Areas between PV tracker block rows will alternate between undisturbed areas and unimproved module access points.

2.3.4 Buildings

The following sections describe the buildings that would be associated with the Approved Project and those required under the Modified Project.

2.3.4.1 Approved Project Buildings

The main services complex in the Approved Project would consist of the administrative building, the maintenance building, and the assembly building. It would be located within Phase 1a of the site in a central location that provided for efficient access routes for maintenance vehicles servicing the SunCatcher solar field. The main services complex would cover approximately 50 acres.

The Approved Project's maintenance building includes maintenance facilities, shop, and warehouse storage areas would be adjoined to the administration building. The assembly buildings would be located beside the administrative building. Assembly buildings would be decommissioned after the SunCatchers were assembled and installed. Transport trailer storage would be located adjacent to the assembly buildings. The storage area would allow the Approved Project to maintain a supply of 3 to 5 days of inventory of SunCatcher parts during the assembly phase of construction.

Electric service for the main services complex would be obtained from SCE. Electric power would be provided via an SCE overhead distribution line located on the north side of Interstate 40 (I-40). Communications service would be provided by the local phone company via an overhead service line extending from existing underground communications lines located on the north side of I-40.

The administration building, maintenance building, and other features would be manufactured buildings painted with a matching desert sand color identified as "Carlsbad Canyon." The water treatment building and the water holding tanks, including the potable water, raw water, and demineralized/fire protection water tanks located at the main services complex, would also be painted with Carlsbad Canyon.

The exterior material for the assembly buildings would be a fire retardant vinyl fluoride film with ultraviolet blocking characteristics, and would be chemical and weather resistant. As approved by the BLM and Commission, the exteriors would be painted Carlsbad Canyon to match the other structures.

2.3.4.2 Modified Project Buildings

Under the Modified Project, the main services complex would be relocated within the Project site in the new location of Phase 1, south of the railroad, in a central location that provides for efficient access routes for maintenance vehicles servicing the entire solar field. The locations of the buildings within the main services complex would be reconfigured (Figure 2-5); however, the size, design, and functionality of the buildings would remain the same in the Modified Project as under the Approved Project.

2.3.5 Water Supply and Treatment

The following sections describe the water supply and treatment systems that would be associated with the Approved Project and those required under the Modified Project.

2.3.5.1 Approved Project Water Supply and Treatment Systems

The following types of water would be required for the Approved Project: equipment wash water, potable water, dust control water, and fire protection water. The Approved Project is permitted to use 145 acre-feet per year of water during construction and 21 acre-feet of raw water per year under normal operation (inclusive of mirror cleaning, dust control, and potable water usage). Raw water would be pumped from a local well on private property owned by Calico Solar and delivered to a storage tank in the main services complex. Water would be transported from the well to the main services complex via a 0.51-mile-long, 6- to 8-inch-diameter waterline. The main services complex, in the Approved Project, would include a location for an approximately 230,000-gallon tank that would be used to store water for SunCatcher mirror washing and fire protection applications. Emergency water could be trucked in from local municipalities. This volume of water would meet all LORS, including fire protection water for the San Bernardino County Fire District and Harvard Station 46 (a San Bernardino County Fire District-staffed station).

Potable water to meet plant requirements would be obtained from treated groundwater. The groundwater would first be demineralized, then stored in a designated storage facility equipped with chemical dosage for disinfection. This treated potable water would be available at the main services complex.

2.3.5.2 Modified Project Water Supply and Treatment Systems

The water usage rates for the operations phase of the Project would not increase under the Modified Project. Water usage requirements would be reduced slightly, as shown in Table 2-2, and would conform to the usage limits of the Approved Project. The length of the water line would increase from 0.51 mile to 1.55 miles and would be constructed under the railroad using jack and bore techniques.

Table 2-2
Water Usage Rates for Facility Operation under Modified Project

Water Use	Daily Average (gallons per minute)	Daily Maximum (gallons per minute)	Annual Usage (acre feet)
Equipment Water Requirements			
SunCatcher Mirror Washing	1.6	5.7	2.2
Photovoltaic Module Washing	4.2	14.9	5.8
Water Treatment System Discharge			
Brine to Evaporation Ponds	2.3	12.8	3.9
Potable Water Use			
Drinking and Sanitary Water Requirements	2.0	4.4	1.7
Dust Control			
Well Water for Dust Control during Operations	4.5	15.8	6.1
Hydrogen Production Plant			
Water to Produce Hydrogen for SunCatchers	0.02	0. 06	0.025
Totals	14.62	53.66	19.725

2.3.6 Wastewater and Waste Management

The following sections describe the wastewater and waste management systems that would be associated with the Approved Project and the Modified Project.

2.3.6.1 Approved Project Wastewater and Waste Management Systems

Under the Approved Project, the wastewater generated by the reverse osmosis (RO) unit would contain relatively high concentrations of total dissolved solids (TDS). Wastewater or brine generated by the RO unit would be discharged to two lined concrete evaporation ponds that would meet the requirements of the California Regional Water Quality Control Board, Lahontan Region (RWQCB). Each pond would be sized to contain 1 year of discharge flow, approximately 2.44 million gallons. The second pond would be in operation while the first is undergoing evaporation. The functions of the two ponds would alternate on an annual basis.

After the brine has gone through the evaporation process, the solids that settle at the bottom of the evaporation pond would be tested by Calico Solar and disposed of at an appropriate non-hazardous waste disposal facility. In order to achieve maximum solids removal, the solids would be scheduled for removal during the summer months when the concentration of solids is at its greatest due to an increase in evaporation rates.

Sanitary wastewater generated at the facility cannot be conveyed to an existing sewage facility or pipeline as there are no public or private entities that manage sanitary wastewater flows for locations in the vicinity of the Project site. The wastewater generated at the main services complex would be discharged into a subsurface wastewater disposal system consisting of septic tanks and leach fields, located within the main services complex. The wastewater disposal system would be designed in accordance with the applicable LORS, including those of San Bernardino County, the RWQCB, and the California Department of Health Services.

The expected daily sanitary wastewater flow from the Approved Project ranges from an average of 5,500 gallons to a peak of 6,600 gallons per day. The RWQCB requires a set aside area of approximately 14 acres given this flow. Given that the Approved Project's set aside area is much greater than 14 acres, the threshold limit for septic tank and leach field applications would be met. The required leach field area is estimated to be approximately 1,100 square feet (0.025 acre).

2.3.6.2 Modified Project Wastewater and Waste Management Systems

Under the Modified Project, the wastewater discharge would be reduced. Demineralized water, which is required for PV module and SunCatcher washing, would be reduced because PV modules require washing on a less frequent basis than SunCatchers. Reduced demineralization results in commensurate reduction in demineralization wastewater. Sanitary wastewater would be reduced due to the reduction in workforce. Otherwise, handling and treatment of wastewater under the Modified Project would be the same as under the Approved Project.

2.3.7 Hazardous Waste Management

The following sections describe the hazardous waste management programs that would be associated with the Approved Project and the Modified Project.

2.3.7.1 Approved Project Hazardous Waste Management Program

Hazardous materials used during construction and operation of the Approved Project would include hydrogen (see Section 2.3.8 below), paints, epoxies, grease, transformer oil, caustic electrolytes (battery fluid), and products that would be generated by the construction equipment, such as waste fuel and waste oil. Several methods would be used to properly manage and dispose of hazardous materials and wastes. Waste lubricating oil would be recovered and recycled by a waste oil recycling contractor. Chemicals would be stored in appropriate chemical storage facilities. Bulk chemicals would be stored in large storage tanks, while most other chemicals would be stored in smaller returnable delivery containers. All chemical storage areas would be designed with concrete containment areas to contain leaks and spills and would meet all applicable LORS.

2.3.7.2 Modified Project Hazardous Waste Management Program

Hazardous waste management methods would not change under the Modified Project. Quantities of hazardous materials associated with SunCatcher operation would be comparably reduced. No additional hazardous waste would be generated from the added PV technology.

2.3.8 Hydrogen System

The following sections describe the hydrogen systems that would be associated with the Approved Project and the Modified Project.

2.3.8.1 Approved Project Hydrogen System

Each SunCatcher unit relies on hydrogen gas to convert solar thermal energy to mechanical and then to electrical energy. The hydrogen system permitted under the Approved Project included two on-site hydrogen generators (one located north and the other south of the BNSF railroad) that produce hydrogen through the electrolysis of water and two hydrogen storage tanks. Calico Solar would be allowed to use either a distributed or a centralized hydrogen system.

Under the distributed system, each SunCatcher would be equipped with a 196-standard cubic foot (scf) k-bottle[3] that would replenish hydrogen gas lost within the gas circuit. Hydrogen would be obtained from the hydrogen storage tank and transported to each individual SunCatcher using trucks. Each SunCatcher would include an 82-scf high-pressure supply tank, 28-scf low-pressure dump tank, and a 489-scf local storage tank. In addition, each SunCatcher unit would contain a minimum of 11 scf of hydrogen at 580 pounds per square inch (psi) at all times, resulting in a total of around 610 scf of hydrogen in each SunCatcher. The k-bottles would be transported to each SunCatcher during the mirror-washing truck trips. Hydrogen refilling and replacement trips would be expected to occur approximately three times per year.

For the centralized system, hydrogen would be distributed from the hydrogen storage tanks to 95 individual compressor groups. Each compressor group would be electrically operated and would consist of a compressor and a high-pressure supply tank with a 29,333-scf capacity, delivering gas at approximately 2,760 psi. Each compressor group would also be equipped with a low-pressure dump tank with the same 9,900-scf capacity used to recover hydrogen from non-operational PCUs through a 1⁄4-inch and 1⁄2-inch stainless steel return line. In this option, there would be no other holding tanks or storage tanks in the compressor groups. Delivery of hydrogen throughout the system would be through pipelines.

2.3.8.2 Modified Project Hydrogen System

The Modified Project would use fewer SunCatchers for electrical generation, which would reduce the amount of hydrogen required on site. The Modified Project would eliminate the hydrogen generator and storage tank located south of the railroad, and the hydrogen generator and the storage tank north of the railroad would be located within the SunCatcher area. The Modified Project would also reduce the total number of compressor groups from 95 to approximately 12. The proposed methods of delivering the hydrogen to the system would not be changed but would result either in fewer k-bottles on site under the distributed system or a reduction in the length of piping under the centralized system. Total hydrogen on site would be reduced from 23,000 pounds to 2,760 pounds for the centralized system and from 116,000 pounds to 13,392 pounds for the distributed system.

[3] A k-bottle is a bottle of compressed gas. The “k” references a specific wet volume of 49.9 liters.

Calico Solar is continuing to evaluate the relative advantages between the centralized hydrogen distribution system and a distributed system that utilizes k-bottles on the PCUs of all SunCatchers.

2.3.9 Transmission System Interconnection and Upgrades

The following sections describe the transmission system interconnections and upgrades that would be associated with the Approved Project and the Modified Project.

2.3.9.1 Approved Project Transmission System Interconnection and Upgrades

The Approved Project would include the construction of a new 230 kV substation approximately in the center of the Project site, north of the railroad. The Approved Project substation would consist of an open air bus with 15 35 kV collection feeder circuit breakers. Each feeder breaker would be connected to one of the 48 MW or 51 MW overhead collection lines. Additional 35 kV circuit breakers would connect to power factor correction capacitor banks located in the substation yard. This new substation would be connected to the existing SCE Pisgah Substation via an approximately 2-mile-long, single-circuit, 230 kV transmission line. Other than this interconnection transmission line, no new transmission lines or off-site substations would be required for construction of Phase 1.

Provisions would be made to expand the on-site substation from 275 MW to 663.5 MW with the addition of three power transformers in Phase 2 of the Approved Project. Control, metering, and protection systems for the line, substation, and collection systems would be located within the main services complex. The on-site portion of the interconnection transmission line would be installed in a 100-foot-wide ROW from the on-site substation southeast to the point of intersection with the SCE transmission ROW, then southwest to parallel the transmission ROW to the Pisgah Substation.

The approximately 12 to 15 transmission line towers would consist of H-Frame towers at the undercrossing of the existing 500 kV transmission line and lattice steel towers and/or steel posts elsewhere. The overhead 230 kV transmission line would be constructed with one 1,590 kilo circular mils/phase, aluminum steel-reinforced conductor per line, each thermally rated to carry full Project output in emergency conditions and one-half of full Project output in normal conditions. Two fiber optic cables would be provided for communication with SCE and the CAISO.

2.3.9.2 Modified Project Transmission System Interconnection and Upgrades

The Modified Project changes would involve relocating the on-site substation south of the railroad on the eastern side of the new Phase 1 area, adjacent to the Pisgah substation. The layout of the planned on-site substation would not change. The single-circuit transmission line between the on-site substation and Pisgah Substation would be reduced to approximately 500 feet in length, requiring only up to three towers. Otherwise, the transmission system interconnection for the Modified Project would be the same as for the Approved Project.

2.4 FACILITY CLOSURE

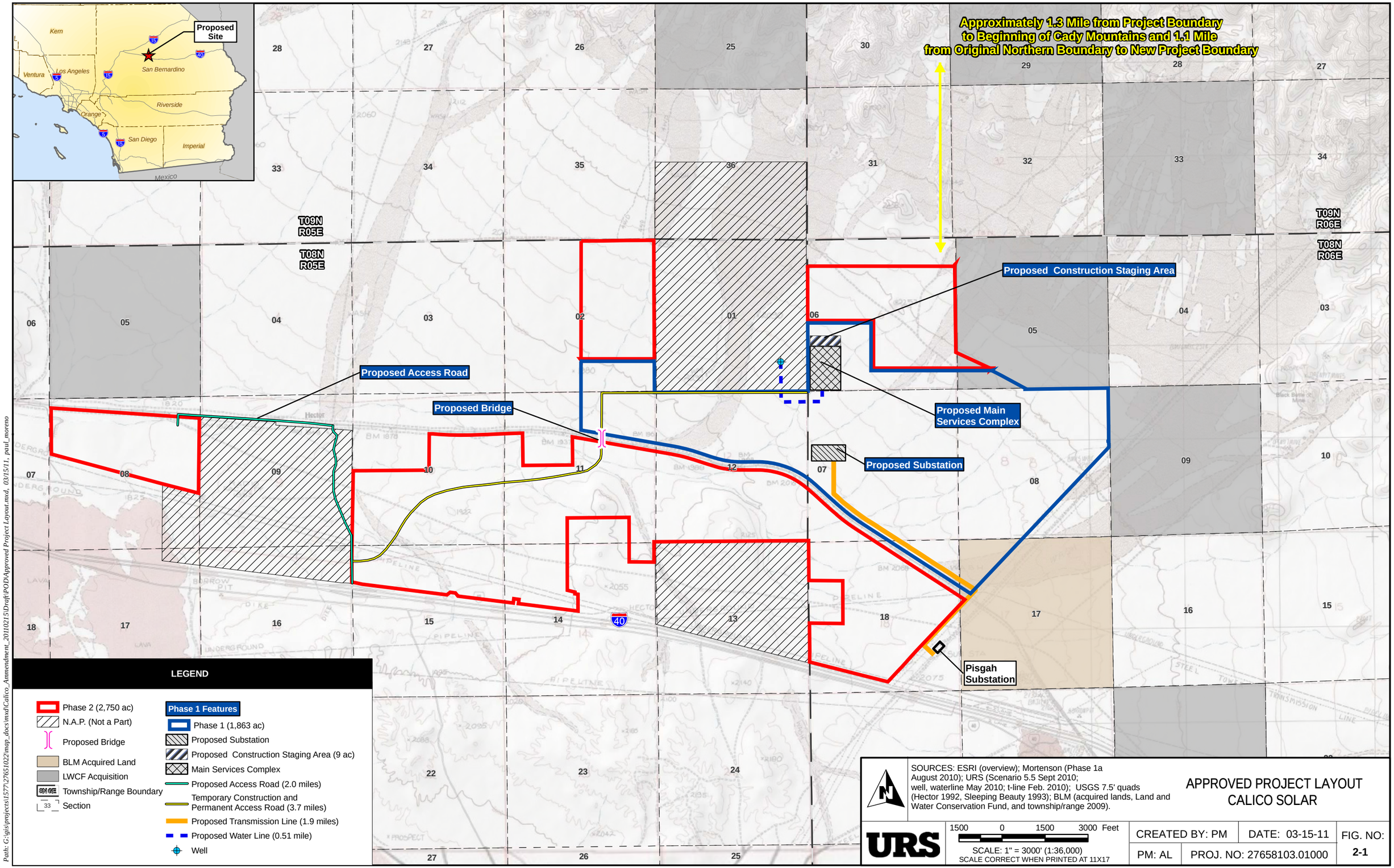
The following sections describe the facility closure activities that would be associated with the Approved Project and the Modified Project.

2.4.1 Approved Project Facility Closure

Permanent closure of the Approved Project was defined as a cessation in operations with no intent to restart operations owing to Project age, damage to the Approved Project that is beyond repair, adverse economic conditions, or other significant reasons. The Commission Decision requires decommissioning to be performed in accordance with plans and mitigation measures that would assure that the Approved Project would conform to applicable LORS and would avoid significant adverse impacts. The Approved Project would be bonded in a manner consistent with agency policy.

2.4.2 Modified Project Facility Closure

Under the Modified Project, the standards applied to the closure of the facility would not be different than those of the Approved Project.



APPROVED PROJECT LAYOUT
CALICO SOLAR

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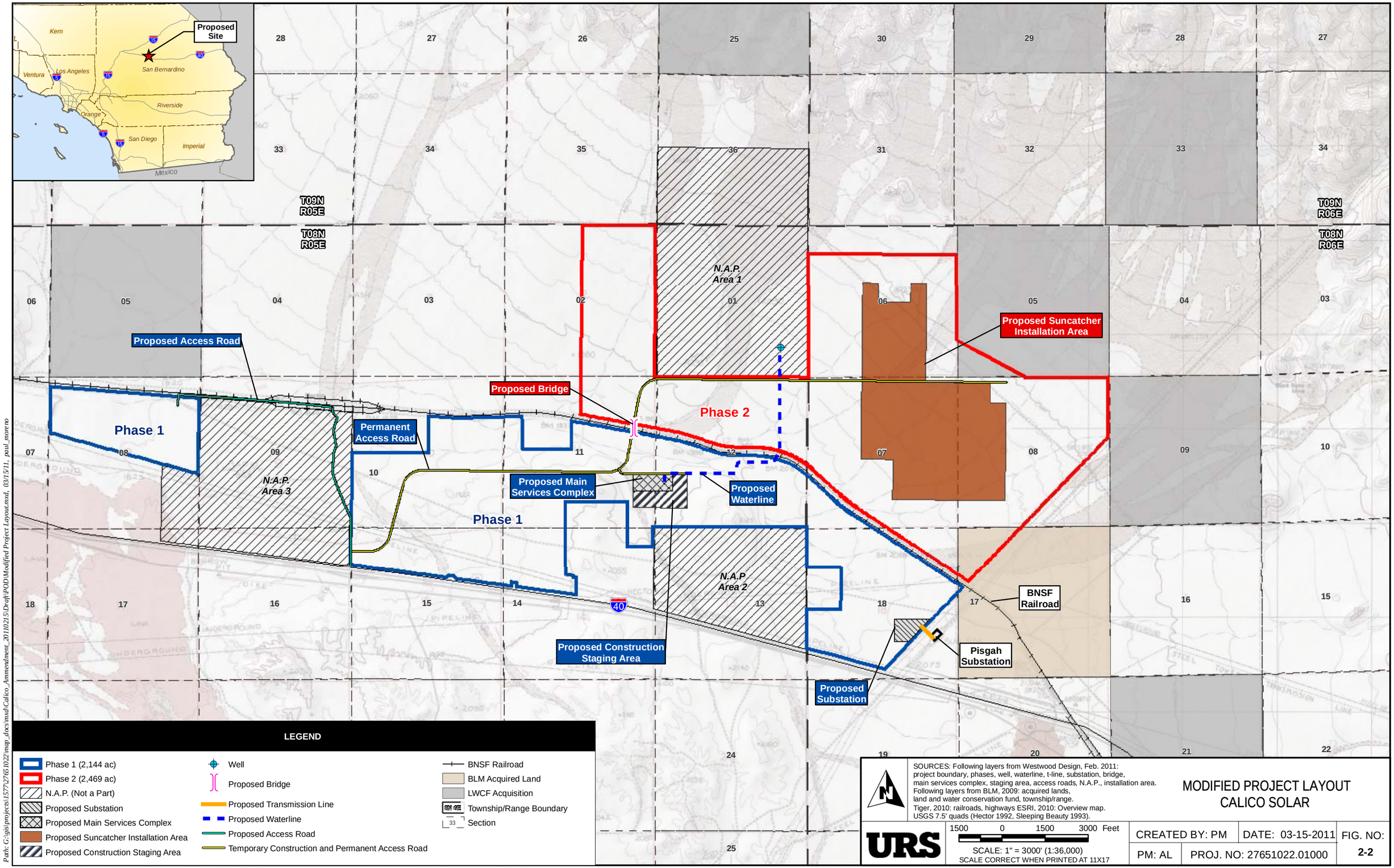

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Site Plan

for

Solar Development with PV Module Technology

for

Calico Solar Restricted Build Plan

San Bernardino County, California

Solar Module Build Out		SunCatcher Buildout
MW South of BNSF Railway	275.0 MW AC	0
MW North of BNSF Railway	288.0 MW AC	100.5 MW AC
Total	563.0 MW AC	100.5 MW AC

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Sheet Number	Sheet Title
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15	CIVIL PLAN 8
16	CIVIL PLAN 9
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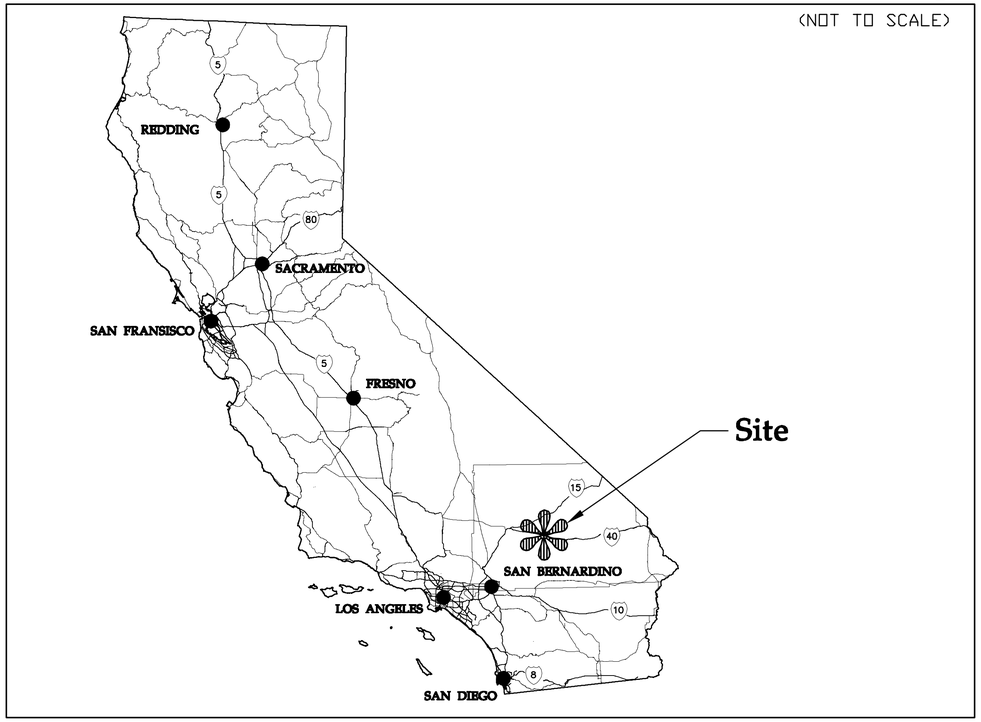
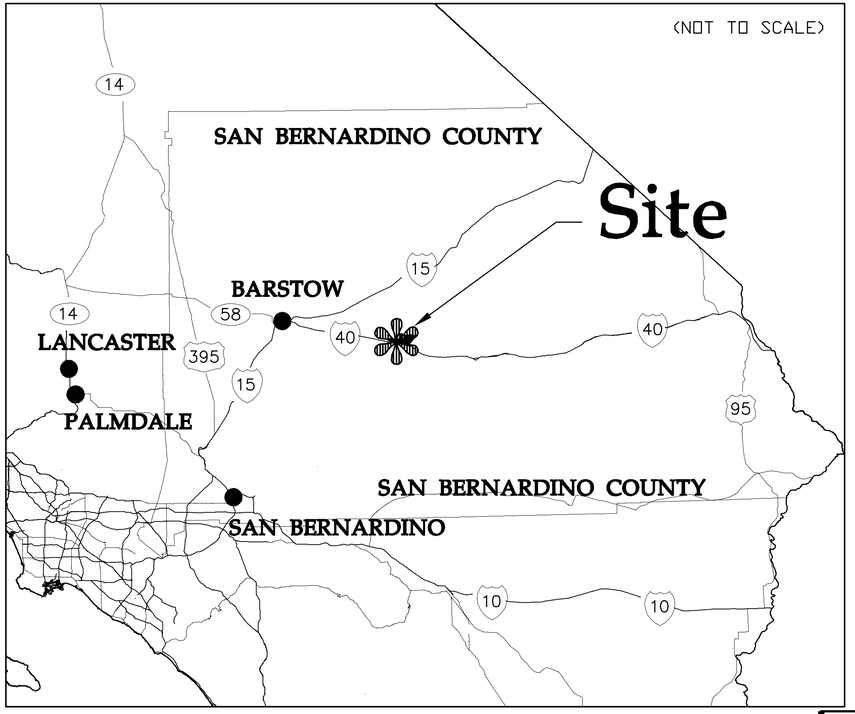
19	CIVIL PLAN 12

State Map



Vicinity Map



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Revisions:

Designed: ADC
Checked: DDB
Drawn: ADC
Record Drawing by/date:

Prepared for:

kRoad
2600 10th Street
Suite 635
Berkeley, CA 94710

Calico Solar

San Bernardino County, California

Date: 02/21/11 Sheet: 1 OF 19

Cover

Figure 2-3a

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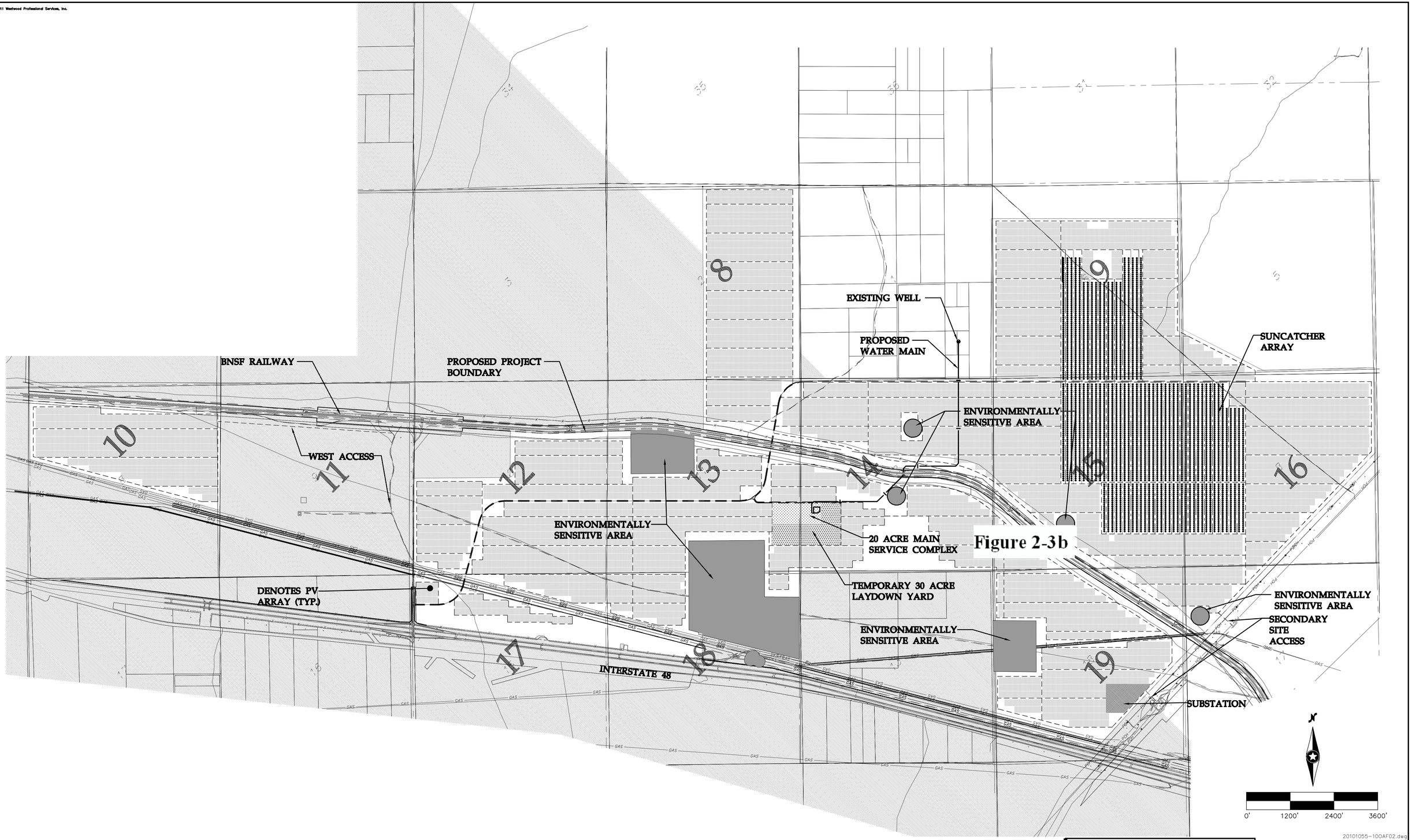

Figure 2-3b

Date: 02/23/11 Sheet: 2 OF 19

Calico Solar

San Bernardino County, California

Overall

Figure 2-3b

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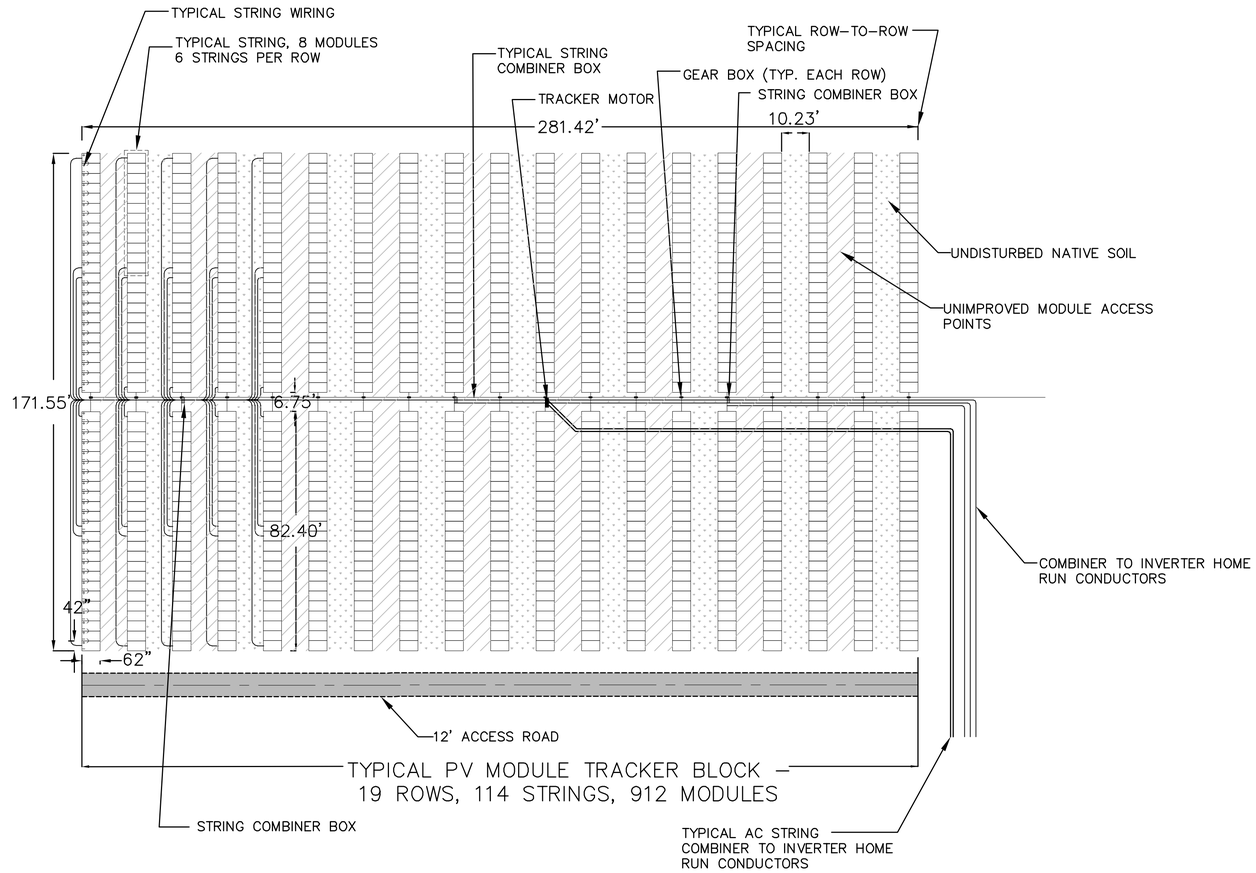
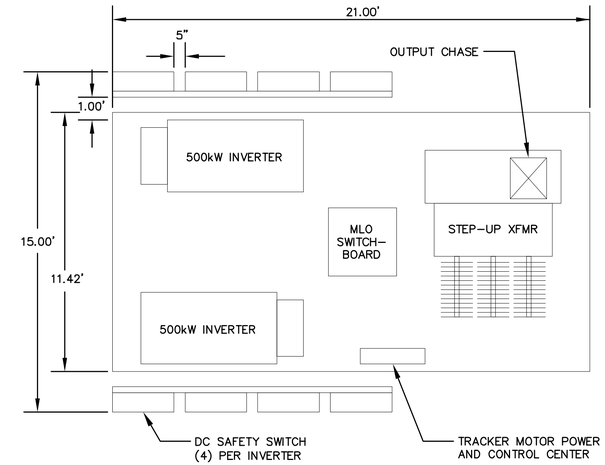
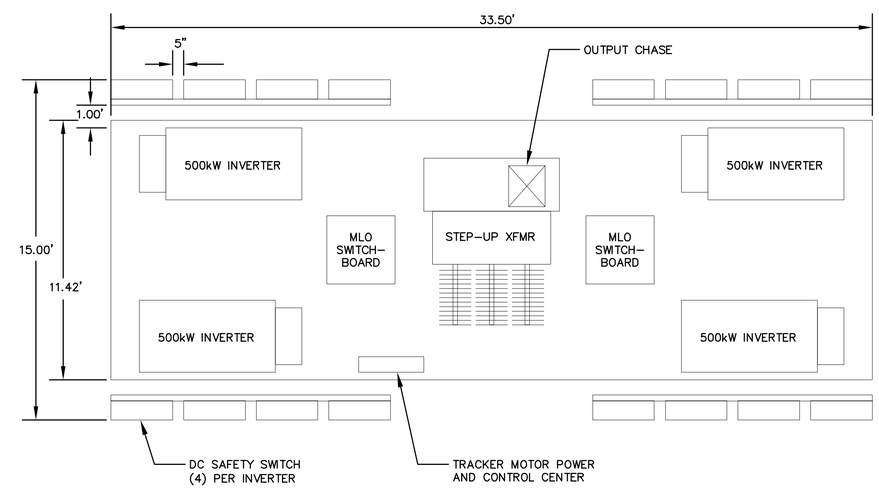




TYPICAL 1MW INVERTER STATION



TYPICAL 2MW INVERTER STATION

Total Disturbance North of BNSF Railway	Acres
Total Site Area	2473
Modules	516.3
Main Site Access Road	37.8
Access Road	87.5
Inverters	3.8
SunCatchers	454.4
SunCatcher Maintenance Road	28.4
Unimproved Module Access Points	516.9
Total Disturbed Area	1645.1

Total Disturbance South of BNSF Railway	Acres
Total Site Area	2140
Modules	475.5
Main Site Access Road	42.2
Access Road	104.3
Inverters	3.6
Unimproved Module Access Points	476.1
Main Service Complex	20.0
Laydown/Storage Area	30.0
Substation	15.5
Total Disturbed Area	1167.2

Waters of the State Disturbance North of BNSF Railway	Acres
Main Site Access Road	0.7
Access Road	2.4
SunCatcher Maintenance Road	1.0
Perimeter Access Road	0.6
PV Module	16.7
Unimproved Access Point	19.9
SunCatcher Unit	17.5
Inverter Pad	0.1
Total Disturbed Area	58.9

Waters of the State Disturbance South of BNSF Railway	Acres
Main Site Access Road	1.3
Access Road	2.4
Perimeter Access Road	0.9
PV Module	10.9
Unimproved Access Point	13.0
Inverter Pad	0.1
Temporary Ladown Yard	1.6
Substation	1.1
Total Disturbed Area	31.3

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Date: 02/23/11 Sheet: 3 OF 19

Calico Solar

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Construction Details

Figure 2-3c

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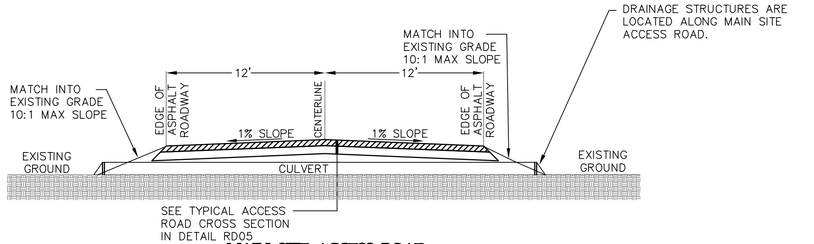
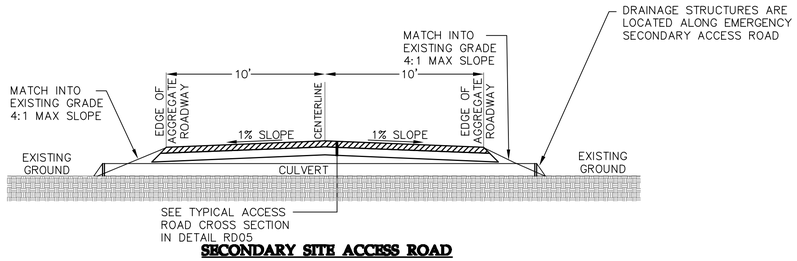
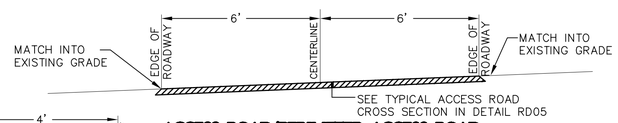


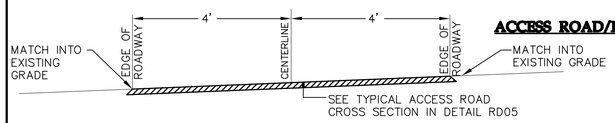
MAIN SITE ACCESS ROAD



SECONDARY SITE ACCESS ROAD



ACCESS ROAD/PERIMETER ACCESS ROAD



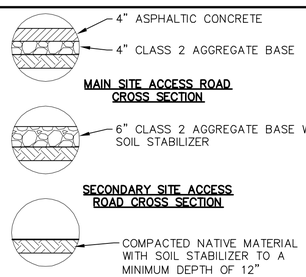
SUNCATCHER MAINTENANCE ROAD

Road Type	Minimum Radii
Access Road	75 ft.
Secondary Site Access	75 ft.
Perimeter Access Road	75 ft.
Suncatcher Main Road	50 ft.
Perimeter Road	50 ft.

NOTES:

1. MAIN SITE ACCESS/EMERGENCY ROUTE SHALL BE CONSTRUCTED TO BE ELEVATED ABOVE THE 100-YEAR FLOOD PLAIN ELEVATION.
2. ACCESS ROADS AND SUNCATCHER MAINTENANCE ROADS SHALL BE CONSTRUCTED TO MATCH PRE-CONSTRUCTION ELEVATIONS, ALLOWING THE NATURAL DRAINAGE TO FLOW THROUGH THE SITE UNIMPEDED.

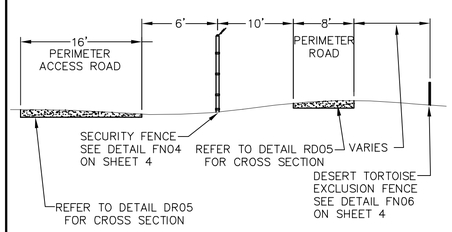
Westwood | TYPICAL ACCESS ROAD | LAST REVISED: 06/22/10 | RD01



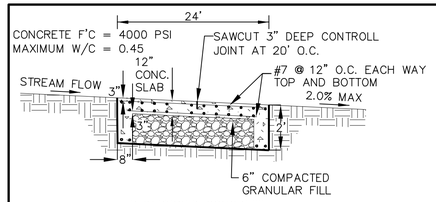
NOTE:

1. AGGREGATE BASE SHALL BE 1½" MINUS CLASS 2 IN CONFORMANCE WITH THE STATE OF CALIFORNIA STANDARD SPECIFICATIONS SECTION 26-102.A.
2. SOIL STABILIZER SHALL BE "TRANS/SEAL 1" BY FLUIDTECH, A DIVISION OF IMPACT SERVICES, INC. OR APPROVED EQUAL.
3. SEE CONSTRUCTION NOTES AND GEOTECHNICAL REPORT FOR SUBGRADE PREPARATION AND COMPACTION REQUIREMENT.

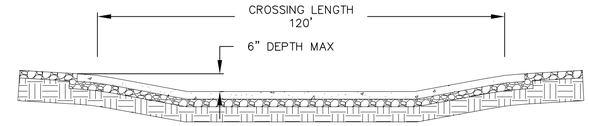
Westwood | TYPICAL STRUCTURAL CROSS SECTIONS | LAST REVISED: 06/22/10 | RD05



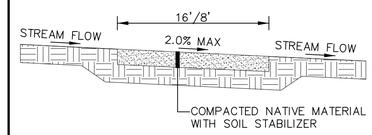
Westwood | TYPICAL PERIMETER ACCESS ROAD AND FENCE ORIENTATION | LAST REVISED: 06/22/10 | RD25



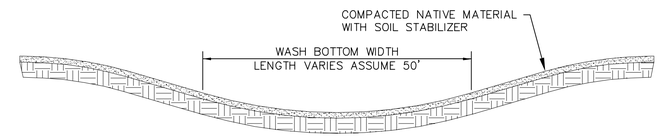
REINFORCED CONCRETE CROSS SECTION FOR MAIN SITE ACCESS ROAD



REINFORCED CONCRETE CROSSING PROFILE FOR MAIN SITE ACCESS ROAD



AT-GRADE CROSS SECTION FOR ACCESS ROADS/SUNCATCHER MAINTENANCE ROADS

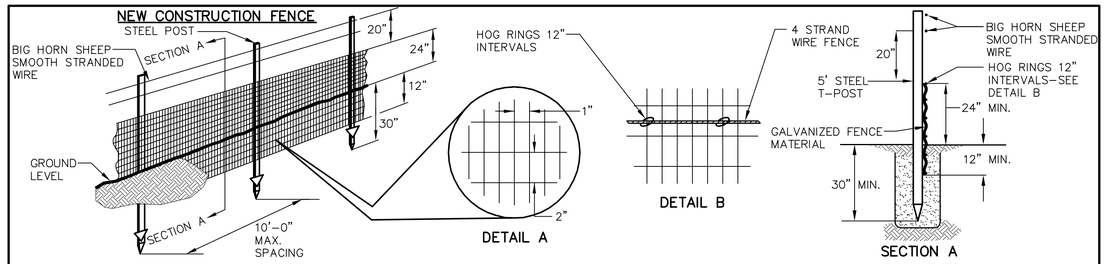


AT-GRADE CROSSING PROFILE FOR ACCESS ROADS/SUNCATCHER MAINTENANCE ROADS

NOTE:

1. CROSS SLOPE SHALL NOT BE GRATER THAN 2%
2. OUTER TOP AND BOTTOM MAT TO RUN PARALLEL WITH DIRECTION OF TRAFFIC

Westwood | TYPICAL ROAD ARIZONA STYLE CROSSING | LAST REVISED: 01/12/10 | RD19



NOTE:

1. FENCES SHOULD BE CONSTRUCTED WITH DURABLE MATERIALS (I.E. 16 GAUGE OR HEAVIER) SUITABLE TO RESIST DESERT ENVIRONMENTS, ALKALINE AND ACIDIC SOILS, WIND AND EROSION.
2. FENCE MATERIALS SHOULD CONSIST OF 1 INCH HORIZONTAL BY 2 INCH VERTICAL, GALVANIZED WELDED WIRE, 36 INCHES IN WIDTH.
3. DESERT TORTOISE FENCE SHALL BE INSTALLED ALONG WITH THE INSTALLATION OF THE SECURITY CHAIN LINK FENCE.
4. IF TORTOISE FENCE IS TO BE CONSTRUCTED IN AREAS WHERE THERE IS NO SECURITY CHAIN LINK FENCE, STEEL T-POSTS SHALL BE INSTALLED AT A 10 FOOT INTERVAL SPACING, AND LIVE STOCK WIRE SHOULD BE STRETCHED BETWEEN THE T-POSTS 18 TO 24 INCHES ABOVE THE GROUND TO MATCH THE TOP EDGE OF THE FENCE MATERIAL.
5. IF THE FENCE IS CONSTRUCTED WITHIN THE RANGE OF BIG HORN SHEEP, THE 5' STEEL POST SHALL BE REPLACED WITH AN 8' STEEL POST, TWO SMOOTH STRANDED WIRES ARE REQUIRED AT THE TOP OF THE T-POST, APPROXIMATELY 4 INCHES APART, A 20-24 INCH GAP MUST EXIST BETWEEN THE TOP OF THE FENCE MATERIAL AND THE LOWEST SMOOTH STRAND WIRE AT THE TOP OF THE T-POST.
6. ENSURE THAT THE HEIGHT OF THE TORTOISE FENCE ABOVE GROUND LEVEL IS NO LESS THAN 18 INCHES AND NO HIGHER THAN 24 INCHES.
7. ENSURE THAT THE DEPTH OF FENCE MATERIAL BELOW GROUND LEVEL IS 12 INCHES. (SEE SECTION A)
8. BACKFILL TRENCHES WITH EXCAVATED MATERIAL FREE OF DEBRIS AND COMPACT THE MATERIAL TO 90% STANDARD PROCTOR.
9. SUBSTITUTE SMOOTH WIRE FOR BARBED WIRE IF ADDITIONAL SUPPORT WIRES ARE NECESSARY.
10. THE NUMBER AND PLACEMENT OF SUPPORT WIRES MAY BE MODIFIED TO ALLOW SHEEP AND DEER TO PASS SAFELY.
11. IF EROSION AT THE EDGE OF THE FENCE MATERIAL, WHERE THE FENCE CROSSES WASHES, OCCURS APPROPRIATE AND TIMELY MONITORING AND REPAIRS WELL BE CONDUCTED.
12. TIE THE FENCE INTO EXISTING CULVERTS AND CATTLE GUARDS WHEN DETERMINED NECESSARY TO ALLOW DESERT TORTOISE PASSAGE UNDERNEATH ROADWAYS.
13. INSPECTION AND MAINTENANCE OF THE TORTOISE FENCE SHALL OCCUR AT REGULAR INTERVALS, ESPECIALLY DURING PERIODS OF PRECIPITATION WHERE TORTOISE MOVEMENT IS GREATER.
14. ALL DESERT TORTOISE FENCES AND CATTLE GUARDS SHOULD BE INSPECTED ON A REGULAR BASIS SUFFICIENT TO MAINTAIN AN EFFECTIVE BARRIER TO TORTOISE MOVEMENT. INSPECTIONS SHOULD BE DOCUMENTED IN WRITING AND INCLUDE AN OBSERVATION OF ENTRAPPED ANIMALS; REPAIRS NEEDED INCLUDING BENT T-POSTS, LEANING OR NON-PREPENDICULAR FENCING, CUTS, BREAKS, AND GAPS; CATTLE GUARDS WITHOUT ESCAPE PATHS FOR TORTOISES OR NEEDED MAINTENANCE; TORTOISE AND TORTOISE BURROWS INCLUDING CARCASSES; AND RECOMMENDATIONS FOR SUPPLIES AND EQUIPMENT NEEDS TO COMPLETE REPAIRS AND MAINTENANCE.
15. ALL FENCE AND CATTLE GUARD INVENTORIES SHOULD BE INSPECTED AT LEAST TWICE PER YEAR DURING THE FIRST 2 TO 3 YEARS. IT IS RECOMMENDED THAT ALL INSPECTIONS WILL BE CONDUCTED QUARTERLY AT A MINIMUM, TO IDENTIFY AND DOCUMENT BREACHES, AND PROBLEM AREAS SUCH AS WASH-OUTS, VANDALISM, AND CATTLE GUARDS THAT FILL-IN WITH SOIL OR GRAVEL.
16. FOLLOWING 2 TO 3 YEARS OF INITIAL INSPECTION, SUBSEQUENT INSPECTIONS SHOULD FOCUS ON KNOWN PROBLEMS AREAS WHICH WILL BE INSPECTED MORE FREQUENTLY THAN TWICE PER YEAR. IN ADDITION TO SEMI-ANNUAL INSPECTIONS, PROBLEMS AREAS PRONE TO WASH-OUTS SHOULD BE INSPECTED FOLLOWING PRECIPITATION THAT PRODUCES POTENTIALLY FENCE DAMAGING WATER FLOW. IT IS SUGGESTED THAT A DATABASE OF PROBLEM AREAS BE ESTABLISHED WHEREBY CHECKING FENCES IN SUCH AREAS CAN BE DONE EFFICIENTLY.
17. ALL WORK MUST AND MATERIALS COMPLY WITH THE REQUIREMENTS OF THE U.S. FISH & WILDLIFE.
18. REPAIRS TO FENCING SHOULD BE ADDRESSED IN A TIMELY MANNER WHEN DISCOVERED.
    - 18.1. REPAIRS OF FENCE WASH-OUTS: A) REALIGN THE FENCE OUT OF THE WASH IF POSSIBLE TO AVOID THE PROBLEM AREAS, OR B) RECONSTRUCT TORTOISE PROOF FENCING USING TECHNIQUES THAT WILL ENSURE THAT AN EFFECTIVE DESERT TORTOISE BARRIER IS ESTABLISHED THAT WILL NOT REQUIRE FREQUENT REPAIRS AND MAINTENANCE.
    - 18.2. GAPS AND BREAKS WILL REQUIRE EITHER: A) REPAIRS TO THE EXISTING FENCE IN PLACE, WITH SIMILAR DIAMETER AND COMPOSITION OF ORIGINAL MATERIAL, B) REPLACEMENT OF THE DAMAGED SECTION TO THE NEAREST T-POST, WITH NEW FENCE MATERIAL THAT MEET ORIGINAL FENCE STANDARDS, C) BURY FENCE, AND/OR RESTORING ZERO GROUND CLEARANCE BY FILLING IN GAPS OR HOLES UNDER FENCE.
    - 18.3. ALL FENCE DAMAGES SHOULD BE REPAIRED IN A TIMELY MANNER TO ENSURE THAT TORTOISES DO NOT TRAVEL THROUGH DAMAGED SECTIONS. SIMILARLY, CATTLE GUARDS WILL BE CLEANED OUT OF DEPOSITED MATERIAL UNDERNEATH THEM IN A TIMELY MANNER. IN ADDITION TO PERIODIC INSPECTIONS, DEBRIS SHOULD BE REMOVED THAT ACCUMULATES ALONG THE FENCE.

Westwood | DESERT TORTOISE EXCLUSION FENCE | LAST REVISED: 01/12/10 | FN06

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Construction Details
Figure 2-3d

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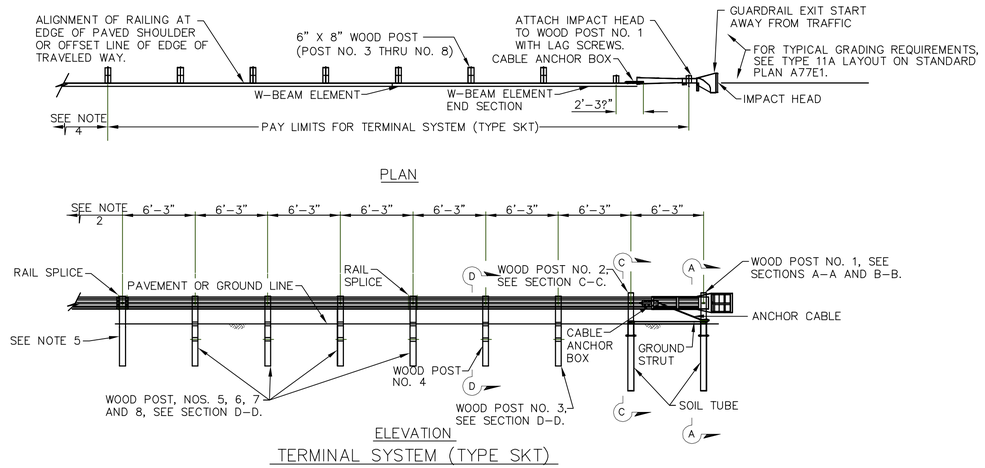
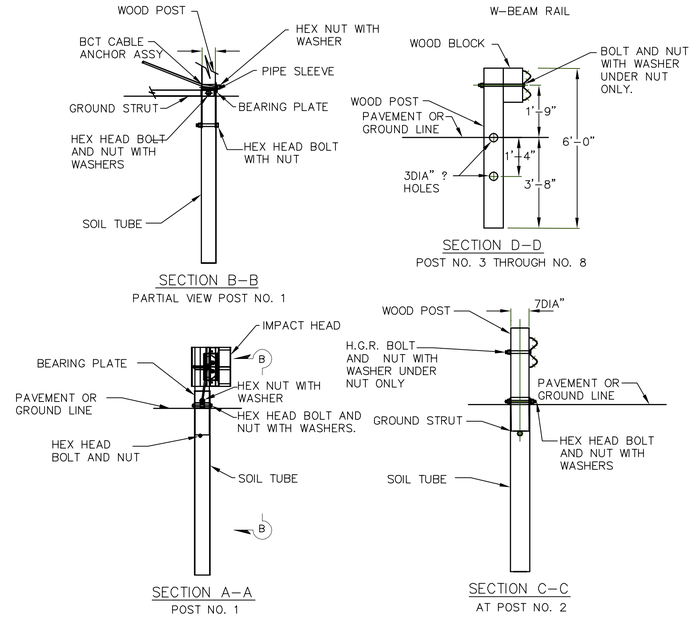


TERMINAL SYSTEM (TYPE SKT)



NOTES:

1. FOR ADDITIONAL DETAILS OF TERMINAL SYSTEM (TYPE SKT), REFER TO THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
2. TERMINAL SYSTEM (TYPE SKT) MUST BE CONSTRUCTED SO THAT THE FULL LENGTH OF THE TERMINAL SYSTEM GUARD RAILING IS IN STRAIGHT ALIGNMENT. TERMINAL SYSTEM (TYPE SKT) CAN BE FLARED AT A MAXIMUM RATE OF 25:1 TO PREVENT THE IMPACT HEAD FROM ENCROACHING ON THE SHOULDER. THE FLARE IS NOT REQUIRED AND MAY BE DECREASED OR ELIMINATED FOR SPECIFIC INSTALLATIONS.
3. TERMINAL SYSTEM (TYPE SKT) NOT TO BE USED WHERE EXTRUSION OF THE RAIL ON THE BACK SIDE OF THE INSTALLATION WOULD BE IN THE PATH OF PEDESTRIAN TRAFFIC OR WHERE THERE IS LESS THAN 25'-0" BETWEEN THE OUTLET SIDE OF THE IMPACTED HEAD AND ANY ADJACENT VEHICLE TRAFFIC.
4. FOR THE LENGTH AND TYPE OF METAL BEAM GUARD RAILING FOR METAL BARRIER RAILING THE TERMINAL SYSTEM IS TO ATTACHED TO, SEE PROJECT PLANS. FOR TYPICAL USE OF THIS TERMINAL SYSTEM WITH GUARD RAILING, SEE A77E, A77F, AND A77G SERIES OF THE STANDARD PLANS.
5. ATTACH RAIL ELEMENT TO THIS POST AND BLOCK. PAYMENT FOR THIS POST, BLOCK AND HARDWARE IS INCLUDED IN PAYMENT FOR THE TYPE OF RAILING OR BARRIER THE TERMINAL SYSTEM IS ATTACHED TO, NOT PART OF PAYMENT FOR TERMINAL SYSTEM (TYPE SKT)

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TYPICAL GUARD RAIL END TREATMENT

LAST REVISED: 07/30/10

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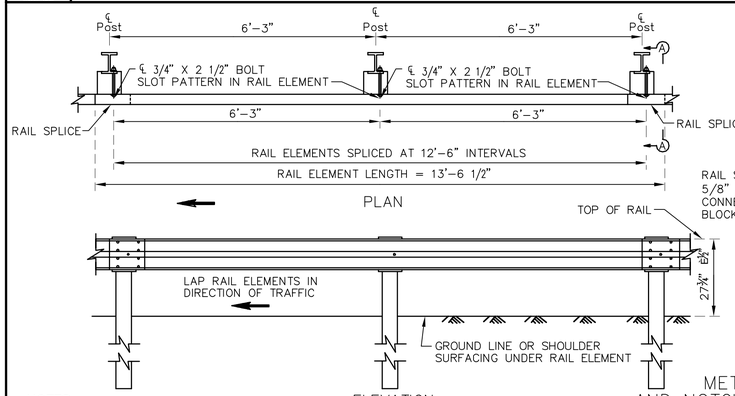
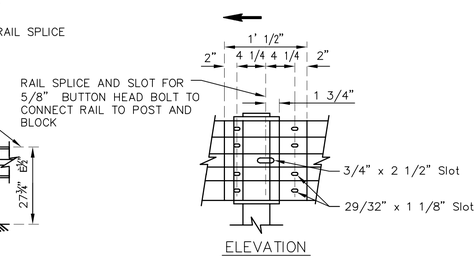
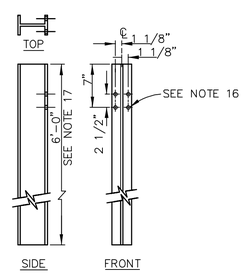
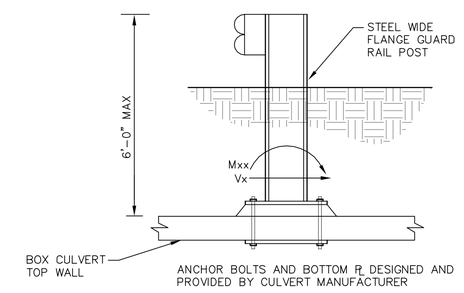


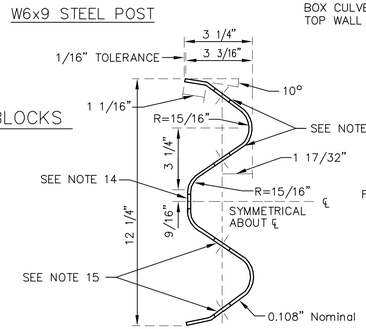




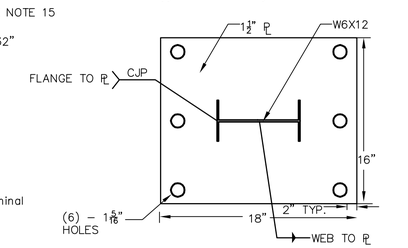
W6x9 STEEL POST



BOX CULVERT DESIGNER TO DESIGN ANCHORAGE FOR Mxx=40 kft AND Vx = 10 k
Myy=10 kft AND Vy =2.5 k



SECTION THRU RAIL ELEMENT



BASEPLATE PLAN

NOTES:

1. FOR DETAILS OF WOOD POST INSTALLATIONS, SEE CALTRANS STANDARD PLAN A77A1.
2. FOR DETAILS OF STANDARD HARDWARE USED TO CONSTRUCT GUARD RAILING, SEE CALTRANS STANDARD PLAN A77B1.
3. FOR DETAILS OF STEEL POSTS, NOTCHED WOOD BLOCKS AND NOTCHED RECYCLED PLASTIC BLOCKS USED TO CONSTRUCT GUARD RAILING, SEE CALTRANS STANDARD PLAN A77C2.
4. FOR ADDITIONAL INSTALLATION DETAILS, SEE CALTRANS STANDARD PLAN A77C3.
5. GUARD RAILING POST SPACING TO BE 6'-3" CENTER TO CENTER, EXCEPT AS OTHERWISE NOTED.
6. FOR GUARD RAILING TYPICAL LAYOUTS, SEE THE A77E, A77F AND A77G SERIES OF CALTRANS STANDARD PLANS.
7. FOR TERMINAL SYSTEM END TREATMENT DETAILS, SEE THE A77L SERIES OF CALTRANS STANDARD PLANS.
8. FOR GUARD RAILING END ANCHOR DETAILS, SEE CALTRANS STANDARD PLANS A77H1 AND A77I2.
9. FOR DETAILS OF GUARD RAILING TRANSITION TO BRIDGE RAILING, SEE CALTRANS STANDARD PLAN A77J4.
10. FOR ADDITIONAL DETAILS OF GUARD RAILING CONNECTION TO BRIDGE RAILINGS, SEE CALTRANS STANDARD PLANS A77J1, A77J2 AND A77K1.
11. FOR DIKE POSITIONING AND GUARD RAILING DELINEATION DETAILS, SEE CALTRANS STANDARD PLAN A77C4.
12. DIRECTION OF ADJACENT TRAFFIC INDICATED BY
13. NOTCHED FACE OF BLOCK FACES STEEL POST.
14. SLOTTED HOLE FOR BOLTED CONNECTION OF RAIL ELEMENT TO BLOCKAND POST. SEE "SECTION THRU RAIL ELEMENT".
15. SLOTTED HOLES FOR SPLICE BOLTS TO OVERLAP ENDS OF RAILELEMENT. SEE "SECTION THRU RAIL ELEMENT".
16. ALL HOLES IN STEEL POST SHALL BE 13/16" DIA MAX.
17. 6'-0" LENGTH POST TO BE USED FOR TYPICAL ROADWAY INSTALLATION. 7'-0" LENGTH POSTS TO BE USED FOR NARROW ROADWAY INSTALLATION.

METAL BEAM GUARD RAILING WITH STEEL POSTS AND NOTCHED WOOD OR NOTCHED RECYCLED PLASTIC BLOCKS

RAIL ELEMENT SPLICE DETAIL

1. CONNECT THE OVER LAPPED END OF THE RAIL ELEMENTS WITH 5/8" Ø X 1 3/8" BUTTON HEAD OVAL SHOULDER SPLICE BOLTS INSERTED INTO THE 39/32" X 1 1/8" SLOTS AND BOLTED TOGETHER 5/8" O RECESSED HEX NUTS. RECESS OF HEX NUT POINTS TOWARD RAIL ELEMENT. TOTAL OF 8 BOLTS AND NUTS ARE TO BE USED AT EACH RAIL SPLICE CONNECTION.
2. THE ENDS OF THE RAIL ELEMENTS ARE TO BE OVERLAPPED IN THE DIRECTION OF TRAFFIC (SEE DETAILS).
3. WHERE END CAP IS TO BE ATTACHED TO THE END OF A RAIL ELEMENT, A TOTAL OF 4 OF THE ABOVE DESCRIBED SPLICE BOLTS AND NUTS ARE TO BE USED.

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TYPICAL GUARD RAIL

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GR02

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Figure 2-3e

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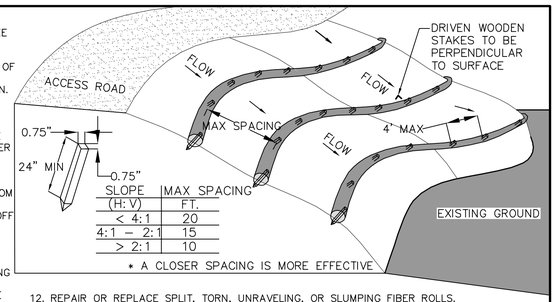
NOTE:

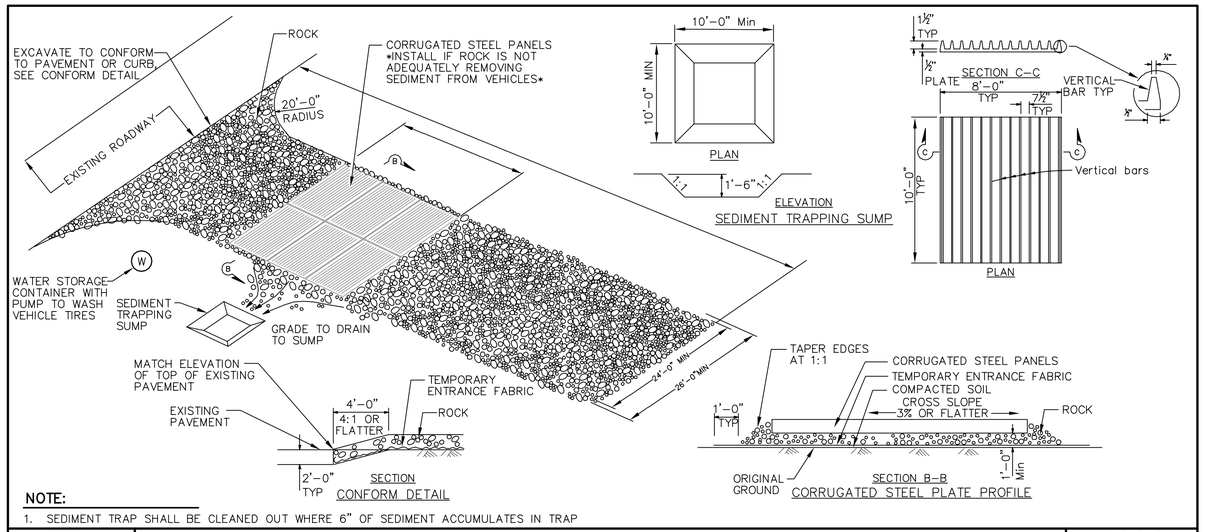
1. FIBER ROLLS SHALL BE PREFABRICATED AND MADE FROM WEED FREE RICE STRAW, FLAX, OR A SIMILAR AGRICULTURAL MATERIAL BOUND INTO A TIGHT TUBULAR ROLL BY NETTING.
2. STAKE FIBER ROLLS INTO THE TRENCH. DRIVE STAKES AT THE END OF EACH FIBER ROLL AND SPACED 4 FEET MAXIMUM ON CENTER. USE WOOD STAKES WITH NOMINAL CLASSIFICATION OF 0.75 IN BY 0.75 IN. AND A MINIMUM LENGTH OF 24 IN.
3. PREPARE THE SLOPE BEFORE BEGINNING THE INSTALLATION.
4. DIG SMALL TRENCHES ACROSS THE SLOPE ON THE CONTOUR. THE TRENCH DEPTH SHOULD BE 1/4 TO 1/3 OF THE THICKNESS OF THE ROLL, AND THE WIDTH SHOULD EQUAL THE ROLL DIAMETER, IN ORDER TO PROVIDE AREA TO BACKFILL THE TRENCH.
5. ROLLS SHALL BE INSTALLED PERPENDICULAR TO WATER MOVEMENT, AND PARALLEL TO THE SLOPE CONTOUR.
6. START BUILDING TRENCHES AND INSTALLING ROLLS FROM THE BOTTOM OF THE SLOPE AND WORK UP.
7. TURN THE ENDS OF THE FIBER ROLLS UP SLOPE TO PREVENT RUNOFF FROM GOING AROUND THE ROLL.
8. IF MORE THAN ONE FIBER ROLL IS PLACED IN A ROW, THE ROLLS SHOULD BE OVERLAPPED, NOT ABUTTED.
9. FIBER ROLLS ENCASED WITH PLASTIC NETTING ARE USED FOR A TEMPORARY APPLICATION ONLY AND SHOULD BE REMOVED FOLLOWING STABILIZATION. FIBER ROLLS USED IN A PERMANENT APPLICATION SHALL BE ENCASED WITH A BIODEGRADABLE MATERIAL AND MAY BE LEFT IN.
10. TEMPORARY INSTALLATIONS SHOULD ONLY BE REMOVED WHEN UP GRADIENT AREAS ARE STABILIZED PER GENERAL PERMIT REQUIREMENTS, AND/OR POLLUTANT SOURCES NO LONGER PRESENT A HAZARD. BUT, THEY SHOULD ALSO BE REMOVED BEFORE VEGETATION BECOMES TOO MATURE SO THAT THE REMOVAL PROCESS DOES NOT DISTURB MORE SOIL AND VEGETATION THAN IS NECESSARY
11. FIBER ROLLS MUST BE INSPECTED IN ACCORDANCE WITH GENERAL PERMIT REQUIREMENTS FOR THE ASSOCIATED PROJECT TYPE AND RISK LEVEL. IT IS RECOMMENDED THAT A MINIMUM, THE BMPS BE INSPECTED WEEKLY, PRIOR TO FORECASTED RAIN EVENTS, DAILY DURING EXTENDED RAIN EVENTS, AND AFTER THE CONCLUSION OF RAIN EVENTS.
12. REPAIR OR REPLACE SPLIT, TORN, UNRAVELING, OR SLUMPING FIBER ROLLS.
13. IF THE FIBER ROLL IS USED AS A SEDIMENT CAPTURE DEVICE, OR AS AN EROSION CONTROL DEVICE TO MAINTAIN SHEET FLOWS, SEDIMENT THAT ACCUMULATES IN THE BMP SHOULD BE PERIODICALLY REMOVED IN ORDER TO MAINTAIN BMP EFFECTIVENESS. SEDIMENT SHOULD BE REMOVED WHEN SEDIMENT ACCUMULATION REACHES ONE-THIRD THE DESIGNATED SEDIMENT STORAGE DEPTH.
14. IF FIBER ROLLS ARE USED FOR EROSION CONTROL, SEDIMENT REMOVAL SHOULD NOT BE REQUIRED AS LONG AS THE SYSTEM CONTINUES TO CONTROL THE GRADE. SEDIMENT CONTROL BMPS WILL LIKELY BE REQUIRE IN CONJUNCTION WITH THIS TYPE OF APPLICATION.
15. REPAIR ANY RILLS OR GULLIES PROMPTLY.



SLOPE (H:V)	MAX SPACING FT.
< 4:1	20
4:1 – 2:1	15
> 2:1	10

* A CLOSER SPACING IS MORE EFFECTIVE

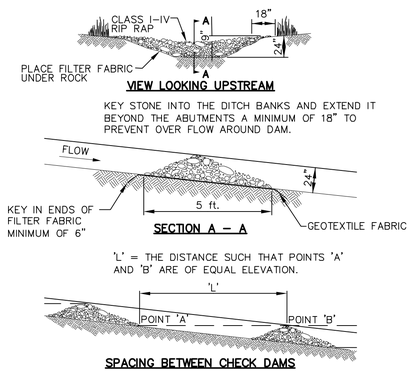
Westwood | TYPICAL FIBER ROLLS | LAST REVISED: 12/13/10 | GD40



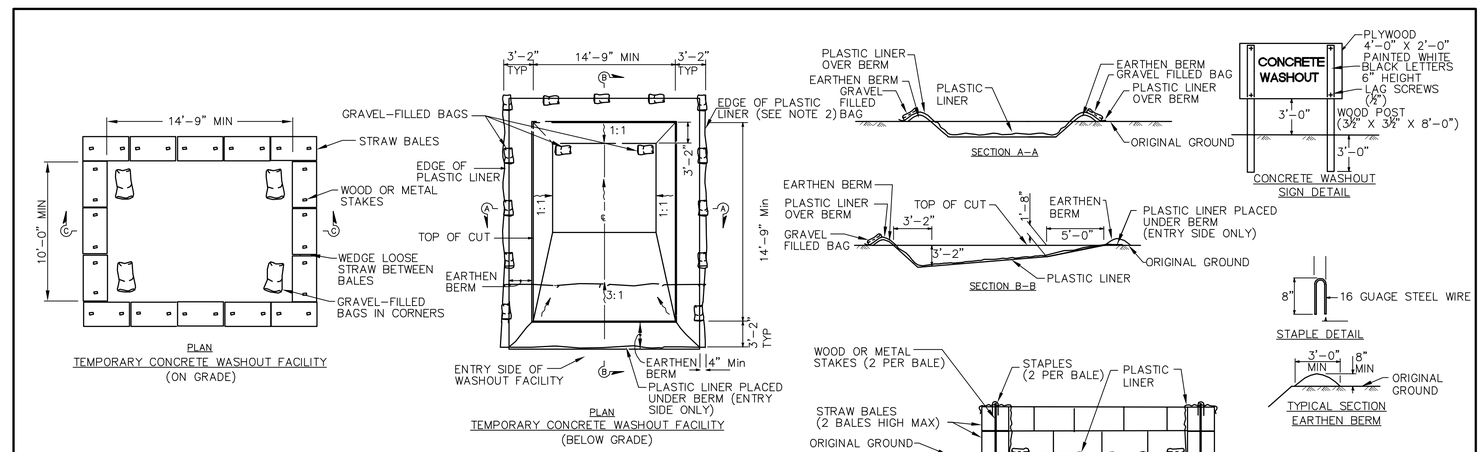
NOTE:

1. SEDIMENT TRAP SHALL BE CLEANED OUT WHERE 6" OF SEDIMENT ACCUMULATES IN TRAP

Westwood | TYPICAL CORRUGATED STEEL PANEL DETAIL | LAST REVISED: 12/14/10 | CS01



Westwood | TEMPORARY ROCK CHECK DAM | LAST REVISED: 03/03/08 | GD18



NOTE:

1. THE CONCRETE WASHOUT SIGN SHALL BE INSTALLED WITHIN 32'-10" OF THE TEMPORARY CONCRETE WASHOUT FACILITY.
2. PLASTIC LINER SHALL BE ANCHORED WITH GRAVEL-FILLED BAGS FOR BELOW GRADED CONCRETE WASHOUT FACILITY

Westwood | TEMPORARY WASHOUT FACILITY | LAST REVISED: 01/14/09 | WM08

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Figure 2-3f

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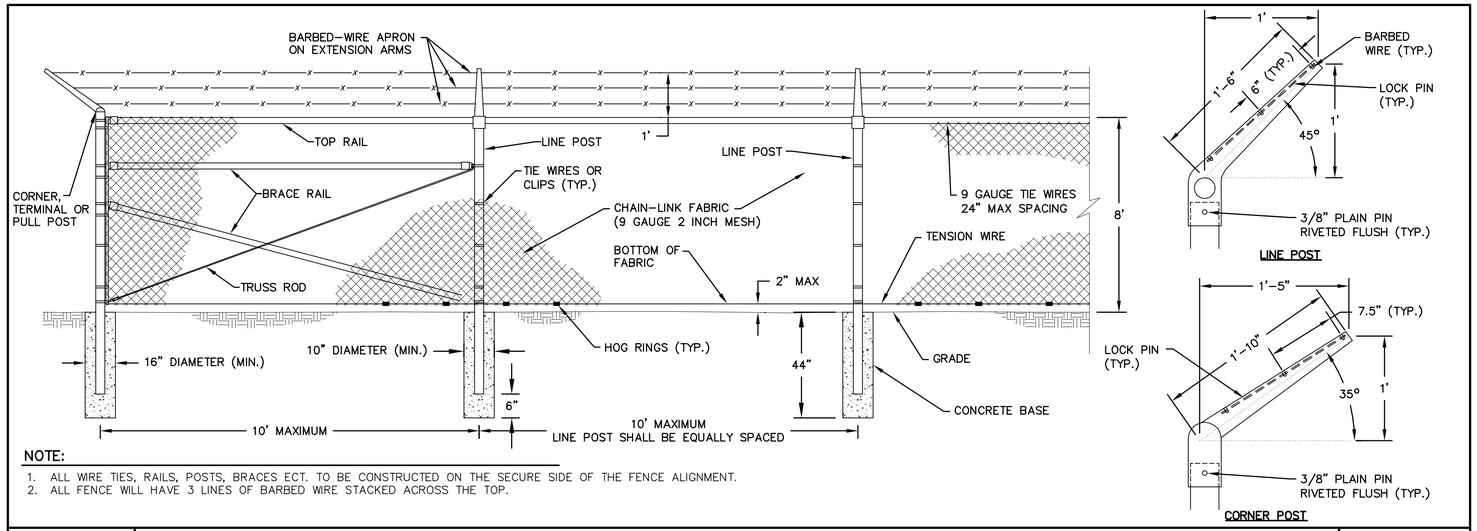

NOTE:

1. ALL WIRE TIES, RAILS, POSTS, BRACES ECT. TO BE CONSTRUCTED ON THE SECURE SIDE OF THE FENCE ALIGNMENT.
2. ALL FENCE WILL HAVE 3 LINES OF BARBED WIRE STACKED ACROSS THE TOP.

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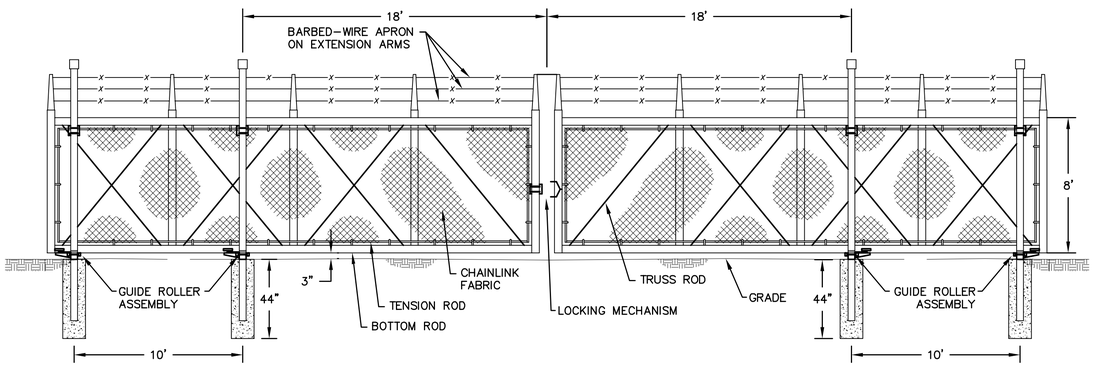
CHAIN-LINK SECURITY FENCE DETAIL

LAST REVISED: 01/14/09

FN04



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CHAIN-LINK SECURITY LEAF GATE

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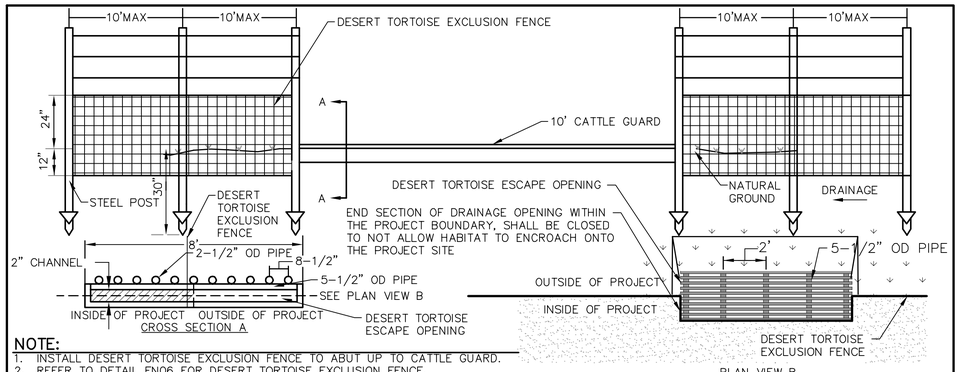
GA05



NOTE:

1. INSTALL DESERT TORTOISE EXCLUSION FENCE TO ABUT UP TO CATTLE GUARD.
2. REFER TO DETAIL FN06 FOR DESERT TORTOISE EXCLUSION FENCE.
3. CATTLE GUARD ARE ONLY REQUIRED KEEP WILDLIFE OUT OF SOLAR FARM.
4. CATTLE GUARD SHOULD BE INSPECTED ON A REGULAR BASIS SUFFICIENT TO MAINTAIN AN EFFECTIVE BARRIER TO WILDLIFE. INSPECTIONS SHOULD BE DOCUMENTED IN WRITING AND INCLUDE AN OBSERVATION OF ENTRAPPED ANIMALS AND REPAIRS NEEDED.
5. ALL CATTLE GUARDS THAT SERVE AS TORTOISE BARRIERS SHOULD BE INSTALLED AND MAINTAINED TO ENSURE THAT ANY TORTOISE THAT FALLS UNDERNEATH HAS A PATH OF ESCAPE WITHOUT CROSSING THE INTENDED BARRIER.

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GATE TYPE C – CATTLE GUARD

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Figure 2-3g

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LEGEND:

- TYPICAL 12' WIDTH ACCESS ROAD
- PHASE I TYPICAL TRACKER ROW (24 MODULES)
- PROPOSED FENCE
- EXISTING TELEPHONE LINE
- EXISTING OVERHEAD POWER
- EXISTING GAS LINE
- PV MODULE SETBACK
- EXISTING GATE VALVE
- EXISTING ELECTRIC BOX
- EXISTING WATER METER
- EXISTING WELL
- EXISTING TELEPHONE BOX
- EXISTING POST
- EXISTING GUY WIRE
- NOT A PART OF PROJECT
- EXISTING RIGHT-OF-WAY
- SECTION LINE
- EXISTING 2' CONTOURS
- EXISTING 10' CONTOURS
- EXISTING PAVED ROAD
- EXISTING DIRT ROAD
- EXISTING WATER OF THE STATE
- ENVIRONMENTALLY SENSITIVE AREA
- 1.5' 100-YEAR FLOOD DEPTH
- MAIN SERVICE COMPLEX
- SUBSTATION
- INVERTER PAD
- SUNCATCHER UNIT

N

0' 300' 600' 900'

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Figure 2-3h

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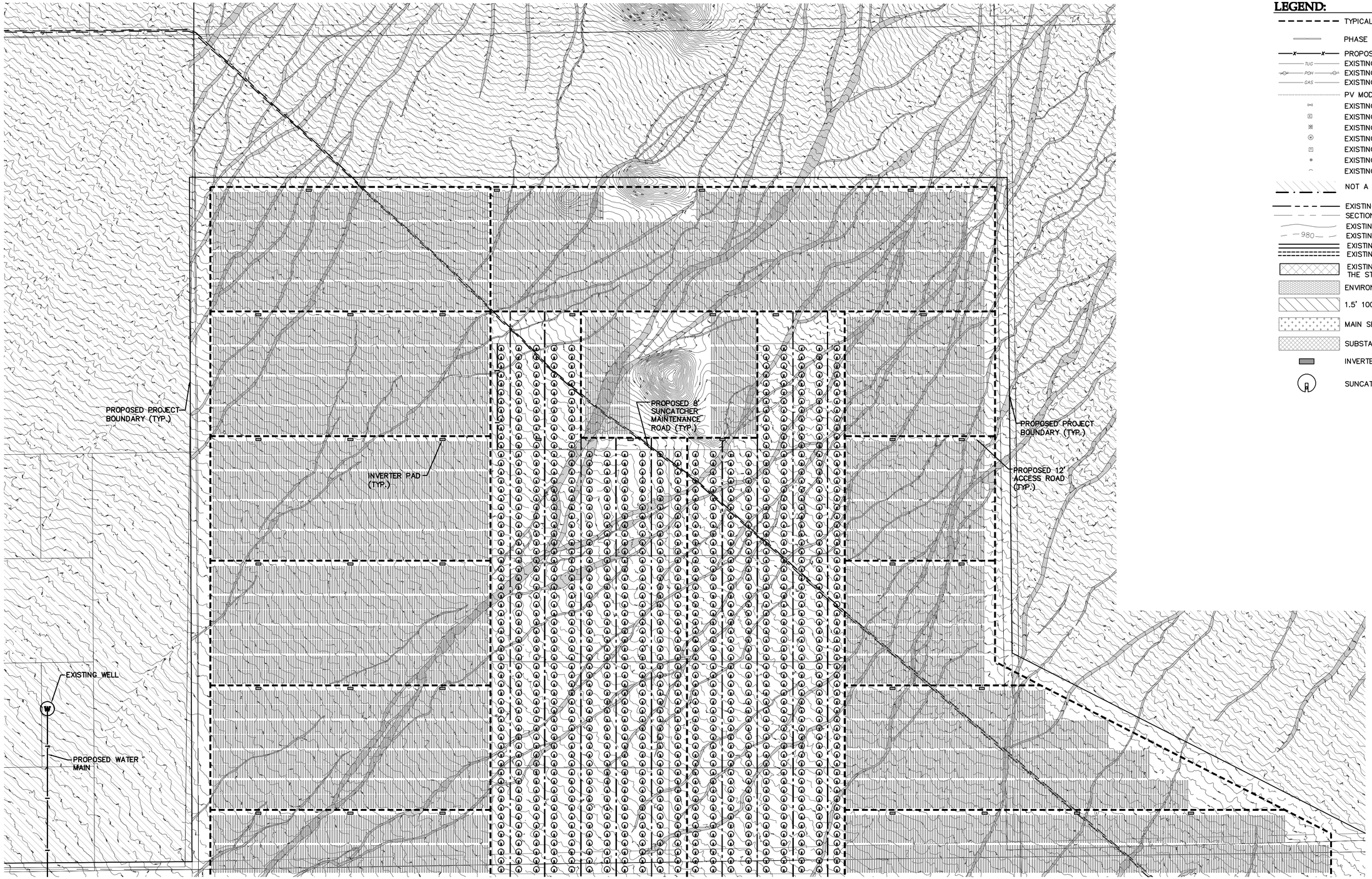

LEGEND:

- TYPICAL 12' WIDTH ACCESS ROAD
- PHASE I TYPICAL TRACKER ROW (24 MODULES)
- PROPOSED FENCE
- TUC — EXISTING TELEPHONE LINE
- POH — EXISTING OVERHEAD POWER
- GAS — EXISTING GAS LINE
- PV MODULE SETBACK
- EXISTING GATE VALVE
- EXISTING ELECTRIC BOX
- EXISTING WATER METER
- EXISTING WELL
- EXISTING TELEPHONE BOX
- EXISTING POST
- EXISTING GUY WIRE
- NOT A PART OF PROJECT
- EXISTING RIGHT-OF-WAY
- SECTION LINE
- EXISTING 2' CONTOURS
- 980 — EXISTING 10' CONTOURS
- EXISTING PAVED ROAD
- EXISTING DIRT ROAD
- EXISTING WATER OF THE STATE
- ENVIRONMENTALLY SENSITIVE AREA
- 1.5' 100-YEAR FLOOD DEPTH
- MAIN SERVICE COMPLEX
- SUBSTATION
- INVERTER PAD
- SUNCATCHER UNIT

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Figure 2-3i

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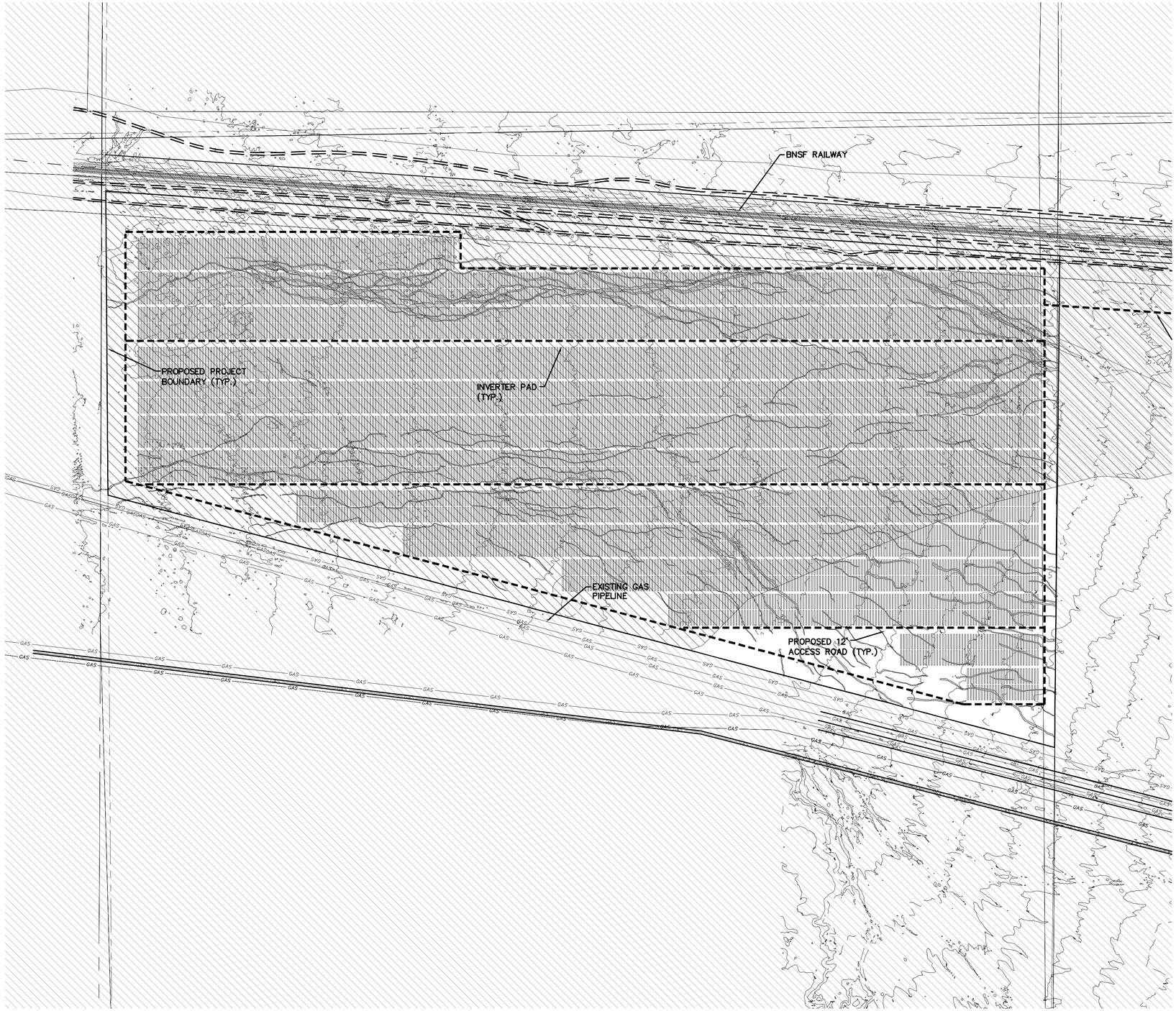

LEGEND:

- TYPICAL 12' WIDTH ACCESS ROAD
- PHASE I TYPICAL TRACKER ROW (24 MODULES)
- PROPOSED FENCE
- EXISTING TELEPHONE LINE
- EXISTING OVERHEAD POWER
- EXISTING GAS LINE
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- EXISTING ELECTRIC BOX
- EXISTING WATER METER
- EXISTING WELL
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- EXISTING POST
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- EXISTING RIGHT-OF-WAY
- SECTION LINE
- EXISTING 2' CONTOURS
- EXISTING 10' CONTOURS
- EXISTING PAVED ROAD
- EXISTING DIRT ROAD
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- 1.5' 100-YEAR FLOOD DEPTH
- MAIN SERVICE COMPLEX
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- SUNCATCHER UNIT

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Figure 2-3j

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LEGEND:

- TYPICAL 12' WIDTH ACCESS ROAD
- PHASE I TYPICAL TRACKER ROW (24 MODULES)
- PROPOSED FENCE
- EXISTING TELEPHONE LINE
- EXISTING OVERHEAD POWER
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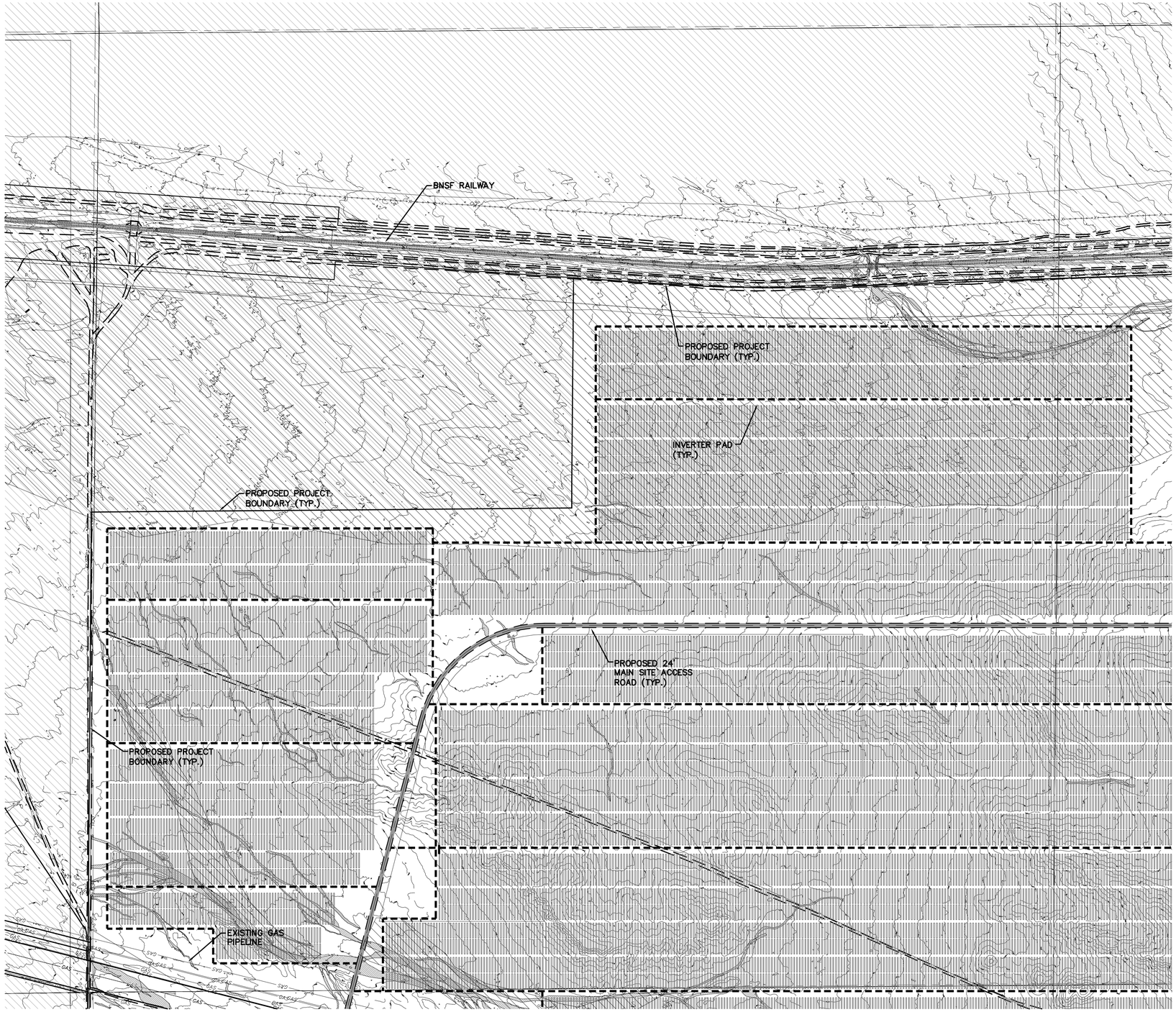

LEGEND:

- TYPICAL 12' WIDTH ACCESS ROAD
- PHASE I TYPICAL TRACKER ROW (24 MODULES)
- PROPOSED FENCE
- EXISTING TELEPHONE LINE
- EXISTING OVERHEAD POWER
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- ENVIRONMENTALLY SENSITIVE AREA
- 1.5' 100-YEAR FLOOD DEPTH
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- SUBSTATION
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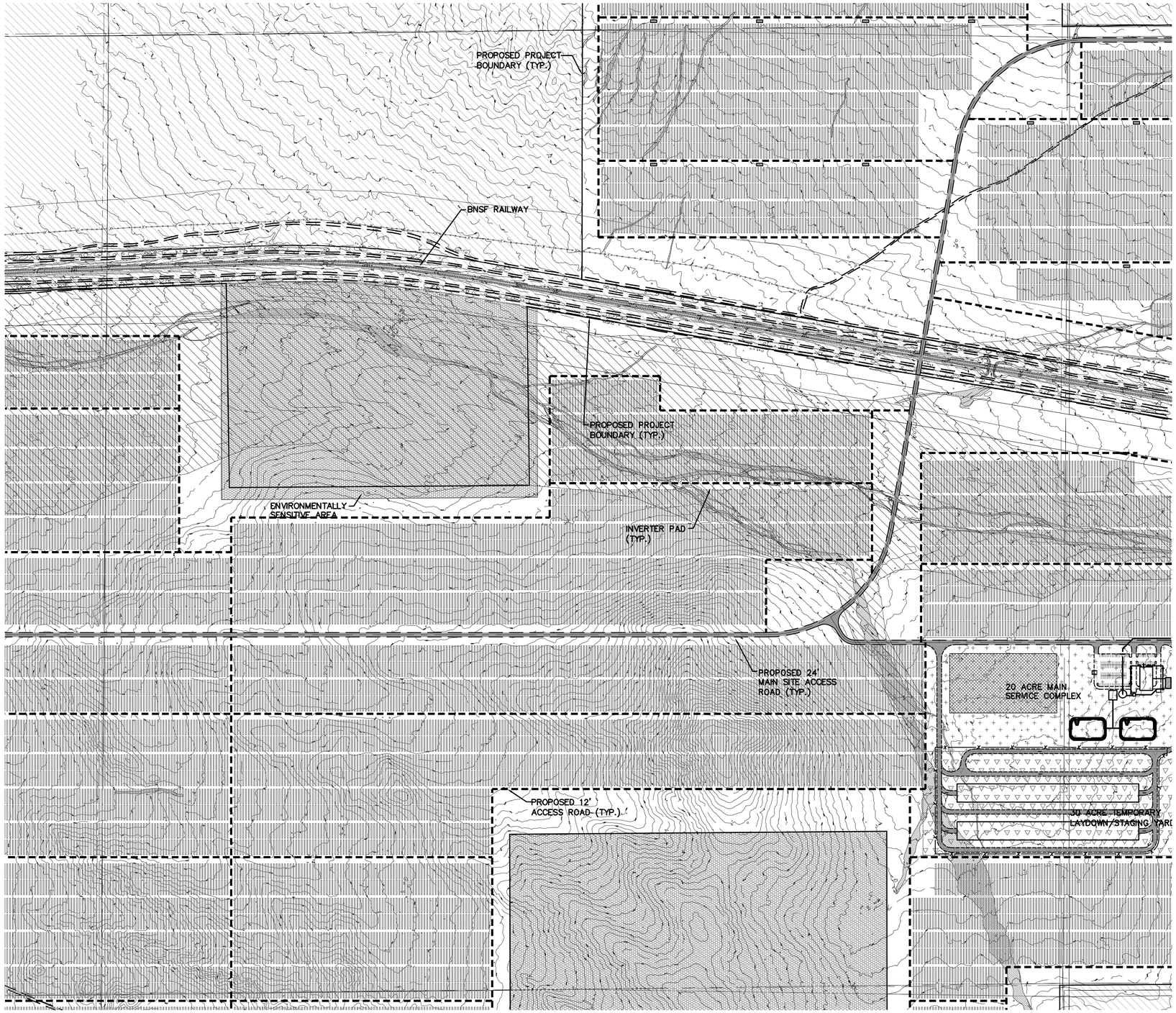

LEGEND:

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- PHASE I TYPICAL TRACKER ROW (24 MODULES)
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- EXISTING TELEPHONE LINE
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- EXISTING WATER METER
- EXISTING WELL
- EXISTING TELEPHONE BOX
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- SECTION LINE
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- EXISTING 10' CONTOURS
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- EXISTING DIRT ROAD
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Figure 2-3m

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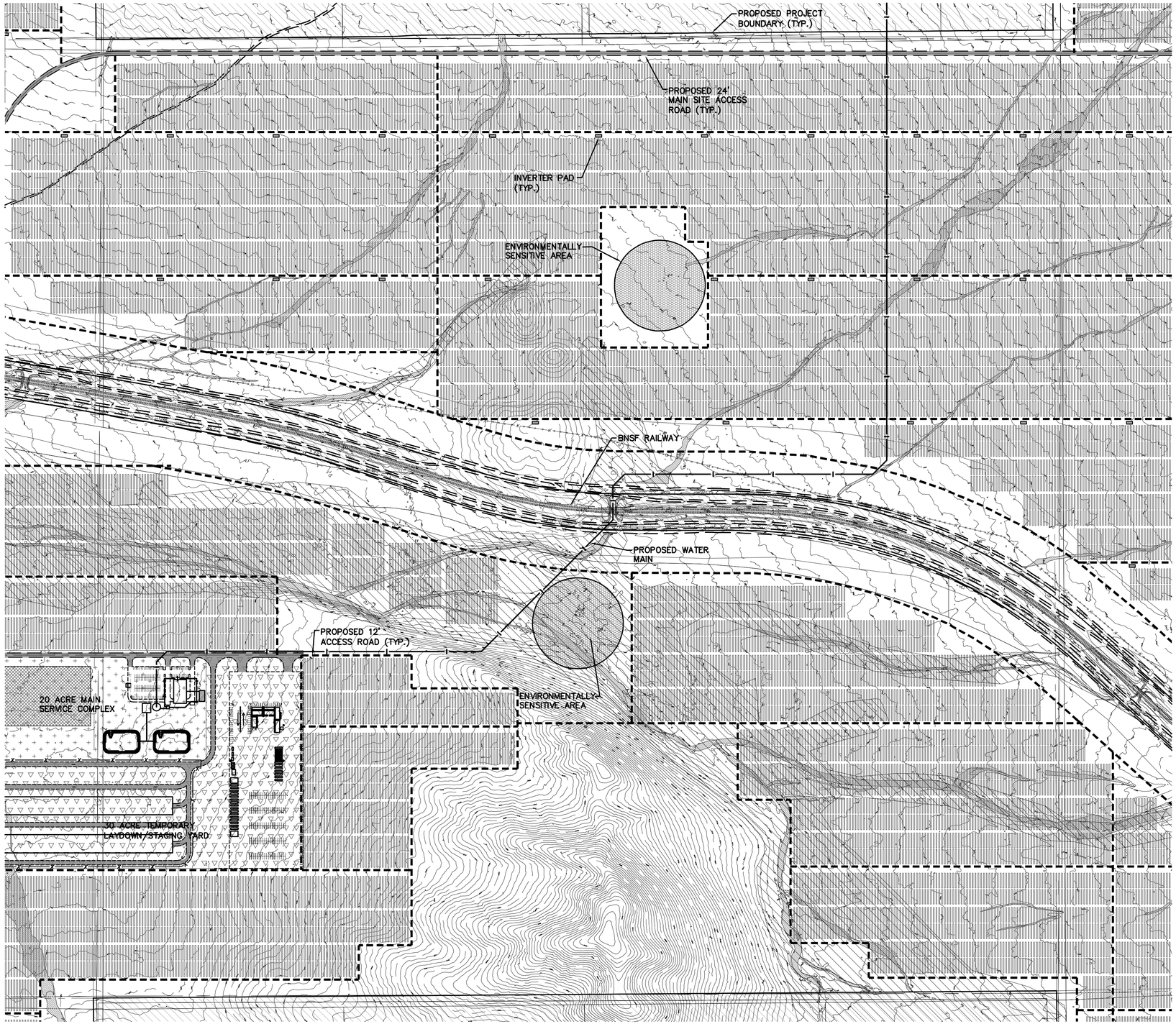

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- PHASE I TYPICAL TRACKER ROW (24 MODULES)
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- EXISTING PAVED ROAD
- EXISTING DIRT ROAD
- EXISTING WATER OF THE STATE
- ENVIRONMENTALLY SENSITIVE AREA
- 1.5' 100-YEAR FLOOD DEPTH
- MAIN SERVICE COMPLEX
- SUBSTATION
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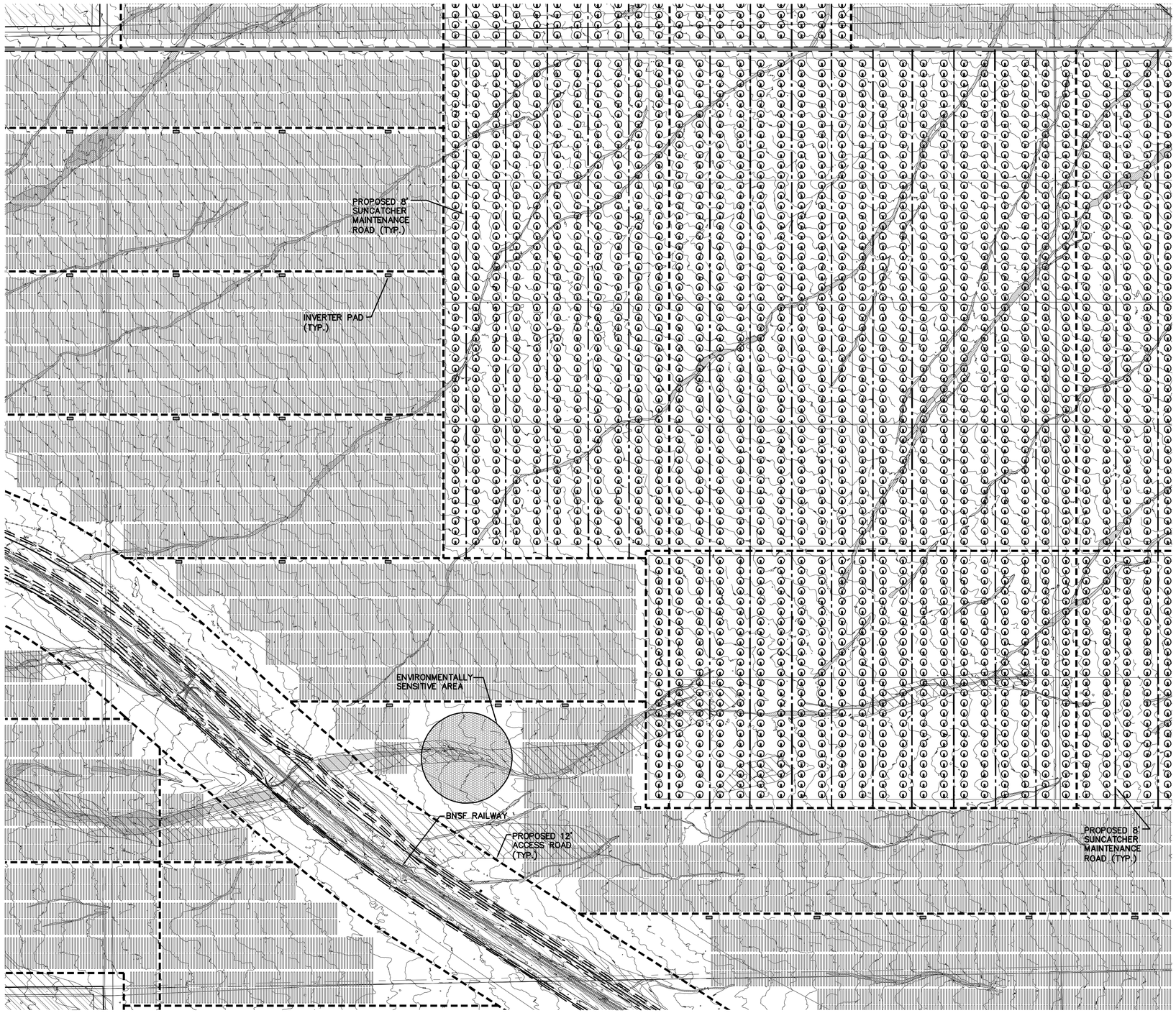

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- EXISTING TELEPHONE BOX
- EXISTING POST
- EXISTING GUY WIRE
- NOT A PART OF PROJECT
- EXISTING RIGHT-OF-WAY
- SECTION LINE
- EXISTING 2' CONTOURS
- EXISTING 10' CONTOURS
- EXISTING PAVED ROAD
- EXISTING DIRT ROAD
- EXISTING WATER OF THE STATE
- ENVIRONMENTALLY SENSITIVE AREA
- 1.5' 100-YEAR FLOOD DEPTH
- MAIN SERVICE COMPLEX
- SUBSTATION
- INVERTER PAD
- SUNCATCHER UNIT

N

0' 300' 600' 900'

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Date: 02/23/11 Sheet: 15 OF 19

Calico Solar

San Bernardino County, California

Civil Plan 8

Figure 2-3o

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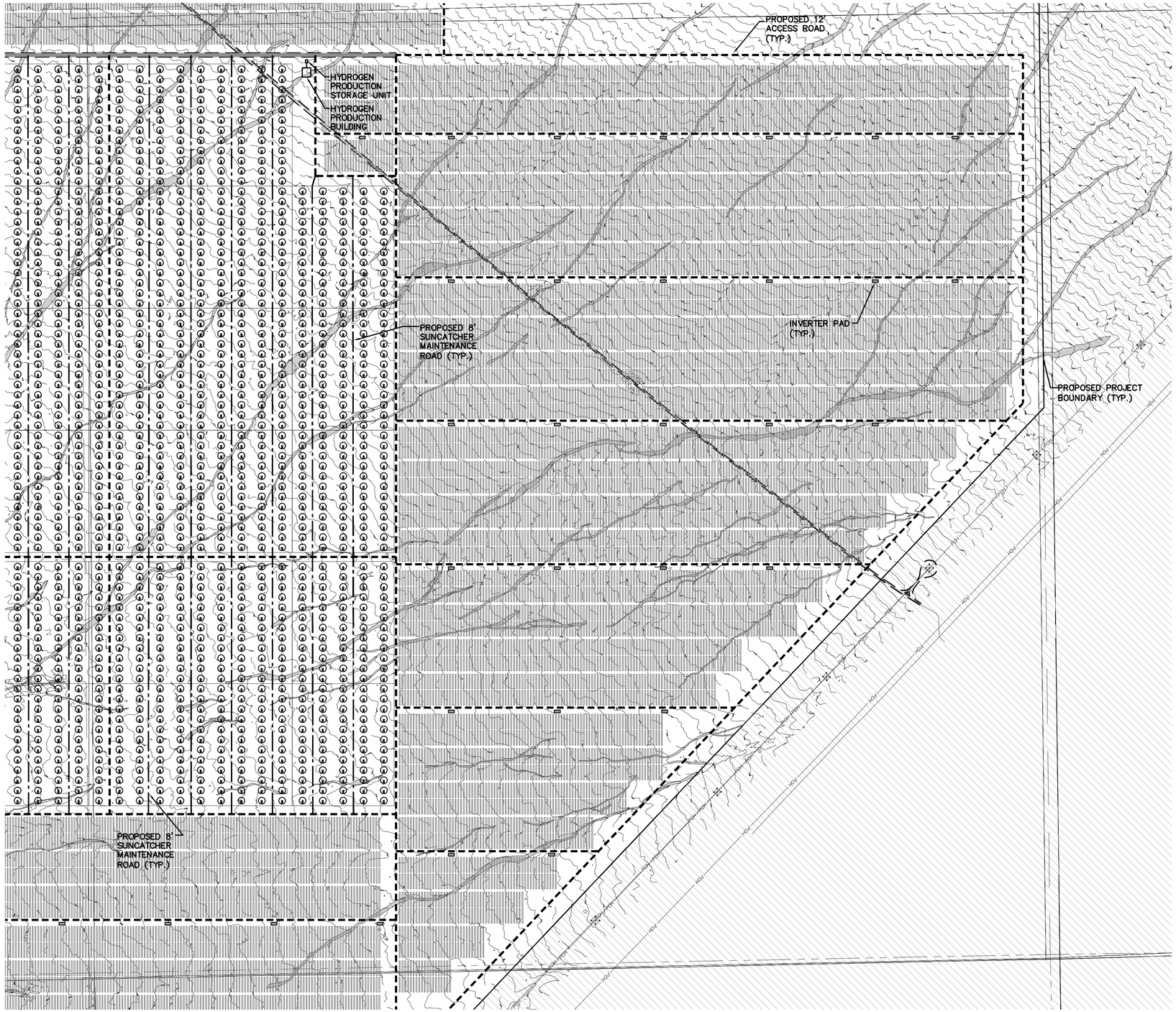

LEGEND:

- TYPICAL 12' WIDTH ACCESS ROAD
- PHASE I TYPICAL TRACKER ROW (24 MODULES)
- PROPOSED FENCE
- EXISTING TELEPHONE LINE
- EXISTING OVERHEAD POWER
- EXISTING GAS LINE
- PV MODULE SETBACK
- EXISTING GATE VALVE
- EXISTING ELECTRIC BOX
- EXISTING WATER METER
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- MAIN SERVICE COMPLEX
- SUBSTATION
- INVERTER PAD
- SUNCATCHER UNIT

0' 300' 600' 900'

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Date: 02/23/11 Sheet: 16 OF 19

Calico Solar

San Bernardino County, California

Civil Plan 9

Figure 2-3p

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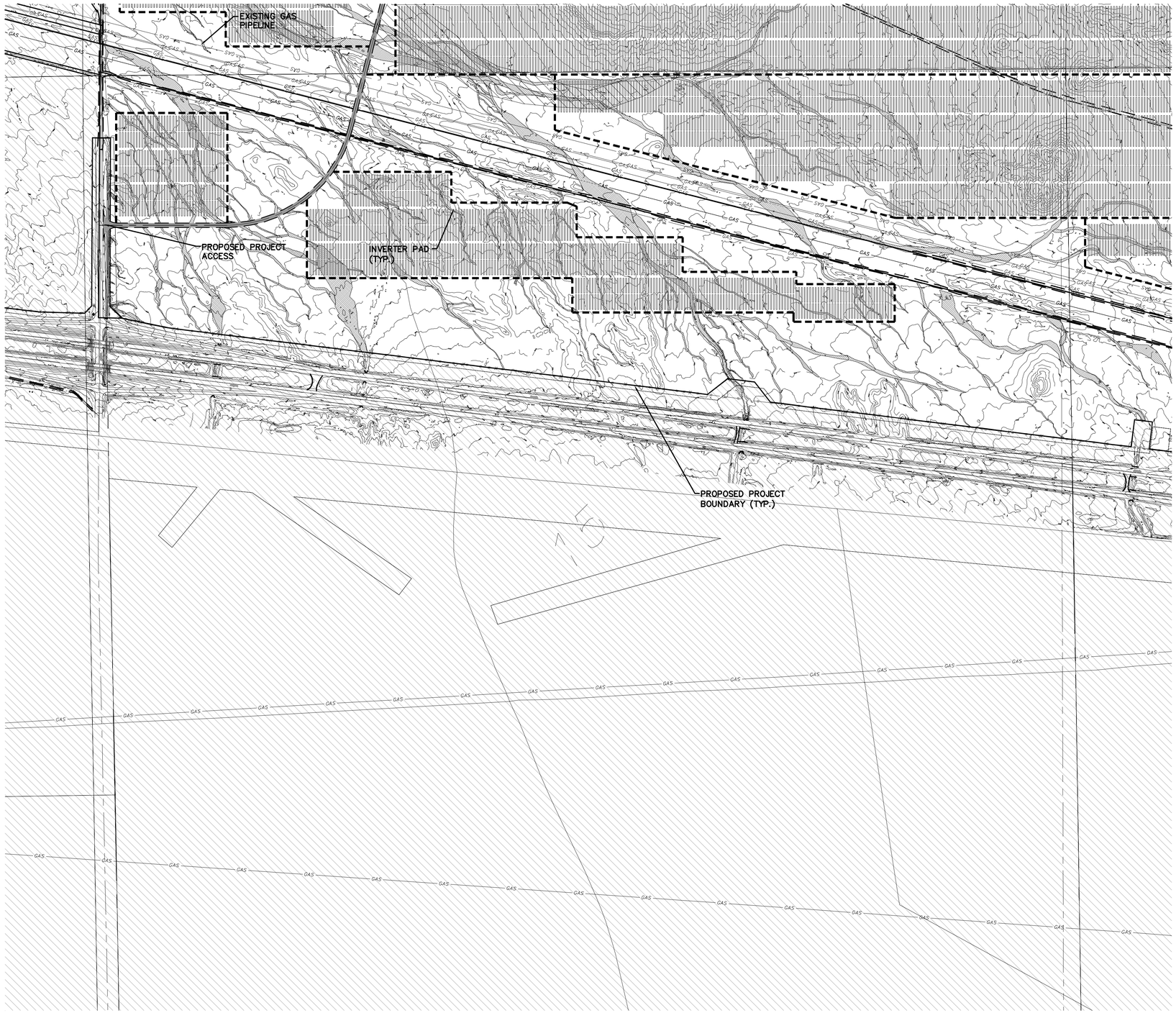

LEGEND:

- TYPICAL 12' WIDTH ACCESS ROAD
- PHASE I TYPICAL TRACKER ROW (24 MODULES)
- PROPOSED FENCE
- EXISTING TELEPHONE LINE
- EXISTING OVERHEAD POWER
- EXISTING GAS LINE
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- EXISTING WATER METER
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Calico Solar

San Bernardino County, California

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Civil Plan 10

Figure 2-3q

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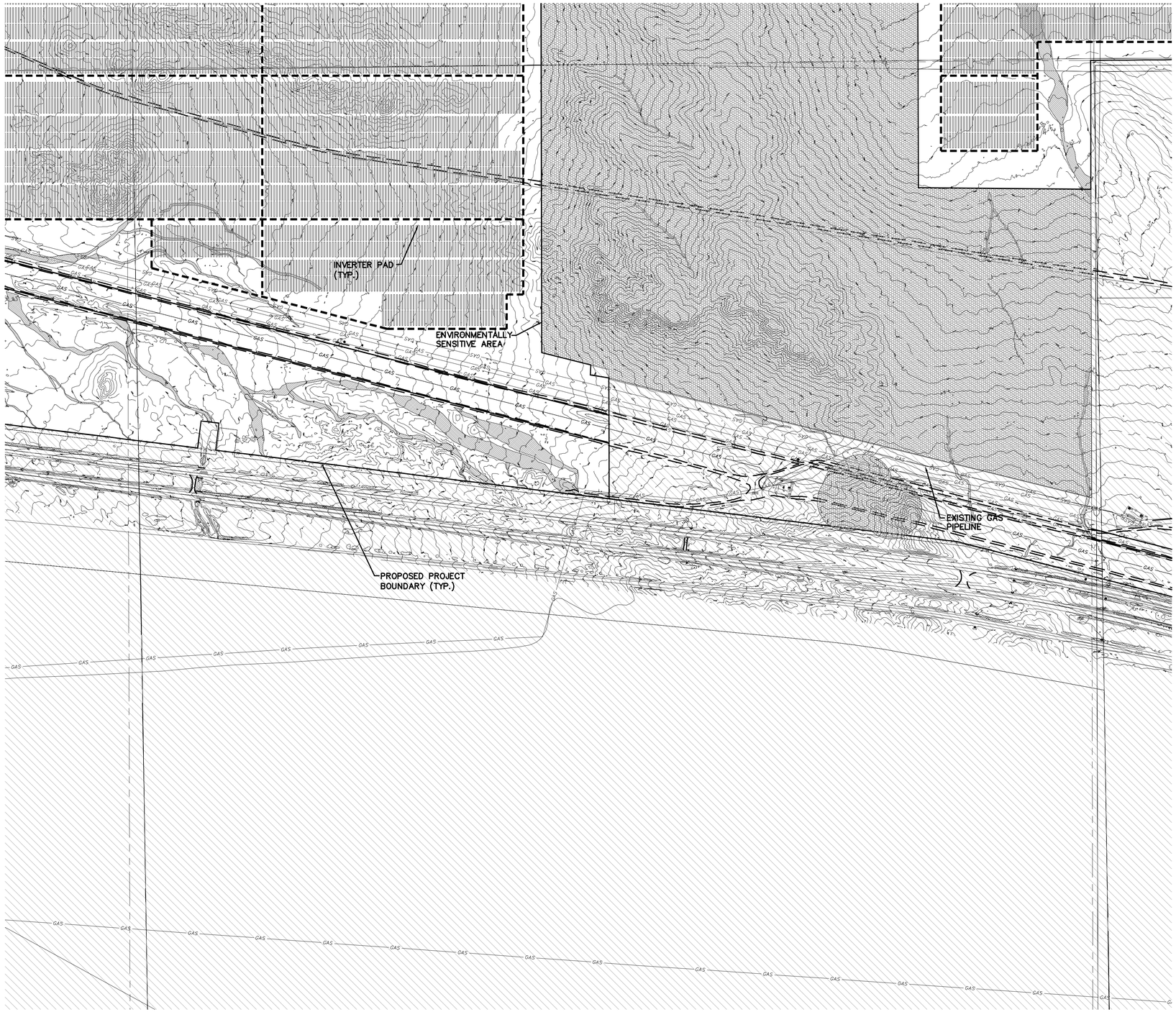

LEGEND:

- TYPICAL 12' WIDTH ACCESS ROAD
- PHASE I TYPICAL TRACKER ROW (24 MODULES)
- PROPOSED FENCE
- EXISTING TELEPHONE LINE
- EXISTING OVERHEAD POWER
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- SUBSTATION
- INVERTER PAD
- SUNCATCHER UNIT

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0' 300' 600' 900'

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Date: 02/23/11 Sheet: 18 OF 19

Calico Solar

San Bernardino County, California

Civil Plan 11

Figure 2-3r

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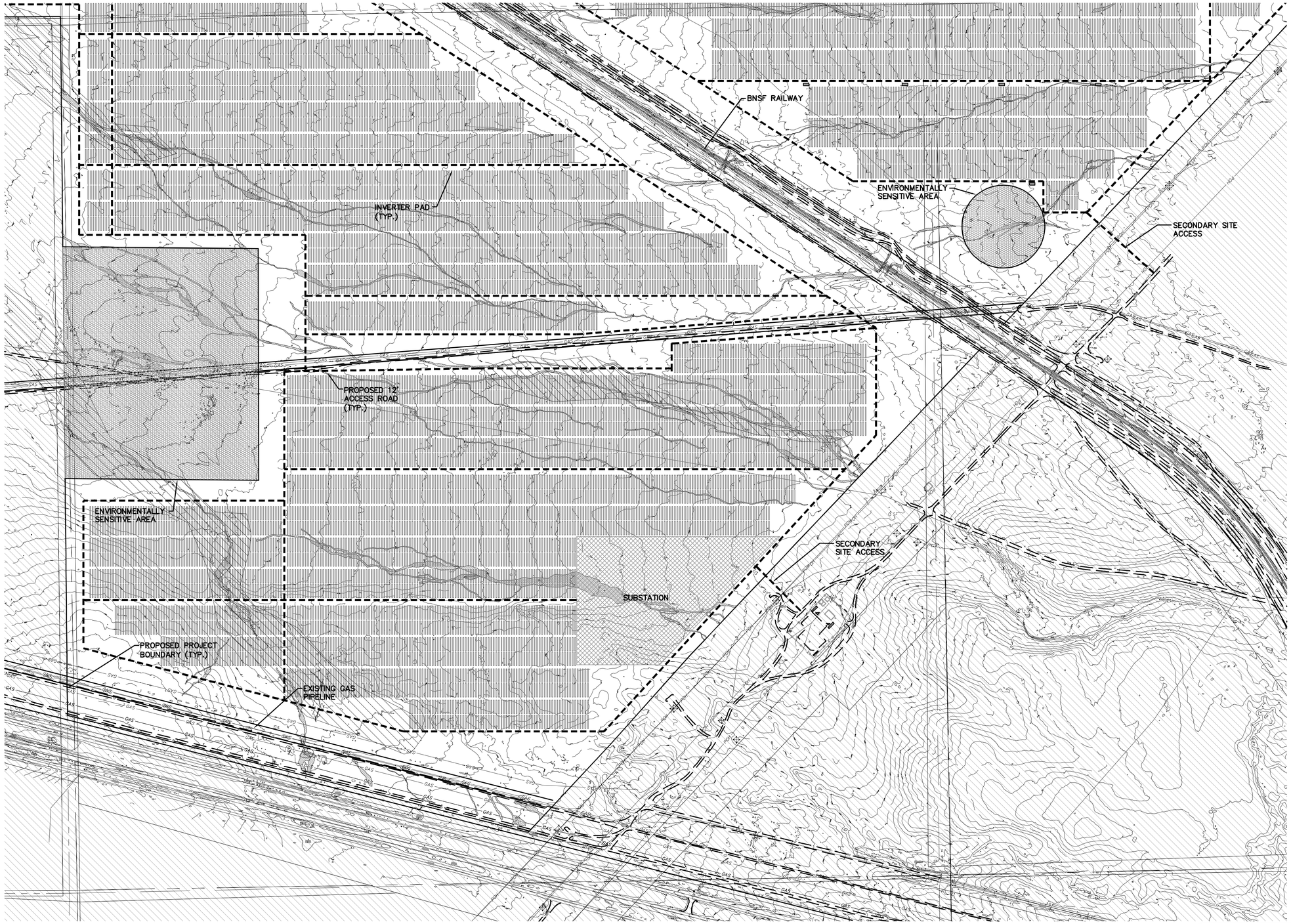

LEGEND:

- TYPICAL 12' WIDTH ACCESS ROAD
- PHASE I TYPICAL TRACKER ROW (24 MODULES)
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N

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San Bernardino County, California

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Civil Plan 12

Figure 2-3s

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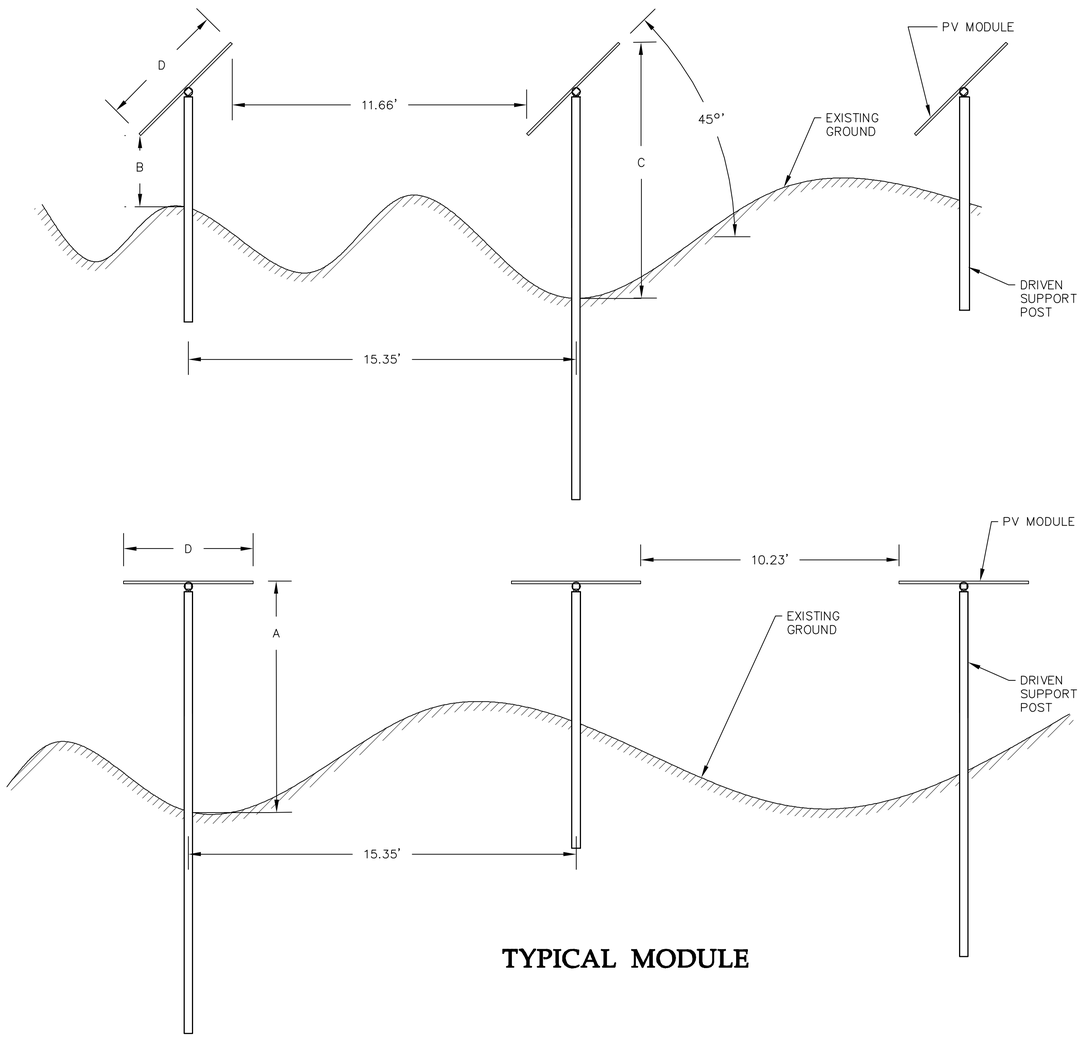

TYPICAL MODULE

Varying Post Heights			
A	B	C	D
5'	3.06'	6.75'	5.1'
6'	4.06'	7.75'	5.1'
7'	5.06'	8.75'	5.1'
8'	6.06'	9.75'	5.1'

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Date: 03/15/2011 Sheet: 1 OF 1

Calico Solar

San Bernardino County, California

Construction Details

Figure 2-4

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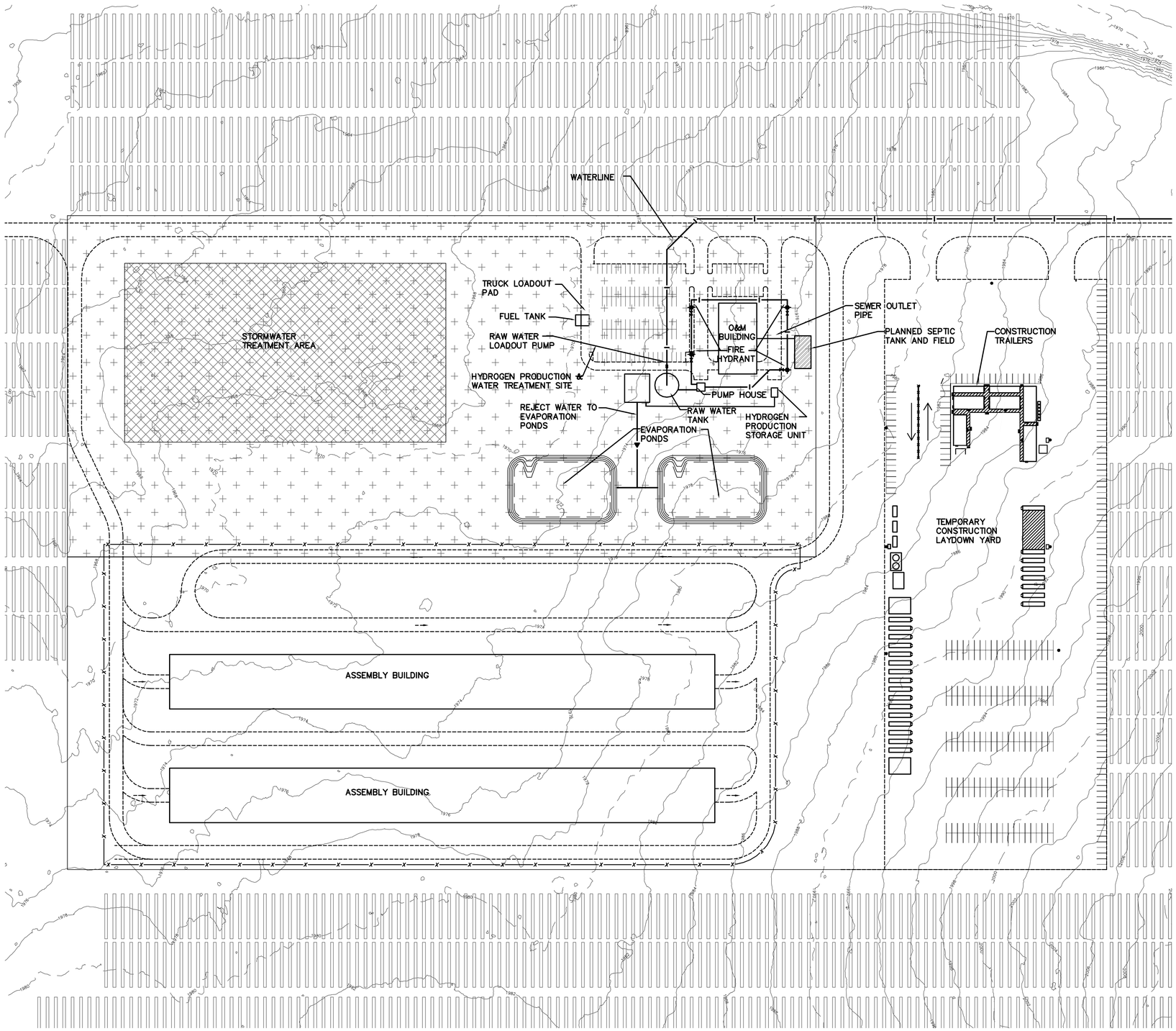

LEGEND:

- TYPICAL MAIN SERVICE COMPLEX ACCESS ROAD
- PHASE I TYPICAL TRACKER ROW
- EXISTING 2' CONTOURS
- 980 EXISTING 10' CONTOURS
- MAIN SERVICE COMPLEX
- STORMWATER TREATMENT AREA

N

0' 100' 200' 300'

20101055-10SPF03.dwg

Date: 01/28/10 Sheet: 1 OF 1

Calico Solar

San Bernardino County, California

Main Service Complex and Temporary Laydown Yard

Figure 2-5

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SECTION 3 NECESSITY OF THE MODIFIED PROJECT

Sections 1769(a)(1)(B), (C), and (D) of the Commission's Power Plant Siting Regulations require that an amendment provide information on: 1) the necessity for the proposed modifications, 2) whether the modification was based on information known during the licensing proceedings, and 3) if the modification is based on new information that changes or undermines the bases of the Commission Decision, why the change should be permitted. This section provides information on these three related topics.

3.1 NECESSITY

On December 24, 2010, K Road Sun LLC (K Road) purchased Calico Solar, LLC from Tessera Solar North America. Because the SunCatchers would not be commercially available in the near term, K Road determined that for the project to be viable, a portion of the technology would need to be replaced with a technology that was currently commercially available and able to attract financing. K Road also determined that the Approved Project phases needed to be modified in order to allow additional time to obtain access over the railroad.

3.2 RELATION TO THE CERTIFICATION PROCEEDING

The Commission's Power Plant Siting Regulations require a Petition for Amendment to address whether the "…modification is based on information that was known by the petitioner during the certification proceeding and an explanation of why the issue was not raised at that time." (Section 1769(a)(1)(C)). During the licensing proceedings, it was not known whether Calico Solar would be sold or what changes a new owner may pursue for the Approved Project. K Road did not purchase the Approved Project until December 24, 2010, following the Project's licensing proceedings.

3.3 REASONS FOR PERMITTING THE MODIFIED PROJECT

The Commission's Power Plant Siting Regulations also require a Petition for Amendment to discuss: "If the modification is based on new information that changes or undermines the assumptions, rationale, findings, or other bases of the Commission Decision, an explanation of why the change should be permitted." (Section 1769(a)(1)(D)).

The proposed modifications are based on new information, but this information does not adversely change or undermine any of the assumptions, rationale, findings, or basis for the Commission Decision. The findings contained in the Commission Decision (noted in italics) and their relationship to the Amendment are discussed below.

1. *The Calico Solar Project will provide a degree of economic benefit and electricity reliability to the local area*. The Modified Project would not change or undermine this finding. The Modified Project would ensure that these benefits are provided to San Bernardino County and the surrounding area when they are most needed. San Bernardino County remains an area hit hard by the economic recession. While the Commission Decision envisioned construction commencing at the end of 2010, this Amendment would allow construction to begin in late 2011. *The Conditions*

of Certification contained in the accompanying text, if implemented by the project owner, ensure that the project will be designed, sited, and operated in conformity with applicable local, regional, state, and federal laws, ordinances, regulations, and standards, including applicable public health and safety standards, and air and water quality standards. The Modified Project would not change the intent or substance of the approved Conditions. The Amendment rather proposes to change the language of some Conditions to reflect the proposed modifications in technology and change in phasing while ensuring the Project would be constructed and operated in conformity with LORS.

2. *Implementation of the Conditions of Certification contained in the accompanying text will ensure protection of environmental quality and assure reasonably safe and reliable operation of the facility. The Conditions of Certification also assure that the project's direct, indirect, and cumulative adverse environmental impacts will be mitigated to the extent feasible. Where full mitigation is not feasible, overriding considerations warrant acceptance of those impacts.* The Modified Project would not change the intent or substance of the approved Conditions with respect to protection of environmental quality and safe and reliable operation of the facility. The Amendment rather proposes to change the language of some Conditions to reflect the proposed modifications in technology and phasing while ensuring that the impacts of the Modified Project remain equal to or less than those of the Approved Project. In fact, as stated in Section 3.1, the reconfiguration under the Modified Project would ensure that desert tortoise surveys and translocation for Phase 2 of the Modified Project, where higher-density habitat is located, would be conducted in the spring, the optimal season for such activities.

3. *As is discussed in Section VIII (Override Findings) of the PMPD, the benefits of the Calico Solar Project outweigh any significant direct, indirect, or cumulative impacts which may result from its construction or operation*. The Commission Decision contained six findings that were the basis for its determination that the Approved Project "…is required for public convenience and necessity and that there are no more prudent and feasible means of achieving such public convenience and necessity." (Commission Decision, page Override 5). In addition to recognizing the serious threat posed by climate change to the "economic well-being, public health, natural resources, and the environment of California" (Commission Decision, page Override 6), the Commission found that the Approved Project had several benefits as described below (Commission Decision, page Override 6 and 7).

    a. Contribution of 663.5 MW of renewable energy power toward meeting California's Renewables Portfolio Standard and California's adopted renewable energy and GHG policy goals.

    b. A significant reduction in GHG emissions when compared with existing fossil fuel-burning generating facilities.

    c. Other important benefits to California's environment and economy, including improving local air quality and public health, developing local energy sources, and diversifying the energy supply.

    d. Reduction of California's dependence on fossil fuels.

e. Economic boosts due to the purchase of major equipment, payroll, and supplies, and increased sales tax revenue. Additional indirect economic benefits, such as indirect employment, and induced employment, would result from these expenditures as well.

f. New construction jobs for an average and peak workforce of 400 and 700, respectively, and approximately 180 jobs during operations. Most of those jobs would require highly trained workers.

As with the Approved Project, the Modified Project would provide a much needed renewable energy project to help SCE meet the State's Renewable Portfolio Standards and to reduce GHG emissions. The modifications proposed in this Amendment would not change or undermine the bases of any of the findings. The Modified Project would employ a smaller workforce, but the significant benefits of the Modified Project would remain.

4. *Existing governmental land use restrictions are sufficient to adequately control population density in the area surrounding the facility and may reasonably be expected to ensure public health and safety*. The Modified Project is expected to result in a small public health and safety benefit. The Commission found that the Approved Project does "…not pose a significant direct, indirect, or cumulative adverse public health risk," and "…will not result in significant public health impacts during construction or operation," and "…will comply with the applicable laws, ordinances, regulations, and standards…" (Commission Decision, page Public Health 10). Modifying the Approved Project to use PV modules and fewer SunCatchers would reduce the use of hydrogen on site and further reduce the less than significant risk identified by the Commission.

5. *The project is subject to Fish and Game Code section 711.4 and the project owner must therefore pay a nine hundred forty-nine dollars and fifty cents ($949.50) fee to CDFG*. This fee has been paid.

6. *No feasible mitigation measures or site or generation technology alternatives to the project, as described during these proceedings, exist which would reduce or eliminate any significant environmental impacts of the mitigated project.* In the Commission Decision (page Override 6), the Commission found that the Approved Project would result in impacts that could not be mitigated to insignificant levels, as described below.

   a. A cumulative contribution to permanent long term, potentially unmitigable, adverse impacts to historic Route 66 in the Approved Project vicinity as a result of the physical degradation of and visual intrusion on significant cultural resources on those sites and an overall net reduction in cultural resources in the area.

   b. A permanent change in the nature of land use at the Project site from Government Special Public Limited Use and Moderate Use to an intensive utility use for the generation of power. The combined effect of the overall cumulative past, present, and proposed and reasonably foreseeable projects, including the proposed Project, in the desert region of San Bernardino County would significantly impact recreation and wilderness resources.

c. The installation of a large, industrial facility on a presently undeveloped (although partially disturbed) landscape would have significant unmitigable impacts to visual vistas in the Project vicinity. In addition it would, in combination with the other renewable energy projects proposed in the Project's viewshed, make a cumulatively considerable contribution to significant cumulative visual impacts to the viewshed.

d. Additionally, the Commission found that its Decision would result in mitigation of all direct project impacts and all cumulative project impacts for the Approved Project, except to Land Use and Visual and Cultural Resources, and imposed all feasible mitigation measures to reduce (a) the significant direct impacts of the approved Project below a level of significance, and (b) the Approved Project's contribution to cumulative impacts to insignificant levels.

The Modified Project would not result in any additional individual or cumulative unmitigated significant adverse environmental impacts.

7. *An environmental justice screening analysis was conducted and the project, as mitigated, will not have a disproportionate impact on low-income or minority populations.* The Modified Project would not change the nature or level of impacts on low-income or minority populations.

8. *The Decision contains a discussion of the public benefits of the project as required by Public Resources Code section 25523(h).* The Modified Project would not change the public benefits contemplated by the Commission Decision. While the change in technology would result in a slight reduction in the workforce, this reduction would not be considered significant.

9. *The Decision contains measures to ensure that the planned, temporary, or unexpected closure of the project will occur in conformance with applicable laws, ordinances, regulations, and standards.* The Modified Project would not change the conditions related to closure.

10. *The proceedings leading to this Decision have been conducted in conformity with the applicable provisions of Commission regulations governing the consideration of an Application for Certification and thereby meet the requirements of Public Resources Code sections 21000 et seq. and 25500 et seq.* The Modified Project would have no impact on the previous proceedings and it is fully anticipated that the activities under the Amendment would be conducted in conformance with the applicable regulations.

SECTION 4 ENVIRONMENTAL ANALYSIS OF THE MODIFIED PROJECT

The Commission's Power Plant Siting Regulations require an amendment to discuss "…the impacts the modification may have on the environment and proposed measures to mitigate any significant adverse impacts" and "…the impact of the modification on the facility's ability to comply with applicable laws, ordinances, regulations, and standards" (Title 20, CCR, Sections 1769(a)(1)(E) and (F)). This section discusses the project-specific and cumulative environmental impacts and LORS conformance of the Modified Project compared with the Approved Project. The analysis is organized according to the technical areas evaluated during the licensing proceedings. Also included in this section is a discussion of whether the Modified Project would change the analysis of Project alternatives contained in the Commission Decision.

4.1 ALTERNATIVES

The Commission Decision included a comparison of the Approved Project to the No Project Alternative and a reasonable range of other alternatives that were designed to attain most of the basic Project objectives while avoiding or substantially lessening the Approved Project's significant effects. Approval of the Modified Project would not undermine the reasoning of, or substantially alter, the analysis of alternatives provided in the Commission Decision.

4.1.1 Project Objectives

Project alternatives were evaluated in light of the objectives of the Modified Project. The objectives of the Modified Project remain as described in the Commission Decision (Alternatives pages 1 and 2). The objectives are summarized below.

- To construct and operate an up to 663.5 MW renewable power generating facility in California capable of selling competitively priced renewable energy consistent with the needs of California utilities.
- To locate the facility in areas of high insolation with ground slopes of less than five percent.
- To provide clean, renewable electricity to support California's Renewable Portfolio Standard (RPS) Program.
- To assist in reducing its GHG emissions, as required by the California Global Warming Solutions Act.
- To contribute to the achievement of the 33 percent RPS target set by California's governor and legislature.
- To complete the review process in a timeframe that would allow the Applicant to start construction or meet the economic performance guidelines, by December 31, 2010, to potentially qualify for the 2009 ARRA cash grant in lieu of tax credits for certain renewable energy projects (Ex. 300, p. B.2-9).

At the time of the Commission Decision, the ARRA required that a project start construction or meet economic performance guidelines by December 31, 2010 in order to qualify for funding. On December 17, 2010, a bill was signed into law that extended this deadline to December 31, 2011 (Tax Relieve, Unemployment Insurance Reauthorization and Job Creation of 2010, Pub L. No. 111-312, sec 707, 124 Stat. 3296).

The Modified Project would utilize currently available PV technology and would modify phasing identified under the Approved Project to reduce access needs north of the railroad during Phase 1. As a result of these changes, the Modified Project is better positioned to meet these objectives than the Approved Project. As discussed below, the Modified Project would not result in additional significant adverse environmental impacts beyond those discussed for the Approved Project, and would reduce some of the impacts of the Approved Project.

4.1.2 Action Alternatives

In Alternatives Table 1 of the Commission Decision, potential Project alternatives were summarized and those that were and were not carried forward for detailed analysis were identified. Approval of the Modified Project would not change the evaluation of the site, technology, and other alternatives, or the conclusions drawn in the Commission Decision regarding the alternatives.

One technology alternative evaluated in the Commission Decision and eliminated from detailed consideration was Solar Photovoltaic Technology – Utility Scale. This alternative was not carried forward for detailed analysis because the initial evaluation demonstrated that it would not substantially reduce the impacts of the Approved Project. The Commission Decision's conclusion is consistent with the current analysis of the Modified Project, which shows that incorporation of solar PV technology into the Approved Project would somewhat reduce, but not substantially reduce, environmental impacts compared to the Approved Project.

The first alternative analyzed in detail in the Commission Decision was a 275 MW Reduced Acreage Alternative. Although this alternative would reduce many of the impacts of the Approved Project, the Commission rejected it because it would also reduce the benefits associated with (1) replacing fossil fuel-fired generation and (2) reducing the associated criteria pollutant and GHG emissions (Alternatives pages 7, 18). This conclusion is equally valid when the Reduced Acreage Alternative is compared to the Modified Project, because the latter would generate the same 663.5 MW of clean renewable energy, with no increase in environmental impacts, compared to the Approved Project.

The second alternative analyzed in detail in the Commission Decision was the Private Land Alternative. The Commission Decision concluded that although the Private Land Alternative would reduce some environmental impacts, it would increase others compared to the Approved Project, would present additional challenges because of the need to acquire many individual parcels from many different landowners, and would not meet the Project objective regarding schedule (Alternatives pages 14, 18). This conclusion is equally valid when the Private Land Alternative is compared to the Modified Project, because the latter would slightly reduce environmental impacts compared to the Approved Project and the Private Land Alternative still would not meet the Project objective regarding schedule.

4.1.3 No Project Alternative

The Commission evaluated the "no project alternative" in the application proceeding. The Commission Decision (page Alternatives 14-15) concluded:

> "If the "No Project" alternative were chosen, other solar renewable power plants may be built, and the impacts to the environment would likely be similar to those of the proposed Project because solar renewable technologies require large amounts of land and similar slope and solarity requirements as the proposed CSP Project. The "No Project" alternative may also lead to development of other non-solar renewable technologies to help achieve the California RPS.
>
> Additionally, if the "No Project" alternative were chosen, it is likely that additional gas-fired power plants would be built or that existing gas-fired plants could operate longer. If the Project were not built, California would not benefit from the reduction in greenhouse gases that this

> facility would provide. [California utilities] would not receive the 663.5 MW contribution to [the] renewable state-mandated energy portfolio (Ex. 300, p. B.2-14).”

This conclusion remains valid under the Modified Project.

4.2 AIR QUALITY

As described in detail below impacts of the Modified Project to air quality are expected to be less than or equal to those of the Approved Project and will remain less than significant.

4.2.1 Summary of Project Changes Related to Air Quality

While the SunCatcher area would be constructed using the methods and details provided in the Commission Decision, the addition of PV technology would require modifications in construction of the Modified Project. Details are included in Appendix B, and are summarized below.

- Reduction in Expected Truck Trips associated both with Deliveries and Construction Workers: The Modified Project construction workforce would be reduced as the need for the high quantities of assembly workers is specific to the SunCatcher. Similarly, because of their dimensions, the PV modules might be packaged more efficiently, reducing deliveries associated with the Modified Project.
- Phasing: The Modified Project would develop the area south of the railroad as part of Phase 1. This change in phasing would require the movement of the main services complex and substation to the area south of the railroad and would postpone the construction of the bridge to Phase 2, compared to beginning in Month 7 of the Approved Project.
- Road and Route Treatment: As with the Approved Project, the main access road would be paved and all other roads developed in the Modified Project would be treated with Soiltac or the equivalent. However, the length and quantities of roads would decrease under the Modified Project layout and many roads in the Approved Project would be replaced with unimproved module access points, which would require little to no development during construction.
- Total Mileage Decrease: As a result of moving the main services complex and on-site substation south of the railroad, the average distances traveled would be much shorter in the Modified Project than in the Approved Project. For example, the approximate distance from the Modified Project site entrance to the main services complex would be 2.2 miles, a shorter distance than that contemplated in the Approved Project.

For the Modified Project, operations in the SunCatcher area would be the same as described in the Commission Decision. The planned operation of the PV technology would be revised when compared to the Approved Project. Details are included in Appendix B, and are summarized below.

- Reduction in Expected Modified Project Operational Workforce: The Modified Project operational workforce would be reduced as the maintenance requirements for PV technology would be less than those contemplated for the Approved Project.
- Operational Fleet: The revised operational fleet would require fewer and smaller vehicles to conduct the mirror washing, inspections, and minor maintenance tasks. No significant changes would be made to the remaining maintenance fleet.

- Road and Route Treatment: As with the Approved Project, the main access road would be paved, and all other roads developed in the Modified Project would be treated with Soiltac or the equivalent. However, the length and quantities of roads would be decreased in the Modified Project layout, and many roads in the Approved Project would be replaced with unimproved module access points. The unimproved module access points would be utilized up to four times a year for maintenance and PV module washing.
- Washing Methods: PV modules would be washed using the unimproved module access points. The vehicle operator on these paths would park at one or two places along the access lane, exit the vehicle, and manually spray multiple PV modules with a spray wand. PV modules would be manually sprayed with a spray wand, via a water tank and hose reel attached to the PV Module Washing Truck. Washing methods for SunCatchers would not be changed.

4.2.2 Changes in Environmental Impacts

The Commission Decision concluded that there would be no significant impacts to air quality after mitigation. The Modified Project would result in emissions that would be less than or equal to the Approved Project for every criteria pollutant and GHG.

4.2.2.1 Construction

Criteria pollutant and GHG emissions generated from construction activities were calculated using revised information described above and shown in Appendix B, including revised vehicle inventory and travel distances. Tables 4.2-1 through 4.2-4 present the maximum criteria pollutant during the highest emitting month and highest emitting 12-month span, and GHG emissions estimated during the construction phase for the Modified Project.

Table 4.2-1
Estimated Daily Maximum Construction Emissions of Criteria Pollutants (lbs/day) for the Modified Project (Month 7)

Activity	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_x
On-Site Construction Emissions						
On-Site Combustion Emissions						
Construction Equipment	15.39	14.17	218.26	42.65	276.10	0.28
Worker Vehicles	0.26	0.20	18.11	1.25	1.69	0.03
Security Vehicles	0.01	0.01	1.47	0.04	0.02	0.01
On-site Generators	0.65	0.64	114.10	6.19	65.20	0.22
Bridge Construction Delivery Trucks	0.00	0.00	0.00	0.00	0.00	0.00
Other Delivery Trucks	1.68	1.50	14.47	5.32	27.20	0.03
Subtotal of On-site Combustion Emissions	17.98	16.51	366.41	55.45	370.22	0.56
On-Site Fugitive Emissions						
Construction Equipment	17.19	3.97				
Storage Piles	9.53	2.12				
Worker Vehicles	55.43	8.31				

Table 4.2-1
Estimated Daily Maximum Construction Emissions of Criteria Pollutants (lbs/day)
for the Modified Project (Month 7)
(Continued)

Activity	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_x
Security Vehicles	37.67	5.65				
On-site Generators	--	--				
Bridge Construction Delivery Trucks	0.00	0.00				
Other Delivery Trucks	273.23	37.52				
Subtotal of On-Site Fugitive Emissions	393.04	57.57				
Subtotal of On-Site Emissions	411.02	74.08	366.41	55.45	370.22	0.56
Off-Site On-Road Emissions						
Off-Site Combustion Emissions						
Worker Vehicles	1.77	0.98	143.20	4.27	17.12	0.17
Bridge Construction Delivery Trucks	0.00	0.00	0.00	0.00	0.00	0.00
Other Delivery Trucks	4.25	3.62	23.30	5.10	115.73	0.12
Subtotal of Off-Site Combustion Emissions	6.03	4.60	166.50	9.37	132.85	0.29
Off-Site Paved Road Fugitive Dust Emissions						
Worker Vehicles	12.16	1.82				
Bridge Construction Delivery Trucks	0.00	0.00				
Other Delivery Trucks	17.70	2.66				
Subtotal of Off-Site Fugitive Emissions	29.87	4.48				
Subtotal of Off-Site Emissions	35.89	9.08	166.50	9.37	132.85	0.29
Total Maximum Daily Emissions	446.92	83.16	532.91	64.82	503.07	0.85

Acronyms:
CO = carbon monoxide
lbs = pounds
NO_X = oxides of nitrogen
$PM_{2.5}$ = particles less than 2.5 micrometers in diameter
PM_{10} = particles 10 micrometers or less in diameter
ROG = reactive organic gas
SO_X = oxides of sulfur
-- = not applicable

Table 4.2-2
Estimated Maximum Annual Construction Emissions
of Criteria Pollutants (tons/year)
for the Modified Project (Month 2 to 13)

Activity	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_x
On-Site Construction Emissions						
On-Site Combustion Emissions						
Construction Equipment	2.189	2.015	28.156	6.106	38.006	0.039
Worker Vehicles	0.034	0.026	2.398	0.165	0.224	0.003
Security Vehicles	0.001	0.001	0.229	0.006	0.003	0.001
On-site Generators	0.102	0.099	17.799	0.966	10.171	0.034

Table 4.2-2
Estimated Maximum Annual Construction Emissions
of Criteria Pollutants (tons/year)
for the Modified Project (Month 2 to 13)
(Continued)

Activity	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_x
Bridge Construction Delivery Trucks	0.000	0.000	0.000	0.000	0.000	0.000
Other Delivery Trucks	0.293	0.262	2.488	0.941	4.761	0.006
Subtotal of On-site Combustion Emissions	2.62	2.40	51.07	8.18	53.17	0.08
On-Site Fugitive Dust Emissions						
Construction Equipment	2.38	0.57				
Storage Piles	0.87	0.19				
Worker Vehicles	7.34	1.10				
Security Vehicles	5.88	0.88				
On-site Generators	--	--				
Bridge Construction Delivery Trucks	0.00	0.00				
Other Delivery Trucks	48.12	6.56				
Subtotal of On-Site Fugitive Emissions	64.58	9.31				
Subtotal of On-Site Emissions	67.20	11.71	51.07	8.18	53.17	0.08
Off-Site On-Road Emissions						
Off-Site Combustion Emissions						
Worker Vehicles	0.23	0.13	18.96	0.57	2.27	0.02
Bridge Construction Delivery Trucks	0.00	0.00	0.00	0.00	0.00	0.00
Other Delivery Trucks	0.61	0.52	3.32	0.73	16.51	0.02
Subtotal of Off-Site Combustion Emissions	0.84	0.65	22.29	1.29	18.78	0.04
Off-Site Paved Road Fugitive Emissions						
Worker Vehicles	1.61	0.24				
Bridge Construction Delivery Trucks	0.00	0.00				
Other Delivery Trucks	2.53	0.38				
Subtotal of Off-Site Fugitive Emissions	4.14	0.62				
Subtotal of Off-Site Emissions	4.98	1.27	22.29	1.29	18.78	0.04
Total Maximum Annual Emissions	72.18	12.98	73.36	9.48	71.94	0.12

Acronyms:
CO =carbon monoxide
NO_X = oxides of nitrogen
$PM_{2.5}$ = particles less than 2.5 micrometers in diameter
PM_{10} = particles 10 micrometers or less in diameter
ROG = reactive organic gas
SO_X =oxides of sulfur
-- = not applicable

Table 4.2-3
Estimated Entire Construction Period Greenhouse Gases Emissions (metric tons) for the Modified Project

Activity	CO_2	CH_4	N_2O	CO_2e
On-Site Construction Emissions				
On-Site Combustion Emissions				
Construction Equipment	7,760.21	1.99	--	7,802.09
Worker Vehicles	846.46	0.08	0.08	871.70
Security Vehicles	110.51	0.01	0.00	111.68
On-site Generators	11,102.63	0.44	0.11	11,145.73
All Delivery Trucks	1,470.10	0.02	0.01	1,474.83
Subtotal of On-site Combustion Emissions	21,289.91	2.53	0.20	21,406.03
On-Site Fugitive Dust Emissions				
Construction Equipment				
Worker Vehicles				
Security Vehicles				
All Delivery Trucks				
Subtotal of On-Site Fugitive Emissions				
Subtotal of On-Site Emissions	21,289.91	2.53	0.20	21,406.03
Off-Site On-Road Emissions				
Off-Site Combustion Emissions				
Worker Vehicles	5,301.27	1.27	1.17	5,690.44
All Delivery Trucks	7,113.65	0.02	0.02	7,120.44
Subtotal of Off-Site Combustion Emissions	12,414.91	1.29	1.19	12,810.88
Off-Site Paved Road Fugitive Emissions				
Worker Vehicles				
All Delivery Trucks				
Subtotal of Off-Site Fugitive Emissions				
Subtotal of Off-Site Emissions	12,414.91	1.29	1.19	12,810.88
Total Entire Construction Period Emissions	33,704.82	3.83	1.39	34,216.91

Acronyms:
CO_2 = carbon dioxide
CO_2e = carbon dioxide equivalent
CH_4 = methane
N_2O = nitrous oxide
-- = not applicable

The construction emissions presented in Tables 4.2-1 through 4.2-3 are lower than the construction emissions calculated for the Approved Project.

4.2.2.2 Operation

Criteria pollutant emissions generated from operation of the Modified Project were estimated using the revised maintenance vehicle fleet appropriate to service both the SunCatchers and PV modules. Tables 4.2-4 and 4.2-5 present the maximum estimated operational air pollutant emissions from the Modified Project. GHG estimates for the operational phase of the Modified Project were also revised accordingly and are presented in Table 4.2-6. Detailed air emission calculations are presented in Appendix B.

Table 4.2-4
Estimated Daily Maximum Operational Emissions of Criteria Pollutants (lbs/day) for the Modified Project

Activity	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_x
On-Site Operational Emissions						
On-Site Combustion Emissions						
Diesel Generator	0.01	0.01	0.10	0.04	1.14	0.03
Maintenance and Security Vehicles and Equipment	0.33	0.27	96.75	17.02	5.21	0.13
Worker Vehicles	0.09	0.06	3.67	0.22	0.34	0.01
Visitor Cars and Delivery Trucks	0.03	0.03	0.56	0.13	0.57	0.00
Subtotal of On-Site Combustion Emissions	0.46	0.38	101.08	17.42	7.25	0.17
On-Site Fugitive Emissions						
Maintenance and Security Vehicles and Equipment	236.26	28.13				
Worker Vehicles	2.34	0.57				
Visitor Cars and Delivery Trucks	0.74	0.18				
Gasoline Tank	--	--	--	5.49	--	--
Subtotal of On-Site Fugitive Emissions	239.34	28.88	0.00	5.49	0.00	0.00
Subtotal of On-Site Emissions	239.80	29.27	101.08	22.92	7.25	0.17
Off-Site On-Road Emissions						
Off-Site Combustion Emissions						
Worker Vehicles	0.65	0.36	31.83	0.85	3.67	0.06
Visitor Cars and Delivery Trucks	0.44	0.33	7.50	0.54	8.81	0.02
Subtotal of Off-Site Combustion Emissions	1.09	0.69	39.34	1.39	12.48	0.09
Off-Site Paved Road Fugitive Emissions						
Worker Vehicles	7.98	1.96				
Visitor Cars and Delivery Trucks	4.84	1.19				
Subtotal of Off-Site Fugitive Emissions	12.82	3.15				
Subtotal of Off-Site Emissions	13.91	3.83	39.34	1.39	12.48	0.09
Total Maximum Emissions	253.71	33.10	140.41	24.30	19.74	0.26

Acronyms:
CO = carbon monoxide
NO_X =oxides of nitrogen
$PM_{2.5}$ = particles less than 2.5 micrometers in diameter
PM_{10} = particles 10 micrometers or less in diameter
ROG = reactive organic gas
SO_X = oxides of sulfur
-- = not applicable

Table 4.2-5
Estimated Annual Maximum Operational Emissions of Criteria Pollutants (tons/year)

Activity	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_x
On-Site Operational Emissions						
On-Site Combustion Emissions						
Diesel Generator	0.0001	0.0001	0.0006	0.0002	0.0068	0.0002
Maintenance and Security Vehicles and Equipment	0.05	0.04	14.10	2.39	0.83	0.02
Worker Vehicles	0.02	0.01	0.66	0.04	0.06	0.00
Visitor Cars and Delivery Trucks	0.00	0.00	0.05	0.01	0.02	0.00
Subtotal of On-Site Combustion Emissions	0.06	0.05	14.81	2.44	0.92	0.02
On-Site Fugitive Emissions						
Maintenance and Security Vehicles and Equipment	31.95	3.90				
Worker Vehicles	0.42	0.10				
Visitor Cars and Delivery Trucks	0.04	0.01				
Gasoline Tank	--	--	--	1.00	--	--
Subtotal of On-Site Fugitive Emissions	32.41	4.01	0.00	1.00	0.00	0.00
Subtotal of On-Site Emissions	32.47	4.07	14.81	3.44	0.92	0.02
Off-Site On-Road Emissions						
Off-Site Combustion Emissions						
Worker Vehicles	0.12	0.06	5.73	0.15	0.66	0.01
Visitor Cars and Delivery Trucks	0.02	0.02	0.79	0.03	0.33	0.00
Subtotal of Off-Site Combustion Emissions	0.14	0.08	6.52	0.18	0.99	0.01
Off-Site Paved Road Fugitive Emissions						
Worker Vehicles	1.44	0.35				
Visitor Cars and Delivery Trucks	0.28	0.07				
Subtotal of Off-Site Fugitive Emissions	1.71	0.42				
Subtotal of Off-Site Emissions	1.85	0.50	6.52	0.18	0.99	0.01
Total Maximum Emissions	34.33	4.57	21.33	3.62	1.91	0.03

Acronyms:
CO = carbon monoxide
NO_X = oxides of nitrogen
$PM_{2.5}$ = particles less than 2.5 micrometers in diameter
PM_{10} = particles 10 micrometers or less in diameter
ROG = reactive organic gas
SO_X = oxides of sulfur
-- = not applicable

Table 4.2-6
Estimated Annual Maximum Operational Greenhouse Gas Emissions (metric tonnes/year)

Activity	CO_2	CH_4	N_2O	SF_6	CO_2e
On-Site Operational Emissions					
On-Site Combustion Emissions					
Diesel Generator	0.81	0.00	0.00	0.00	0.82
Maintenance & Security Vehicles and Equipment	1,140.06	0.21	0.07	0.00	1,072.72
Worker Vehicles	145.01	0.01	0.01	0.00	149.13
Visitor Cars and Delivery Trucks	10.91	0.00	0.00	0.00	11.16
Potential SF_6 leakage emissions from proposed circuit breakers and other transmissions system equipment				0.02	384.42
Subtotal of On-Site Emissions	1,296.79	0.22	0.08	0.02	1,618.24
Off-Site On-Road Emissions					
Off-Site Combustion Emissions					
Worker Vehicles	990.04	0.23	0.21	0.00	1,059.28
Visitor Cars and Delivery Trucks	160.67	0.03	0.03	0.00	169.58
Subtotal of Off-Site Emissions	1,150.71	0.26	0.23	0.00	1,228.86
Total Maximum Emissions	2,447.50	0.48	0.31	0.02	2,847.10

Acronyms:
CO_2 = carbon monoxide
CO_2e = carbon monoxide equivalent
CH_4 = methane
NO_2 = nitrous oxide
SF_6 = sulfur hexafluoride

The operational emissions presented in Tables 4.2-4 through 4.2-6 are lower than the operational emissions calculated for the Approved Project.

In the Commission Decision, the Commission concluded that there would be no significant impacts to air quality after mitigation. The Modified Project would result in emissions that are less than the Approved Project for every criteria pollutant and GHG. Thus, the air quality impacts of the Modified Project are expected to be less than or equal to the impacts of the Approved Project.

4.2.3 Changes in Cumulative Environmental Impacts

The Modified Project would not result in additional cumulative environmental impacts because estimated air emissions would be less than or equal to emissions used in the cumulative assessment. As described in Section 4.23, Cumulative Scenario, no new reasonably foreseeable future actions beyond those assumed in the Commission Decision have been identified. Therefore, because the Modified Project would reduce emissions, the cumulative impacts to air quality are expected to be equal to or less than those disclosed in the Approved Project's record.

4.2.4 Changes in LORS Conformance and Other Permits

In the Commission Decision, the Commission concluded that, with the implementation of the Conditions, the Approved Project would comply with all applicable LORS. As with the Approved Project, the

Modified Project would comply with all applicable LORS, and no new or additional LORS have been identified.

The Approved Project received a final determination of compliance (DOC) from the Mojave Desert Air Quality Management District (MDAQMD) for the Approved Project's stationary sources. The MDAQMD has indicated that there is no need to revise or reissue a DOC because the pieces of equipment that were permitted (the backup diesel generator and fuel storage tank) would not change and the expected usage would not change.

4.2.5 Changes in Proposed Mitigation

Because the Modified Project would have fewer air quality impacts than the Approved Project, no additional mitigation measures would be required.

4.2.6 Changes in Conditions of Certification

The conforming changes to the Conditions for the Modified Project related to air quality are:

AQ-SC1 Air Quality Construction Mitigation Manager (AQCMM): The project owner shall designate and retain an on-site AQCMM who shall be responsible for directing and documenting compliance with Conditions of Certification **AQ-SC3, AQ-SC4** and **AQ-SC5** for the entire project site and linear facility construction. The on-site AQCMM may delegate responsibilities to one or more AQCMM Delegates. The AQCMM and AQCMM Delegates shall have full access to all areas of construction on the project site and linear facilities, and shall have the authority to stop any or all construction activities as warranted by applicable construction mitigation conditions. The AQCMM and AQCMM Delegates may have other responsibilities in addition to those described in this Condition. The AQCMM shall not be terminated without written consent of the Compliance Project Manager (CPM).

Verification: At least 30 days prior to ~~the start of ground disturbance~~Pre-Construction Site Mobilization, the project owner shall submit to the CPM for approval, the name, resume, qualifications, and contact information for the on-site AQCMM and all AQCMM Delegates.

AQ-SC2 Air Quality Construction Mitigation Plan (AQCMP): The project owner shall provide an AQCMP, for approval, which details the steps that will be taken and the reporting requirements necessary to ensure compliance with Conditions of Certification **AQ-SC3, AQ-SC4,** and **AQ-SC5.**

Verification: At least 30 days prior to ~~the start of any ground disturbance~~Pre-Construction Site Mobilization, the project owner shall submit the AQCMP to the CPM for approval. The AQCMP shall include effectiveness and environmental data for the proposed soil stabilizer. The CPM will notify the project owner of any necessary modifications to the plan within 15 days from the date of receipt.

AQ-SC3 Construction Fugitive Dust Control: The AQCMM shall submit documentation to the CPM in each Monthly Compliance Report that demonstrates compliance with the Air Quality Construction Mitigation Plan (AQCMP) mitigation measures for the purposes of minimizing fugitive dust emission creation from construction activities and preventing all fugitive dust plumes that would not comply with the performance standards identified in Condition **AQ-SC4** from leaving the project site. The following fugitive dust mitigation measures shall be included in the Air Quality Construction Mitigation Plan (AQCMP) required by **AQ-SC2,** and any deviation from the AQCMP mitigation measures shall require prior CPM notification and approval.

The main access roads through the facility to the power block areas will be either paved or stabilized using soil binders, or equivalent methods, to provide a stabilized surface that is similar for the purposes of dust control to paving, that may or may not include a crushed rock (gravel or similar material with fines removed) top layer, prior to initiating construction in the main power block area, and delivery areas for operations materials (chemicals, replacement parts, etc.) will be paved or treated prior to taking initial deliveries.

All unpaved construction roads and unpaved operation and maintenance site roads, as they are being constructed, shall be stabilized with a non-toxic soil stabilizer or soil weighting agent that can be determined to be both as efficient or more efficient for fugitive dust control as ARB approved soil stabilizers, and shall not increase any other environmental impacts including loss of vegetation to areas beyond where the soil stabilizers are being applied for dust control. All other disturbed areas in the project and linear construction sites shall be watered as frequently as necessary during grading (consistent with Biology Conditions of Certification that address the minimization of standing water); and after active construction activities shall be stabilized with a nontoxic soil stabilizer or soil weighting agent, or alternative approved soil stabilizing methods, in order to comply with the dust mitigation objectives of Condition of Certification **AQ-SC4.** The frequency of watering can be reduced or eliminated during periods of precipitation.

No vehicle shall exceed 10 miles per hour on unpaved areas within the construction site, with the exception that vehicles may travel up to 25 miles per hour on stabilized unpaved roads as long as such speeds do not create visible dust emissions.

Visible speed limit signs shall be posted at the construction site entrances.

All construction equipment vehicle tires shall be inspected and washed as necessary to be cleaned free of dirt prior to entering paved roadways.

Gravel ramps of at least 20 feet in length must be provided at the tire washing/cleaning station.

All unpaved exits from the construction site shall be graveled or treated to prevent track-out to public roadways.

All construction vehicles shall enter the construction site through the treated entrance roadways, unless an alternative route has been submitted to and approved by the CPM.

Construction areas adjacent to any paved roadway below the grade of the surrounding construction area or otherwise directly impacted by sediment from site drainage shall be provided with sandbags or other equivalently effective measures to prevent run-off to roadways, or other similar run-off control measures as specified in the Storm Water Pollution Prevention Plan (SWPPP), only when such SWPPP measures are necessary so that this condition does not conflict with the requirements of the SWPPP.

All paved roads within the construction site shall be swept daily or as needed (less during periods of precipitation) on days when construction activity occurs to prevent the accumulation of dirt and debris.

At least the first 500 feet of any paved public roadway exiting the construction site or exiting other unpaved roads en route from the construction site or construction staging areas shall be swept as needed (less during periods of precipitation) on days when construction activity occurs or on any other day when dirt or runoff resulting from the construction site activities is visible on the public paved roadways.

All soil storage piles and disturbed areas that remain inactive for longer than 10 days shall be covered, or shall be treated with appropriate dust suppressant compounds.

All vehicles that are used to transport solid bulk material on public roadways and that have potential to cause visible emissions shall be provided with a cover, or the materials shall be sufficiently wetted and loaded onto the trucks in a manner to provide at least 2 feet of freeboard.

Wind erosion control techniques (such as windbreaks, water, chemical dust suppressants, and/or vegetation) shall be used on all construction areas that may be disturbed. Any windbreaks installed to comply with this Condition shall remain in place until the soil is stabilized or permanently covered with vegetation.

Verification: The AQCMM shall provide the CPM a Monthly Compliance Report to include the following to demonstrate control of fugitive dust emissions:

A summary of all actions taken to maintain compliance with this Condition;

Copies of any complaints filed with the District in relation to project construction; and

C. Any other documentation deemed necessary by the, CPM or AQCMM to verify compliance with this Condition. Such information may be provided via electronic format or disk at the project owner's discretion.

AQ-SC4 Dust Plume Response Requirement: The AQCMM or an AQCMM Delegate shall monitor all construction activities for visible dust plumes. Observations of visible dust plumes that have the potential to be transported (A) off the project site and within 400 feet upwind of any regularly occupied structures not owned by the project owner or (B) 200 feet beyond the centerline of the construction of linear facilities

indicate that existing mitigation measures are not resulting in effective mitigation. The AQCMP shall include a section detailing how the additional mitigation measures will be accomplished within the time limits specified. The AQCMM or Delegate shall implement the following procedures for additional mitigation measures in the event that such visible dust plumes are observed:

Step 1: The AQCMM or Delegate shall direct more intensive application of the existing mitigation methods within 15 minutes of making such a determination.

Step 2: The AQCMM or Delegate shall direct implementation of additional methods of dust suppression if Step 1, specified above, fails to result in adequate mitigation within 30 minutes of the original determination.

Step 3: The AQCMM or Delegate shall direct a temporary shutdown of the activity causing the emissions if Step 2, specified above, fails to result in effective mitigation within one hour of the original determination. The activity shall not restart until the AQCMM or Delegate is satisfied that appropriate additional mitigation or other site conditions have changed so that visual dust plumes will not result upon restarting the shutdown source. The owner/operator may appeal to the CPM any directive from the AQCMM or Delegate to shut down an activity, if the shutdown shall go into effect within one hour of the original determination, unless overruled by the CPM before that time.

Verification: The AQCMM shall provide the CPM a Monthly Compliance Report to include:

a summary of all actions taken to maintain compliance with this Condition;

copies of any complaints filed with the District in relation to project construction; and

C. any other documentation deemed necessary by the CPM or AQCMM to verify compliance with this Condition. Such information may be provided via electronic format or disk at the project owner's discretion.

AQ-SC5 Diesel-Fueled Engine Control: The AQCMM shall submit to the CPM, in the Monthly Compliance Report, a construction mitigation report that demonstrates compliance with the AQCMP mitigation measures for purposes of controlling diesel construction-related emissions. The following off-road diesel construction equipment mitigation measures shall be included in the Air Quality Construction Mitigation Plan (AQCMP) required by **AQ-SC2,** and any deviation from the AQCMP mitigation measures shall require prior CPM notification and approval.

All diesel-fueled engines used in the construction of the facility shall have clearly visible tags issued by the on-site AQCMM showing that the engine meets the conditions set forth herein.

All construction diesel engines with a rating of 50 hp or higher shall meet, at a minimum, the Tier 3 California Emission Standards for Off-Road Compression-Ignition Engines, as specified in California Code of Regulations, Title 13, section

2423(b)(1), unless a good faith effort to the satisfaction of the CPM that is certified by the on-site AQCMM demonstrates that such engine is not available for a particular item of equipment. In the event that a Tier 3 engine is not available for any off-road equipment larger than 50 hp, that equipment shall be equipped with a Tier 2 engine, or an engine that is equipped with retrofit controls to reduce exhaust emissions of nitrogen oxides (NOX) and diesel particulate matter (DPM) to no more than Tier 2 levels unless certified by engine manufacturers or the on-site AQCMM that the use of such devices is not practical for specific engine types. For purposes of this Condition, the use of such devices is "not practical" for the following, as well as other, reasons.

There is no available retrofit control device that has been verified by either the California Air Resources Board or U.S. Environmental Protection Agency to control the engine in question to Tier 2 equivalent emission levels and the highest level of available control using retrofit or Tier 1 engines is being used for the engine in question; or

The construction equipment is intended to be on site for 10 days or less.

3. The CPM may grant relief from this requirement if the AQCMM can demonstrate a good faith effort to comply with this requirement and that compliance is not practical.

c. The use of a retrofit control device may be terminated immediately, provided that the CPM is informed within 10 working days of the termination and that a replacement for the equipment item in question meeting the controls required in item "b" occurs within 10 days of termination of the use, if the equipment would be needed to continue working at this site for more than 15 days after the use of the retrofit control device is terminated, if one of the following conditions exists :

The use of the retrofit control device is excessively reducing the normal availability of the construction equipment due to increased down time for maintenance, and/or reduced power output due to an excessive increase in back pressure.

The retrofit control device is causing or is reasonably expected to cause engine damage.

The retrofit control device is causing or is reasonably expected to cause a substantial risk to workers or the public.

Any other seriously detrimental cause which has the approval of the CPM prior to implementation of the termination.

d. All heavy earth-moving equipment and heavy-duty construction-related trucks with engines meeting the requirements of (b) above All diesel heavy construction equipment shall not idle for more than five minutes. Vehicles that need to idle as part of their normal operation (such as concrete trucks) are exempted from this requirement.

Construction equipment will employ electric motors when feasible.

Verification: The AQCMM shall include in the Monthly Compliance Report the following to demonstrate control of diesel construction-related emissions:

A summary of all actions taken to control diesel construction related emissions;

A list of all heavy equipment used on site during that month, including the owner of that equipment and a letter from each owner indicating that equipment has been properly maintained; and

C. Any other documentation deemed necessary by the CPM, or the AQCMM to verify compliance with this Condition. Such information may be provided via electronic format or disk at the project owner's discretion.

AQ-SC6 The project owner, when obtaining dedicated on-road or off-road vehicles for ~~mirror~~mirrorand PV panel washing activities and other facility maintenance activities, shall only obtain vehicles that meet California on-road vehicle emission standards or appropriate U.S.EPA/California off-road engine emission standards for the latest model year available when obtained.

Verification: At least 30 days prior to the start of commercial operation, the project owner shall submit to the CPM a copy of the plan that identifies the size and type of the on-site vehicle and equipment fleet and the vehicle and equipment purchase orders and contracts and/or purchase schedule. The plan shall be updated every other year and submitted in the Annual Compliance Report.

AQ-SC7 The project owner shall provide a site Operations Dust Control Plan, including all applicable fugitive dust control measures identified in the verification of **AQ-SC3** that would be applicable to minimizing fugitive dust emission creation from operation and maintenance activities and preventing all fugitive dust plumes that would not comply with the performance standards identified in **AQ-SC4** from leaving the project site; that:

A. describes the active operations and wind erosion control techniques such as windbreaks and chemical dust suppressants, including their ongoing maintenance procedures, that shall be used on areas that could be disturbed by vehicles or wind anywhere within the project boundaries; and

B. identifies the location of signs throughout the facility that will limit traveling on unpaved portion of roadways to solar equipment maintenance vehicles only. In addition, vehicle speed shall be limited to no more than 10 miles per hour on these unpaved roadways, with the exception that vehicles may travel up to 25 miles per hour on stabilized unpaved roads as long as such speeds do not create visible dust emissions.

The site operations fugitive dust control plan shall include the use of durable non-toxic soil stabilizers on all regularly used unpaved roads and disturbed off-road areas, or alternative methods for stabilizing disturbed off-road areas, within the project boundaries, and shall include the inspection and maintenance procedures that will be undertaken to ensure that the unpaved roads remain

stabilized. The soil stabilizer used shall be a non-toxic soil stabilizer or soil weighting agent that can be determined to be either as efficient or more efficient for fugitive dust control as ARB approved soil stabilizers, and shall not increase any other environmental impacts including loss of vegetation to areas beyond where the soil stabilizers are being applied for dust control.

The performance and application of the fugitive dust controls shall also be measured against and meet the performance requirements of condition **AQ-SC4.** The measures and performance requirements of **AQ-SC4** shall also be included in the operations dust control plan.

Verification: At least 30 days prior to start of commercial operation, the project owner shall submit to the CPM for review and approval a copy of the site Operations Dust Control Plan that identifies the dust and erosion control procedures, including effectiveness and environmental data for the proposed soil stabilizer, that will be used during operation of the project and that identifies all locations of the speed limit signs.

Within 60 days after commercial operation, the project owner shall provide to the CPM a report identifying the locations of all speed limit signs, and a copy of the project employee and contractor training manual that clearly identifies that project employees and contractors are required to comply with the dust and erosion control procedures and on-site speed limits.

AQ-SC8 The project owner shall provide the CPM copies of all District issued Authority-to-Construct (ATC) and Permit-to-Operate (PTO) documents for the facility.

The project owner shall submit to the CPM for review and approval any modification proposed by the project owner to any project federal air permit. The project owner shall submit to the CPM any modification to any permit proposed by the District or U.S. Environmental Protection Agency (U.S. EPA), and any revised federal permit issued by the District or U.S. EPA, for the project.

Verification: The project owner shall submit any ATC, PTO, and proposed federal air permit modifications to the CPM within five working days of its submittal either by 1) the project owner to an agency, or 2) receipt of proposed modifications from an agency. The project owner shall submit all modified ATC/PTO documents and all federal air permits to the CPM within 15 days of receipt.

AQ-SC9 The project owner shall only use Tier 3 or higher certified engine generators, totaling no more than 900 horsepower, to provide project site power prior to the installation of utility construction or permanent electric power lines to the project site. These engines shall be in the range of 50 to 750 hp each and will have NOx emissions that are certified under full load to be no more than 3.5 grams per brake horsepower for engines between 50 and 100 horsepower and no more than 3.0 grams per brake horsepower for engines between 100 and 750 horsepower. This requirement does not include small engine generators that are solely dedicated to specific pieces of equipment, such as engine generators necessary for welders.

Verification: The project owner shall submit data on the site power generators, at least 15 days prior to their use, that demonstrates compliance with this condition.

DISTRICT CONDITIONS

DISTRICT FINAL DETERMINATION OF COMPLIANCE CONDITIONS (MDAQMD 2010a)

District conditions **AQ-1** through **AQ-15** are CEQA-only required Conditions.

Application No, 000010423 (Emergency Generator)

EQUIPMENT DESCRIPTION:

ARB Certified III engine, 399 bhp, fueled on ARB diesel, powering an electrical generator.

AQ-1 ~~Engine~~The emergency generator engine may operate in response to notification of impending rotating outage if the area utility has ordered rotating outages in the area where the engine is located or expects to order such outages at a particular time, the engine is located in the area subject to the rotating outage, the engine is operated no more than 30 minutes prior to the forecasted outage, and the engine is shut down immediately after the utility advises that the outage is no longer imminent or in effect.

Verification: The project owner shall maintain emergency generator engine operating records as required in **AQ-6** and shall make the site available for inspection of records by representatives of the District, ARB, and the Energy Commission.

AQ-2 ~~This unit~~The emergency generator engine shall only be fired on ultra-low sulfur diesel fuel, whose sulfur concentration is less than or equal to 0.0015 percent (15 ppm) on a weight per weight basis per ARB Diesel or equivalent requirements.

Verification: The project owner shall maintain the fuel sulfur content records for diesel fuel deliveries on site as required in **AQ-6** and shall make the site available for inspection of records by representatives of the District, ARB, and the Energy Commission.

AQ-3 ~~This equipment~~The emergency generator engine shall be installed, operated and maintained in strict accord with those recommendations of the manufacturer/supplier and/or sound engineering principles which produce the minimum emissions of contaminants. Unless otherwise noted, ~~this equipment~~the engine shall also be operated in accordance with all data and specifications submitted with the application for this permit.

Verification: The project owner shall make the site available for inspection of records by representatives of the District, ARB, and the Energy Commission.

AQ-4 A non-resettable four-digit (9,999) hour timer shall be installed and maintained on ~~this unit~~the emergency generator engine to indicate elapsed engine operating time.

Verification: The project owner shall make the site available for inspection by representatives of the District, ARB, and the Energy Commission.

AQ-5 ~~This unit~~The project shall be allowed to utilize the emergency generator engine until the project receives permanent power from SCE. Once permanent power has been supplied, the emergency generator engine shall be limited to use for emergency power, defined as in response to a fire or when commercially available power has been interrupted. In addition, ~~this unit~~the engine shall be operated no more than 50 hours per year, and no more than 0.5 hours per day for testing and maintenance, excluding compliance source testing. Time required for source testing will not be counted toward the 50 hour per year limit.

Verification: The project owner shall maintain engine use records on site as required in **AQ-6** and shall make the site available for inspection of records by representatives of the District, ARB, and the Energy Commission.

AQ-6 The project owner shall maintain an operations log for ~~this unit~~the emergency generator engine current and on-site (or at a central location) for a minimum of five years, and this log shall be provided to District, State and Federal personnel upon request. The log shall include, at a minimum, the information specified below:

Date of each use and duration of each use (in hours);

Reason for use (testing & maintenance, emergency, required emission testing); Calendar year operation in terms of fuel consumption (in gallons) and total hours; and,

Fuel sulfur concentration (the project owner may use the supplier's certification of sulfur content if it is maintained as part of this log).

Verification: The project owner shall submit records required by this Condition that demonstrating compliance with the sulfur content and engine use limitations of Conditions **AQ-2** and **AQ-5** in the Annual Compliance Report (**COMPLIANCE-8),** including a photograph showing the annual reading of engine hours. The project owner shall make the site available for inspection of records by representatives of the District, ARB, and the Energy Commission.

AQ-7 This gen-set is subject to the requirements of the Airborne Toxic Control Measure (ATCM) for Stationary Compression Ignition Engines (Title 17 CCR 93115). In the event of conflict between these Conditions and the ATCM, the more stringent requirements shall govern.

Verification: The project owner shall submit the engine specifications at least 30 days prior to purchasing the engines for review and approval demonstrating that the engines meet both ATCM and New Source Performance Standard (NSPS) subpart IIII emission limit requirements at the time of engine purchase. The project owner shall make the site available for inspection of records by representatives of the District, ARB, and the Energy Commission.

AQ-8 ~~This unit~~The emergency generator engine shall not be used to provide power during a voluntary agreed to power outage and/or power reduction initiated under an Interruptible Service Contract (ISC); Demand Response Program (DRP); Load Reduction Program (LRP) and/or similar arrangement(s) with the electrical power supplier.

Verification: The project owner shall make the site available for inspection of records by representatives of the District, ARB, and the Energy Commission.

Application No. 00010422 (5,000 gallon Above Ground Non-Retail Gasoline Dispensing Facility)

EQUIPMENT DESCRIPTION:

5,000 gallon capacity gasoline tank with Phase I and Phase II vapor recovery.

AQ-9 The toll-free telephone number that must be posted is 1 -800-635-4617.

Verification: The project owner shall make the site available for inspection of records by representatives of the District, ARB, and the Energy Commission.

AQ-10 The project owner shall maintain a log of all inspections, repairs, and maintenance on equipment subject to Rule 461. Such logs or recordsshall be maintained at the facility for at least two years and shall be available to the District upon request.

Verification: The project owner shall make the site available for inspection of records by representatives of the District, ARB, and the Energy Commission.

AQ-11 Any modifications or changes to the piping or control fitting of the vapor recovery system require prior approval from the District.

Verification: The project owner shall make the site available for inspection of records by representatives of the District, ARB, and the Energy Commission.

AQ-12 The vapor vent pipes are to be equipped with pressure relief valves.

Verification: The project owner shall make the site available for inspection of records by representatives of the District, ARB, and the Energy Commission.

AQ-13 The project owner shall perform the following tests ~~within 60 days of construction completion and annually thereafter~~ in accord with the following test procedures:

Static Pressure Decay Test per ARB test method TP-201 .3B (2-inch test);

Dynamic Back Pressure test per TP-201 .4;

Liquid Removal Test (if applicable) per TP-201 .6;

Fuel dispensing rate not to exceed 10 gpm, verified per EO G-70-200-C Exhibit 4, and;

e. Emergency vents and manways shall be leak free when tested at the operating pressure of the tank in accordance with ARB test methods, as specified in Title 17, California Code of Regulations.

~~The District shall be notified a minimum of~~**Verification:** Within 60 days of completion of project construction and annually thereafter, the project owner shall notify the District at least 10 days prior to performing the required tests ~~with the final~~. The test results shall be submitted to the

District within 30 days of completion of the tests~~.~~ and shall be made available to the CPM if requested. The District shall receive passing test reports no later than six weeks prior to the expiration date of this permit.

~~**Verification:** The project owner shall notify the District at least 10 days prior to performing the required tests. The test results shall be submitted to the District within 30 days of completion of the tests and shall be made available to the CPM if requested.~~

AQ-14 The annual throughput of gasoline shall not exceed 500,000 gallons per year. Throughput Records shall be kept on site and available to District personnel upon request. Before this annual throughput can be increased the facility may be required to submit to the District a site specific Health Risk Assessment in accord with a District approved plan. In addition public notice and/or comment period may be required.

Verification: The project owner shall submit to the CPM gasoline throughput records demonstrating compliance with this Condition as part of the Annual Compliance Report .The project owner shall maintain on site the annual gasoline throughput records and shall make the site available for inspection of records by representatives of the District, ARB, and the Energy Commission.

AQ-15 The project owner shall; install, maintain, and operate this equipment in compliance with ARB Executive Order G-70-200-C or Enhanced Vapor Recovery (EVR) Phase I and EVR Phase II, and Standing Loss requirements in affect at the time of construction.

Verification: The project owner shall make the site available for inspection of records by representatives of the District, ARB, and the Energy Commission.

4.2.7 References Cited

No references other than those presented in the Approved Project's record were used in the preparation of this analysis.

4.3 GEOLOGICAL RESOURCES AND HAZARDS

As described in detail below, impacts of the Modified Project to geological resources are expected to be less than or equal to those of the Approved Project and will remain less than significant.

4.3.1 Summary of Project Changes Related to Geologic Resources and Hazards

Changes to the Approved Project that require consideration with respect to geologic resources and hazards, as well as impacts to the Modified Project from geological hazards, are described below.

- The main services complex and on-site substation would be relocated south of the railroad.
- PV Tracker Blocks have smaller, more numerous, posts compared to 24-inch-diameter SunCatcher pedestals. The diameters of the posts would be between 4.5 inches and 6 inches. Both the 4.5-inch and the 6-inch steel posts generally project 5 to 6 feet above the ground and are vibrated to an equivalent depth into the ground.
- Locations and sizes of certain roads would be altered due to changes in the Modified Project layout.

4.3.2 Changes in Environmental Impacts

The Commission Decision concluded that most potential geologic hazards would pose a low or negligible risk to the Approved Project, and that significant geologic and mineral resources are not likely to be present at the Approved Project site. Given that the most likely geologic hazards are ground shaking, flash flooding and volcanic activity; the Commission concluded that these would be effectively mitigated by the standard engineering design measures required as part of Conditions GEN-1, GEN-5 and CIVIL-1, or could be managed within the Approved Project operations.

A potential for surface fault rupture along the Lavic Lake and Pisgah faults is present on the Project site. However, the new location of the main services complex within the Modified Project is not expected to increase or decrease risk from fault rupture. The main services complex would be moved from the east to the west side of the main Lavic Lake fault trace, and the on-site substation would be moved further to the east side of the site (see Figure 5.3-1). Available geologic information suggests that the new locations of the primary facilities would not be in proximity to the known active fault traces. Condition GEO-1 was implemented for the Approved Project to demonstrate that the facilities are in acceptable locations and not located within 50 feet of an established fault trace or any identified splays. During the compliance proceedings associated with the Approved Project, Condition GEO-1 was determined to be satisfied because no occupied buildings were to be constructed within 50 feet of the fault lines, as mapped by the State of California Department of Mines and Geology. As with the Approved Project, occupied facilities associated with the Modified Project would not be situated within 50 feet of the fault lines.

4.3.3 Changes in Cumulative Environmental Impacts

The Commission Decision concluded that no geological hazards would be associated with cumulative impacts. The Modified Project would not result in additional cumulative environmental impacts because

the proposed rate and amount of groundwater withdrawal would remain unchanged and incremental impacts on geologic and mineral resources would be the same. As described in Section 4.23, Cumulative Scenario, no new reasonably foreseeable future actions beyond those assumed in the Commission Decision have been identified. Therefore, the Modified Project's cumulative impacts to geological hazards are expected to be equal to or less than those disclosed in the Approved Project's record.

4.3.4 Changes in LORS Conformance and Other Permits

In the Commission Decision, the Commission concluded that, with the implementation of the Conditions, the Approved Project would comply with all applicable LORS. The Commission identified the LORS listed below associated with geologic hazards.

- 2007 California Building Code (CBC) – Identifies standards used in project investigation, design and construction.
- Alquist-Priolo Earthquake Fault Zoning Act – Requires a geologic investigation signed by a licensed engineering geologist to demonstrate that proposed buildings will not be constructed across active faults.
- The Seismic Hazards Mapping Act – Identifies areas subject to the effects of strong ground shaking.
- San Bernardino 2007 Development Code – Includes requirements for geologic/geotechnical studies.

Since the time of the Commission Decision, the 2010 CBC has superseded the 2007 CBC. As with the Approved Project, the Modified Project would comply with all these LORS, including the 2010 CBC, and no additional LORS related to geological hazards have been identified.

A grading permit from the County of San Bernardino Land Use Services Department, Building & Safety Division would be required for both the Approved Project and the Modified Project. This grading permit would be obtained prior to construction of the Modified Project. The Modified Project would not require any additional permits beyond those identified for the Approved Project.

4.3.5 Changes in Proposed Mitigation

No new or more severe impacts requiring additional mitigation would result from the Modified Project. The mitigation measures proposed in the Commission Decision would mitigate impacts associated with the Modified Project to levels that would be less than significant.

4.3.6 Changes in Conditions of Certification

In its Commission Decision, the Commission listed Conditions GEO-1, GEO-2 and GEO-3, and referred to GEN-1, GEN-5 and CIVIL-5 with respect to geologic hazards and resources. These Conditions are listed below. Minor modifications have been made to Conditions GEN-1, GEN-5 and CIVIL-1 to note the change from the 2007 CBC to 2010 CBC.

The conforming changes to the Conditions for the Modified Project related to geological hazards are:

GEO-1 The two Alquist-Priolo faults (Pisgah fault and the Lavic Lake fault) shall be located (if actually present) by trenching or suitable geophysical methods with sufficient accuracy and confidence to assure that no occupied structures are placed within 50 feet, either side, of an established fault trace or any identified splays. Other structures deemed critical to the project, by the owner, may also be set back, as practical, prudent and appropriate. ~~[~~

Verification: At least 30 days prior to ~~ground breaking (prior to final project design)~~Pre-Construction Site Mobilization the project owner shall submit a fault evaluation report signed and stamped by a geologist licensed in the state of California. The evaluation shall include sufficient field exploration to establish whether or not either or both faults (or their splays) extend onto the project site. Surveyed locations shall be obtained for any faults encountered and a map showing the fault locations in relation to project structures shall be provided. Onsite faults shall be considered active unless conclusive field evidence shows otherwise.

GEO-2 Because of the embankments on the downhill side, the proposed storm water detention basins constitute detention dams, some of which may be large enough to be under the jurisdiction of the State of California, Department of Water Resources, Division of Safety of Dams. Each detention dam site shall be characterized in a geotechnical investigation to establish foundation conditions and assess geologic hazards that affect embankment design. Appropriate geotechnical recommendations shall be provided for use in design and construction of the embankments and the associated storage area. All dams must be designed by a California licensed geotechnical or civil engineer familiar with design of small dams.

Verification: At least 60 days prior to ground breaking for the detention basins, the project owner shall submit a geotechnical investigation report covering each proposed detention basin. Appropriate geotechnical recommendations and specifications shall be provided for use in design and construction of the embankments and the associated storage area. All detention
facilities can be included in a single report or in the overall final project geotechnical report. One set of stamped design drawings, typical of the detention dams, must be submitted by the project owner, prior to starting detention dam construction.

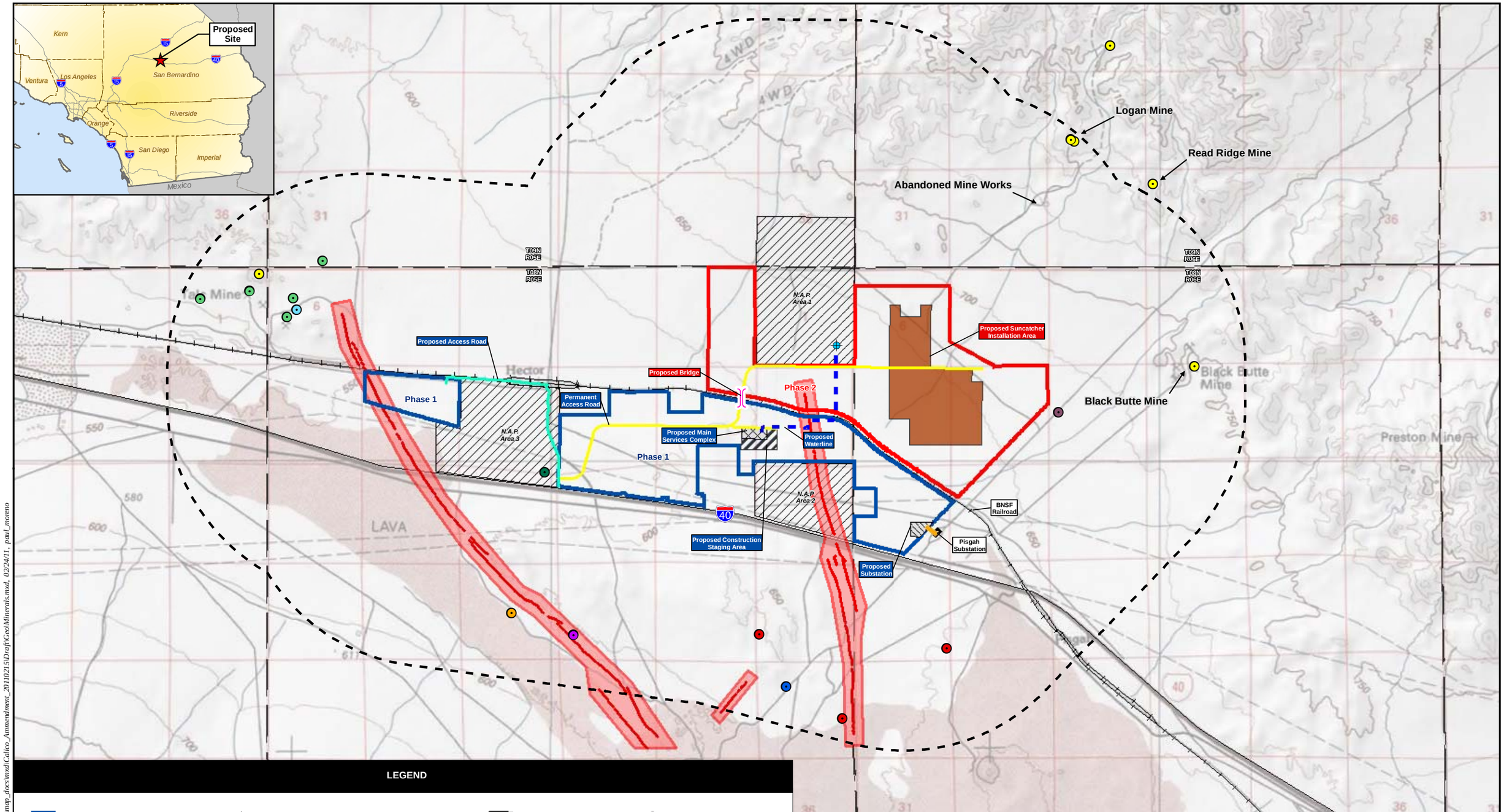
GEO-3 The California Department of Water Resources, Division of Safety of Dams has jurisdiction over proposed and existing dams that impound 50 acre-feet of water or more. Embankments six feet high or less are excluded, regardless of storage capacity and embankments impounding less than 15 acre-feet of water are excluded, regardless of height. Any detention basin meeting the Division of Safety of Dams jurisdictional criteria for a dam shall be permitted through that agency.

Verification: If final detention basin design results in no jurisdictional dams, the project owner shall submit a letter of verification from the design engineer. If one or more detention basins fall within the jurisdiction of the Division of Safety of Dams, the project owner shall

submit copies of the permit application(s) to the Division of Safety of Dams. Upon completion of construction of jurisdictional dams, the project owner shall submit copies of acceptance documents from the Division of Safety of Dams.

4.3.7 References Cited

California Building Standards Commission. California Code of Regulations, Title 24, Part 2. 2010 California Building Code. ISBN 978-1-58001-974-3. June 2010.



LEGEND

- Phase 1 (2,144 ac)
- Phase 2 (2,469 ac)
- N.A.P. (Not a Part)
- Proposed Substation
- Proposed Main Services Complex
- Proposed Suncatcher Installation Area
- Proposed Construction Staging Area
- Well
- Proposed Bridge
- Proposed Transmission Line
- Proposed Waterline
- Proposed Access Road
- Temporary Construction and Permanent Access Road
- Township/Range Boundary
- 2-mile Buffer
- Alquist Priolo Faults
- Alquist Priolo Zone

Mineral Resources

- Bentonite
- Boron-Borates
- Clay
- Copper
- Manganese
- Pumice
- Sand and Gravel, Construc
- Stone, Dimension
- Talc-Soapstone

SOURCES: Following layers from Westwood Design, Feb. 2011: project boundary, phases, well, waterline, t-line, substation, bridge, main services complex, staging area, access roads, N.A.P., installation area. Following layers from BLM, 2009: acquired lands, land and water conservation fund, township/range. Tiger, 2010: railroads, highways ESRI, 2010: Overview map. USGS 7.5' quads (Hector 1992, Sleeping Beauty 1993; faults, geology, minerals, 2007).

ALQUIST-PRIOLO EARTHQUAKE FAULT ZONE MAP CALICO SOLAR

URS

2500 0 2500 5000 Feet

SCALE: 1" = 5000' (1:60,000)
SCALE CORRECT WHEN PRINTED AT 11X17

CREATED BY: PM	DATE: Feb 2011	FIG. NO:
PM: AL	PROJ. NO: 27651022.01000	4.3-1

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4.4 SOILS

The following paragraphs describe the potential changes in erosion-related soil loss within the boundaries of the Project site under the Modified Project as compared to the Approved Project using the Revised Universal Soil Loss Equation,Version 2 (RUSLE2) model.

4.4.1 Summary of Project Changes Related to Soils

This section specifically addresses potential changes in soil loss caused by sheet and rill erosion and wind erosion. Section 4.5.2.1, Water Resources (Stormwater: Flooding, Erosion and Sedimentation) below, addresses the overall potential for change in erosion and sedimentation impacts under the Modified Project as compared to the Approved Project.

Section 4.5, Water Resources, describes the following elements of the Modified Project that are relevant to soil erosion:

- addition of inverter pads;
- replacement of a majority of the SunCatchers with PV modules (coverage, orientation, location, spacing and size of posts);
- grading configuration and disturbance;
- number and types of access roads; and
- relocation of the main services complex and on-site substation south of the railroad.

These elements of the Modified Project, which are described in greater detail in Section 4.5.2.1, have been taken into account in the updated RUSLE2 analysis summarized below.

4.4.2 Changes in Environmental Impacts

The Commission Decision stated that the planned construction activities for the Approved Project, including excavation, grading, road construction and foundation installation, could result in soil loss and compaction, as well as loss of soil productivity. The level of impact would depend significantly on the exposure to wind and water. The Commission concluded that implementation of erosion control measures identified in the Conditions, including Best Management Practices (BMPs), development and implementation of grading plans, and implementation of a Drainage Erosion and Sedimentation Control Plan (DESCP) would be sufficient to reduce the potential erosion and sedimentation impacts to less than significant levels.

Soil loss associated with the Approved Project, both during and after construction, was evaluated during the licensing proceedings using the RUSLE2 and the Wind Erosion Prediction System. Sheet and rill erosion due to storm water runoff was estimated for existing conditions, the construction phase with no BMPs, the construction phase with BMPs, and the operational phase with BMPs on a tons per acre per year basis.

Under the Modified Project, the construction- and operation-phase activities that could potentially generate changes in soil-related impacts would be equivalent to those described in the Commission Decision. In particular, during the construction phase, under the Modified Project, limited grading (cut and fill) would be required for PV module and SunCatcher installation, roadways, bridge construction, fencing, building foundations, inverter pad foundations, and evaporation ponds. Likewise, other items required for construction of the main services complex and various other site installation items would be similar under the Approved Project and Modified Project. Table 4.5-1, in Section 4.5, describes disturbance acreages for the Modified Project. The Modified Project grading would be equivalent to or less than that identified in the Approved Project. Additionally, PV module-related maintenance activities would be significantly reduced in frequency. SunCatchers require more frequent maintenance (including mirror washing) than PV modules. Less frequent vehicle traffic for PV module maintenance would result in less ground disturbance. A SWPPP would be prepared to provide BMP measures to mitigate any potential for soil loss resulting from the Modified Project. Similarly, an operation-phase industrial SWPPP and BMPs would be prepared and implemented to ensure that no significant water quality impacts would occur during operation. Based on soil loss estimate calculations, it is expected that the construction- and operation-phase soil losses, if with implementation of the same or similar BMPs as those proposed for the Approved Project, would not significantly change under the Modified Project.

Updated soil loss calculations are provided in Appendix C. The soil loss calculations provide an estimate of the amount of expected soil loss for existing conditions, and construction and operation phases, with and without BMPs. The estimated soil loss is expressed in tons per acre per year. A broader range of site slopes and overland flow lengths are anticipated to be encountered under the Modified Project due to the increased cover of the PV modules, and decrease in the spacing of the PV module post supports. Therefore, expanded ranges of flow path lengths and slope steepness were included in the modeling for the Modified Project. The existing and proposed typical site slope lengths and overland flow lengths were based on: 1) existing and proposed site slopes, 2) slope lengths required to produce concentrated flow that would likely result in erosion for a particular slope (i.e., concentrated flow would likely begin to occur on a slope of 0.5 percent within 50 feet, or on a slope of 5 percent within 100 feet). The Approved Project estimated soil loss rates represented a conservative condition, with an overland flow path length of 150 feet and an average slope steepness of 5 percent. Additional calculations were performed for the Modified Project that included overland flow path lengths of 50 feet, a slope steepness of 0.5 percent, and a 100-foot overland flow length with a steepness of 5 percent for construction and operation conditions, to provide a broader range of conditions that could be encountered during construction.

The results of the revised soil loss calculations indicated that the estimated soil loss rates under the Modified Project, with the implementation of construction- and operation-phase BMPs, are in some cases less than but not significantly different from those expected under the Approved Project. The BMPs, to be specifically identified in the DESCP, construction SWPPP, and industrial SWPPP, would be effective at reducing potential soil loss during construction to existing condition levels. Similarly, soil loss due to wind erosion is not expected to significantly change with implementation of wind erosion control BMPs. The Project Owner does not plan to apply soil stabilizer or soil weighting agents on unimproved module access points because of their infrequent use. However, significant soil loss is not expected to occur in the absence of soil stabilizers or soil weighting agents between the PV modules because these areas would only be accessed approximately four times per year for PV module washing and occasional maintenance.

This level of infrequent and time-distributed access is not anticipated to create significant increases in soil loss within the PV module arrays. Results of soil loss calculations are presented in Table 4.4-1 below.

Table 4.4-1
Estimated Soil Loss Rates Under Approved and Modified Project Conditions

Soil Type	Existing (ton/ac/yr)	Construction – Cut Area with No BMPs (ton/ac/yr)	Construction – Fill area with No BMPs (ton/ac/yr)	Construction – Average with No BMPs (ton/ac/yr)	Construction with BMPs (ton/ac/yr)	Operations with BMPs (ton/ac/yr)
Approved Project Estimates						
Carrizo Rositas Gunsight (60% Gravel, 30% Sand, 10% fines)	0.53	0.53	1.4	0.97	0.33	0.23
Nickel-Arizo-Bitter (30% Gravel, 30% Sand, 40% fines)	2.1	2.1	5.7	3.1	0.052	0.052
Modified Project Estimates						
Carrizo Rositas Gunsight (60% Gravel, 30% Sand, 10% fines)	0.53	0.06-0.53	0.13-1.4	0.97	0.0018-0.33	0.0018-0.23
Nickel-Arizo-Bitter (30% Gravel, 30% Sand, 40% fines)	2.1	0.24-2.1	0.56-5.7	3.1	0.014-0.052	0.014-0.052

Acronyms/Abbreviations/Notes:
BMP = Best Management Practice (silt fence, fiber roll, or other linear sediment control feature)
< = less than
% = percent
ton/ac/yr = tons per acre per year
Soil loss rates reflect sheet flow and rill erosion caused by storm water runoff and were calculated using the RUSLE2 computer program.

4.4.3 Changes in Cumulative Effects

Incremental impacts of the Modified Project on soils are expected to be the same or slightly reduced compared to the Approved Project. As described in Section 4.23, Cumulative Scenario, no new reasonably foreseeable future actions beyond those assumed in the Commission Decision have been identified. Therefore, no increase in cumulative impacts under the Modified Project is anticipated.

4.4.4 Changes in LORS Conformance and Other Permits

In the Commission Decision, the Commission concluded that, with the implementation of the Conditions, the Approved Project would comply with all applicable LORS. As with the Approved Project, the

Modified Project would comply with all applicable LORS, and no new or additional LORS have been identified.

The Commission Decision stated that the following permits relating to soils would be required prior to construction:

- a grading permit from the County of San Bernardino Land Use Services Department, Building & Safety Division;
- a Notice of Intent and National Pollutant Discharge Elimination System (NPDES) General Construction Storm Water Permit (Construction SWPPP); and
- a Notice of Intent and NPDES General Industrial Storm Water Permit (Industrial SWPPP).

The permits would be obtained prior to pre-construction site mobilization. The Modified Project would not be anticipated to necessitate any permits beyond those identified in the Commission Decision. In addition to the above permits, site-specific hydrologic/hydraulic/scour analyses and a DESCP would be prepared for submittal to San Bernardino County, BNSF and the Compliance Project Manager (CPM).

4.4.5 Changes in Proposed Mitigation

No new or more severe impacts requiring additional mitigation would result from the Modified Project. The mitigation measures proposed in the Commission Decision would mitigate impacts associated with the Modified Project to levels that would be less than significant.

4.4.6 Changes in Conditions of Certification

The Commission Decision listed Conditions SOIL&WATER-1 and SOIL&WATER-10, which are directly applicable to soils. No additional conditions would be necessitated under the Modified Project. Proposed changes to the Soil & Water Conditions are presented in Section 4.5, Water Resources.

4.4.7 References Cited

No references other than those presented in the Approved Project's record were used in the preparation of this analysis.

4.5 WATER RESOURCES

The following paragraphs describe the characteristics of the Modified Project that could affect water resources in a different manner than the Approved Project.

4.5.1 Summary of Project Changes Related to Water Resources

Characteristics of the Modified Project that have the potential to impact water resources differently than the Approved Project include the following:

- replacement of a majority of the SunCatchers with PV modules (coverage, orientation, location, spacing and size of posts);
- addition of inverter pads;
- grading configuration and disturbance;
- number and types of access roads; and
- relocation of the main services complex and on-site substation south of the railroad.

4.5.2 Changes in Environmental Impacts

The Commission Decision concluded that, with the implementation of the Conditions, the Approved Project would comply with all applicable LORS, and would not result in any unmitigated and significant direct, indirect or cumulative adverse impacts related to water resources.

The water resource topics addressed in the Commission Decision are: 1) storm water impacts related to flooding/drainage, erosion and sedimentation; 2) water supply and use, including maintenance of groundwater supplies; and 3) groundwater quality. (Commission Decision, Soil and Water Resources pp. 33-35.) As described below, with implementation of the Conditions, the Modified Project would not be anticipated to increase water resources impacts compared to the Approved Project.

4.5.2.1 Storm Water: Flooding, Erosion and Sedimentation

Hydrology, hydraulic, and sediment transport/scour analyses will be prepared to reflect effects of the movement of stormwater under the Modified Project. These reports will quantify the hydrologic, hydraulic, and sediment transport/scour conditions for existing (without Project) and proposed (Modified Project) conditions, and will assess any need for debris/sediment basins. These reports will also quantify the effects of the Modified Project on hydrology, hydraulics, and erosion/sedimentation on-site and at the railroad and BNSF ROW, and draft versions of the reports will be submitted to the CPM and BNSF for review and comment.

The following evaluation is based on currently available grading plans, site plans, and the Modified Project description. This evaluation may be updated based on a review of the results of the hydrology, hydraulics, and sediment transport/scour studies for the Modified Project. However, the changes are not

expected to be substantial, because the amount of overall project disturbance area, impervious surface area, and cut and fill ranges would not differ substantially from those analyzed for the Approved Project.

4.5.2.1.1 Disturbed Area

The extent of disturbed surface area is relevant to water resources because soil disturbance tends to increase infiltration of stormwater into the soil. Increases in paved and other impermeable surfaces tend to reduce storm water infiltration. In addition, ground disturbance that alters site topography through cut and fill may alter the flow across the site of storm water that does not infiltrate into the soil. Table 4.5-1 provides an estimate of the acreages that would likely be disturbed under the Modified Project.

Table 4.5-1
Approximate Disturbance Acreages

Disturbance South of BNSF Railroad	Modified Project (Acres)	Amount of Cut (Cubic Yards)	Amount of Fill (Cubic Yards)
Total Site Area	2,140	--	--
Unimproved Module Access Points	476.1	10,000	10,000
Access Road	104.3	20,000	12,500
Main Site Access Road	42.2	7,500	126,000
Main Service Complex	20.0	15,000	7,500
Laydown Service Area	30.0	35,000	25,000
PV Modules	475.5	350,000	331,450
Inverters	3.6	1,200	750
Substation	15.5	25,000	20,000
Total Disturbed Area South of BNSF Railroad	1,167	463,700	533,200
Disturbance North of BNSF Railroad			
Total Site Area	2,473	--	--
Unimproved Module Access Points	516.9	0	0
SunCatcher Maintenance Road	28.4	5,000	2,000
Access Road	87.5	20,000	12,000
Main Site Access Road	37.8	7,500	54,000
SunCatchers	454.4	50,000	10,000
Modules	516.3	190,000	125,000
Inverters	3.8	1,500	1,500
Total Disturbed Area North of BNSF Railroad	1,645	274,000	204,500
Totals			
Proposed Total Cut and Fill	--	737,700	737,700
Total Site Area South and North	4,613	--	--

Table 4.5-1
Approximate Disturbance Acreages
(Continued)

Disturbance South of BNSF Railroad	Modified Project (Acres)	Amount of Cut (Cubic Yards)	Amount of Fill (Cubic Yards)
Total Disturbed Area South and North	2812	--	--
Percentage of Total Site Area Disturbed	61%	--	--

Acronyms:
BNSF – Burlington Northern and Santa Fe Railroad
PV – photovoltaic
-- = not applicable

Under the Modified Project, the main site access road is the only road that would be paved. The SunCatcher maintenance roads and the access roads would be stabilized with a non-toxic soil stabilizer or soil weighting material. Unimproved module access points (no soil stabilizer applied) would be designated between every other row of PV modules; this is designed to reduce the number of access points for PV module washing and to reduce the amount of increased impervious areas on the site.

Impervious areas other than the main site access road would include roofs and pavement at the main services complex (approximately 20 acres), the roofs of the assembly buildings (approximately 17 acres), the inverter pads, and the on-site substation.

With the exception of bridge construction, maximum fill heights for the Modified Project are anticipated to be 10 feet. Fill heights up to 45 feet are anticipated for approaches to the bridge crossing over the railroad ROW. The anticipated average cut depth is approximately 6 feet. Although changes in cut and fill amounts are anticipated and locations of cut and fill would change across the Project site due to the installation of PV modules, the proposed cut and fill heights are not anticipated to create additional need for cut and fill compared to the Approved Project. Most of the earth movement would occur in Phase 1 (south of the railroad) to accommodate the change in technology to PV modules. The Modified Project would maintain a grading cut and fill balance equivalent to or less than that indicated in the December 15, 2010 DESCP. Currently, it is anticipated that up to 737,000 cubic yards of earth would be moved during construction of the Modified Project. The December 15, 2010 DESCP indicated that up to 747,000 cubic yards of earth would be moved during construction of the Approved Project.

There is the potential that the hydrologic, hydraulic, and sediment response for the Modified Project may change from that of the Approved Project as a result of the PV module spacing, coverage, post size, and PV module orientation. The total area occupied by PV module posts is estimated to be approximately 77,586 square feet (1.8 acres) versus the approximate 83,468 square feet (1.9 acres) of SunCatcher pedestals under the Approved Project. This results in an approximate 7 percent reduction in site surface area occupied by the Modified Project arrangement PV module posts and SunCatcher pedestals. Thus, the total surface area for the Modified Project site permanently disturbed by PV module posts and SunCatcher pedestals would be less than with the Approved Project, although the greater number of smaller posts could affect storm water flow patterns.

Like the Approved Project main services complex, north of the railroad, the Modified Project main services complex, south of the railroad, may need protection from flooding in the form of a storm water retention area. As required by the Conditions, the hydrology analysis will determine which BMPs are required to meet performance standards identified in the Commission Decision.

It is anticipated that the relocation of the main services complex and the substation to south of the railroad would not increase runoff, soil erosion, or sedimentation impacts because the size and impermeable area of the main services complex would not increase under the Modified Project.

With implementation of the Conditions, including the requirement to prepare, and implement the recommendations of, the hydrology, hydraulic, and sediment transport/scour analyses, the Modified Project would not increase flooding, erosion, or sedimentation impacts compared to the Approved Project.

4.5.2.2 Water Supply and Use

The Modified Project would use the same water well as the Approved Project. Water would be piped to the new location of the main services complex south of the railroad. An updated water mass balance diagram is provided in Appendix D.

Construction water use would not exceed the average annual amount indicated in the Approved Project Soil&Water Condition 4 (145 acre-feet per year (afy)). Average annual water use during construction is currently expected to be approximately 120 afy over the anticipated four-year construction period.

Water use during operation of the Modified Project would not exceed the average annual amount indicated in the Approved Project Soil&Water Condition 4 (21 afy). Average annual water use during operation of the Modified Project would be approximately 20 afy. Water use during operation would include mirror and module washing (8.0 afy), water treatment (3.9 afy), potable use (1.7 afy), dust control (6.1 afy), and hydrogen generation (0.025 afy). PV module washing is expected to be performed twice per year. Table 4.5-2 provides estimates of the water usage rates during operation of the Modified Project.

Table 4.5-2
Operation Water Usage Rates for the Modified Project

Water Use	Daily Average (gallons per minute)	Daily Maximum (gallons per minute)	Annual Usage (acre feet)
Equipment Water Requirements			
SunCatcher Mirror Washing	1.6	5.7	2.2
PV Module Washing	4.2	14.9	5. 8
Water Treatment System Discharge			
Brine to Evaporation Ponds	2.3	12.8	3.9
Potable Water Use			
For Drinking and Sanitary Water Requirements	2.0	4.4	1.7

Table 4.5-2
Operation Water Usage Rates for the Modified Project
(Continued)

Water Use	Daily Average (gallons per minute)	Daily Maximum (gallons per minute)	Annual Usage (acre feet)
Dust Control			
Well Water for Dust Control During Operations	4.5	15.8	6.1
Hydrogen Production Plant			
Water to Produce Hydrogen for SunCatchers	0.02	0.06	0.025
Totals	14.62	53.6	19.725

Acronym:
PV – photovoltaic

The Commission Decision indicated that the impact of the Approved Project on groundwater levels would be less than significant. Because average annual construction and operation water uses would be less than or equal to the permitted amounts with the Modified Project, the impacts to groundwater would still be considered less than significant.

4.5.2.3 Wastewater

The following paragraphs discuss impacts associated with the Modified Project on sanitary wastewater, construction wastewater, and process wastewater systems.

4.5.2.3.1 Sanitary Wastewater

No increase in impacts resulting from the Modified Project has been identified in relation to sanitary wastewater. The Modified Project would require fewer workers during construction and operation than would the Approved Project, so lower demands would be imposed on sanitary systems. The Modified Project, like the Approved Project, would utilize temporary portable toilets during construction prior to the installation of a septic tank and leach field. As with the Approved Project, the septic tank and leach field would be designed to meet the requirements of the RWQCB and the San Bernardino County Public Health Department, and would meet operation and maintenance guidelines required by the California Department of Public Health. To ensure that no hydrocarbons enter the leach field, the sinks and showers in the maintenance facility would be plumbed to the wastewater recycling system that would treat the equipment washdown water.

4.5.2.3.2 Construction Wastewater

Wastewater generated during construction would consist of equipment washwater and piping and vessel hydrostatic test water. Construction impacts under the Modified Project could result from uncontrolled releases of non-stormwater discharges. However, potential construction-phase non-stormwater discharges would be mitigated through the implementation of BMPs identified in a construction-phase SWPPP. No

additional impacts resulting from the Modified Project, related to construction wastewater, have been identified. Sources and amounts of wastewater generated during construction (equipment wash water and piping and vessel hydrostatic test water) would remain the same as under the Approved Project.

4.5.2.3.3 Process Wastewater

Potential impacts associated with the process wastewater for the Approved Project include RO wastewater discharge to lined evaporation ponds. With the implementation of the BMPs and design parameters identified in a Report of Waste Discharge (ROWD) (and subsequent Waste Discharge Requirements), no significant water quality impacts are anticipated. No additional impacts resulting from the Modified Project in relation to process wastewater have been identified. Similar to the process wastewater description in the Commission Decision, extracted groundwater for the Modified Project would undergo RO treatment to remove dissolved solids for washwater applications and additional treatment would be utilized to meet current drinking water quality standards. Well water contains approximately 1,340 milligrams per liter (mg/L) of TDS. As with the Approved Project, after the RO process, wastewater from the Modified Project would contain approximately 5,000 to 7,000 mg/L of TDS. The Approved Project included provision for process wastewater discharge to two double-lined evaporation ponds (located in the main services complex), each designed to contain one year of discharge flow, previously estimated to be approximately 3 million gallons. The estimated wastewater effluent for the Modified Project would be the same as or less than that previously approved, so it is not anticipated that additional design requirements beyond those identified in the Commission Decision would be required for process wastewater treatment and disposal. As required in the Commission Decision, the design, construction, and operation of the evaporation ponds would be in accordance with RWQCB requirements, a ROWD would be filed with the RWQCB, and waste discharge requirements would be obtained for operation of the evaporation ponds.

4.5.3 Changes in Cumulative Environmental Impacts

The Commission Decision concluded that the Approved Project would not result in any significant cumulative impacts to water resources. Incremental impacts of the Modified Project on water resources are expected to be the same or slightly reduced compared to the Approved Project. As described in Section 4.23, Cumulative Scenario, no new reasonably foreseeable future actions beyond those assumed in the Commission Decision have been identified. Therefore, no increase in cumulative impacts under the Modified Project is anticipated.

4.5.4 Changes in LORS Conformance and Other Permits

In the Commission Decision, the Commission concluded that, with the implementation of the Conditions, the Approved Project would comply with all applicable LORS. The Commission identified the LORS listed below associated with water resources.

The Commission Decision identified the following potential regulatory permits required for the Approved Project:

- Construction Stormwater Pollution Prevention Plan (RWQCB and State Water Resources Control Board (SWRCB));
- Industrial Stormwater Pollution Prevention Plan (RWQCB and SWRCB);
- ROWD/Waste Discharge Requirements (RWQCB);
- Streamed Alteration Agreement (California Department of Fish and Game (CDFG));
- Section 404 Permit (United States Army Corps of Engineers); and
- Section 401 Water Quality Certification (RWQCB).

Note that no Waters of the United States exist on the Approved and Modified Project site and, therefore, federal wetland permitting is not required under Section 404, and a 401 Water Quality Certification is not required either for the Approved Project or the Modified Project.

A draft construction SWPPP was prepared for the Approved Project and was last submitted to the SWRCB on November 15, 2010. The construction SWPPP required that a revision to the SWPPP, to include the Modified Project, be provided. The modified SWPPP would be submitted and distributed in accordance with SOIL&WATER Condition-10. A draft industrial SWPPP has not yet been prepared. An industrial SWPPP would be prepared and distributed in accordance with SOIL&WATER Condition-11. A draft ROWD was submitted to the RWQCB on June 30, 2010. The draft ROWD requires revision to incorporate the Modified Project and resubmittal and approval through the RWQCB and distribution per SOIL&WATER Condition-2.

There have been no identified regulatory changes since issuance of the Commission Decision that would necessitate additional permits. The Modified Project is not anticipated to necessitate any permits beyond those listed in the Commission Decision.

4.5.5 Changes in Proposed Mitigation

No new or more severe impacts requiring additional mitigation are anticipated to result from the Modified Project. The anticipated impacts associated with the Modified Project identified in this section will be confirmed after review of the hydrology, hydraulic, and sediment transport/scour analyses for the Modified Project. If revisions to any mitigation measures are recommended in these analyses, they will be submitted for consideration at that time.

4.5.6 Changes in Conditions of Certification

The conforming changes to the Conditions for the Modified Project related to soil and water resources are:

DRAINAGE EROSION AND SEDIMENTATION CONTROL PLAN

SOIL&WATER-1 Prior to Pre-Construction Site Mobilization, the project owner shall submit for BNSF's review~~,~~ and comment ~~as to those portions of deliverables relating to the study and requirements of **SOIL&WATER-12**,~~and to the CPM for review and approval**,** a site specific Drainage, Erosion and Sediment Control Plan (DESCP) that ensures protection of: 1) water quality and soil resources of the project site; 2) all linear features on the project site, including but not limited to maintenance, access and perimeter roads, SunCatchers, power feed lines, and hydrogen lines; 3) all other structures on the project site; and 4) adjacent properties, including the BNSF right of way, for both the construction and operational phases of the project. ~~Subsequent to delivery of the DESCP to BNSF, the project owner shall deliver the DESCP to the CPM for its review and approval.~~ This plan shall address appropriate methods and actions, both temporary and permanent, on the project site, for the protection of water quality and soil resources, and for the protection of adjacent properties, including the BNSF right of way. The plan shall demonstrate no increase in off-site flooding potential, and no increase in storm water runoff or sediment transport off the project site and onto the BNSF right of way. The plan shall protect the BNSF right of way from storm water runoff and sediment transport in excess of existing conditions. The plan shall identify all monitoring and maintenance activities. The project owner shall complete all necessary engineering plans, reports, and documents necessary for BNSF and the CPM to conduct a review of the proposed project and for the project owner to provide a written evaluation as to whether the proposed grading, drainage improvements, and flood management activities will comply with all requirements presented herein.

The plan shall be developed based upon:

the Initial Drainage Report prepared for the applicant by Stantec Consulting dated October 2008;

the Drainage Erosion and Sediment Control Plan prepared for the applicant by Huitt Zollars dated August 25, 2009;

the Existing Conditions Hydrologic and Hydraulics Study prepared for the applicant by Huitt Zollars dated April 23, 2009 and the alternative mitigation recommendations contained therein; and

the Infiltration Report required by Condition of Certification **SOIL&WATER-1 3.**

The plan shall comply at a minimum, with the following:

1) the San Bernardino County Hydrology Manual and 2007 Development Code (amended, March 25, 2010); the regulations of the County of San Bernardino Department of Public Works (CSBDPW);

all State SWPPP requirements;

3) FEMA Guidelines for Determining Flood Hazards on Alluvial Fans and Guidelines and Specifications for Flood Hazard Mapping Partners, Appendix G, Guidance for Alluvial Fan Flooding Analyses and Mapping. Specifically, pursuant to the FEMA-administered National Flood Insurance Program adopted by San Bernardino County, the project design shall be based on the assumption that the primary flow from the apex of the alluvial fan may flow to any single location within the site. 44 C.F.R. 65.13.

The DESCP shall contain the following elements:

Vicinity Map: A map shall be provided indicating the location of all project elements with depictions of all major geographic features both on the project site and upstream and downstream from the project site, to include watercourses, ephemeral washes, irrigation and drainage canals, major utilities, and sensitive areas.

Site Delineation: The site and all project elements shall be delineated showing boundary lines of all construction areas and the location of all existing and proposed structures, underground utilities, roads, drainage facilities and easements. Adjacent property owners shall be identified on the plan maps. All maps shall be prepared at a scale of 1" – 50'. The site delineation shall be based on the State Plane Coordinates System.

3) Drainage: The DESCP shall include the following analyses, in order to verify compliance with the minimum performance standards set forth in **SOIL&WATER-8** (1)(a-p):

Topography. Topography for offsite areas is required to define the existing upstream tributary areas to the site and downstream to provide enough definition to map the existing storm water flow and flood hazard. Spot elevations shall be required where relatively flat conditions exist.

Proposed Grade. Proposed grade contours shall be shown at a scale of 1" – 50' with current mapping to 1' contour interval accuracy in order to accurately delineate onsite ephemeral washes, drainage ditches, and tie-ins to the existing topography. Hydrology. Existing and proposed hydrologic calculations for onsite areas and offsite areas that drain to and from the site; include maps showing the drainage area boundaries and sizes in acres, topography and typical overland flow directions, show all existing, interim, and proposed drainage infrastructure and their resulting direction of flow, and depict where any proposed drainage is intended to alter the direction, velocity or volume of existing flow.

Hydraulics. Provide hydraulic calculations to support the selection and sizing of the onsite drainage network, diversion facilities and Best Management Practices (BMPs) preventing impacts to project features and the BNSF right of way.

e. Sedimentation. Calculations of existing sediment transport conditions, and an analysis of sediment transport across and off the project site shall be provided.

Watercourses and Critical Areas: The DESCP shall show the location of all onsite and nearby watercourses including ephemeral washes, irrigation and drainage canals, and drainage

ditches, and shall indicate the proximity of those features to the project site and both sides of the BNSF right of way and other adjacent properties.

Clearing and Grading: The plan shall provide a delineation of all areas to be cleared of vegetation, areas to be preserved, and areas where vegetation would be cut to allow clear movement of the SunCatchers. The plan shall require that clearing be kept to a minimum, and shall provide for the planting of approved erosion control vegetation. The plan shall provide elevations, slopes, locations, and extent of all proposed grading as shown by contours, cross-sections, cut/fill depths or other means. The locations of any disposal areas, fills, or other special features shall also be shown. Existing and proposed topography tying in proposed contours with existing topography shall be illustrated. The DESCP shall include a statement of the quantities of material excavated at the site, whether such excavations or fill is temporary or permanent, and the amount of such material to be imported or exported or a statement explaining that there would be no clearing and/or grading conducted for each element of the project. Areas of no disturbance shall be properly identified and delineated on the plan maps.

6) Soil, Wind, and Water Erosion Control: The plan shall address exposed soil treatments to be used during construction and operation of the proposed project for both road and non-road surfaces including the specific identification of all chemical-based dust palliatives, soil bonding, and weighting agents appropriate for use at the proposed project site that would not cause adverse effects to vegetation. BMPs shall include measures designed to prevent wind and water erosion including application of chemical dust palliatives after rough grading to limit water use. The plan shall identify and quantify the area of all surfaces where chemical dust palliatives, soil binders and weighting agents shall be used. The plan shall demonstrate, through these or other control measures, the prevention of changes in the direction, volume or velocity of storm water runoff off the site. The location and use of all dust palliatives, soil binders, and weighting agents shall be approved by the CPM prior to use. The plan shall provide for the regular maintenance of any debris and detention basins or other structural controls. The plan shall also demonstrate on-site roadways and other infrastructure are designed and located to avoid altering existing and proposed flow paths.

Project Schedule: The DESCP shall identify on the topographic site map the location of the site-specific BMPs to be employed during each phase of construction (initial grading, project element construction, and final grading/stabilization) and during operation. Separate BMP implementation schedules shall be provided for each project element for each phase of construction and operation~~. This scheduling should require the installation of debris basins, detention/ infiltration basins, swales, and related storm water management facilities before construction commences on each phase. Existing Conditions Hydrologic and Hydraulics Study prepared for the applicant by Huitt Zollars dated April 23, 2009 and the alternative mitigation recommendations contained therein~~;

Best Management Practices: The DESCP shall include BMPs which would prevent project-related adverse impacts to project features or the BNSF right of way. The DESCP shall show the location, timing, and maintenance schedule of all erosion-and sediment-control BMPs to be used prior to initial grading, during project element excavation and construction, during final grading/stabilization, and after construction. BMPs shall

include measures designed to control dust and stabilize construction access roads and entrances. The maintenance schedule shall include post-construction maintenance of treatment-control BMPs applied to disturbed areas following construction, which areas may include artificial ~~gulleys~~gullies created along or around project features during weather events.

Erosion Control Drawings: The erosion-control drawings and narrative shall be designed, stamped and sealed by a professional engineer or erosion-control specialist.

Comments: The DESCP shall include copies of recommendations, conditions, and provisions from the BNSF, County of San Bernardino, California Department of Fish and Game (CDFG), and the Lahontan Regional Water Quality Control Board (LRWQCB) and FEMA.

11) Monitoring Plan: Monitoring activities shall include inspection of erosion and sedimentation control measures, routine measurement of the volume of accumulated sediment in the onsite drainage ditches, and storm water diversions and the requirements specified in Soil and Water Appendix B, C, and D. Monitoring activities shall be conducted prior to each forecasted storm event and following any storm event. A storm event is defined in the verification for this Condition, and any change in the definition shall be provided in advance to BNSF.

Verification: The DESCP shall be consistent with the grading and drainage plan as required by Condition of Certification **CIVIL-1,** and relevant portions of the DESCP shall clearly show approval by the chief building official (CBO). In addition, the project owner shall do all of the following:

No later than forty-five (45) days prior to the start of Pre-Construction Site Mobilization, the project owner shall submit a copy of the DESCP to ~~BNSF for review, and comments as to those portions of deliverables relating to the study and requirements of **SOIL&WATER-12.** Fifteen (15) days after delivery of the DESCP to BNSF, the project owner shall deliver the DESCP to~~ the County of San Bernardino, the LRWQCB, California Department of Fish and Game, FEMA Region IX, BNSF and the CPM for review and comment. The CPM shall consider comments from BNSF received within 15 days of submittal by project owner, in approving the plan.

During construction, the project owner shall provide BNSF and the CPM an analysis in the monthly compliance report on the effectiveness of the drainage-, erosion- and sediment-control measures and the results of monitoring and maintenance activities.

c) Once operational, the project owner shall provide BNSF and the CPM information on the results of storm water BMP monitoring and maintenance activities after each storm event and in the annual compliance report. A storm event is defined as rainfall of 10mm or more in a 24-hour period, as measured at or within 1 mile of the Project site.

d) The project owner shall provide BNSF and the CPM with two copies each of all monitoring or other reports required for compliance with San Bernardino County Department of Public Works Flood Control District, CDFG, LRWQCB, and FEMA.

WASTE DISCHARGE REQUIREMENTS

SOIL&WATER-2 The project owner shall comply with the Waste Discharge Requirements presented in the SSA Appendices B, C, D, and E for Soil and Water Resources (Ex. 300, C.7-89-C.7-132) and hereby incorporated by reference, for the design, construction and operation of the surface impoundments (evaporation ponds) and storm water management system. These requirements relate to discharges, or potential discharges, of waste that could affect the quality of waters of the state, and were developed in consultation with staff of the State Water Resources Control Board and/or the applicable California Regional Water Quality Control Board (hereafter "Water Boards"). It is the Commission's intent that these requirements be enforceable by both the Commission and the Water Boards. In furtherance of that objective, the Commission hereby delegates the enforcement of these requirements, and associated monitoring, inspection and annual fee collection authority, to the Water Boards.

Accordingly, the Commission and the Water Board shall confer with each other and coordinate, as needed, in the enforcement of the requirements. The project owner shall pay the annual waste discharge permit fee associated with this facility to the Water Boards. In addition, the Water Boards may "prescribe" these requirements as waste discharge requirements pursuant to Water Code Section 13263 solely for the purposes of enforcement, monitoring, inspection, and the assessment of annual fees, consistent with Public Resources Code Section 25531, subdivision (c).

Verification: No later than sixty (60) days prior to any wastewater or storm water discharge, the project owner shall provide documentation to BNSF and the CPM, with copies to the LRWQCB, demonstrating compliance with the WDRs established in Appendices B, C, D and E. Any changes to the design, construction, or operation of the evaporation ponds or storm water management system shall be requested in writing to the CPM, with copies to BNSF and the LRWQCB, and approved by the CPM, in consultation with the LRWQCB, prior to initiation of any changes. The CPM shall consider comments received within thirty (30) days from BNSF and LRWQCB, in approving the plan. The project owner shall provide to the CPM, with copies to the LRWQCB and BNSF, all monitoring reports required by the WDRs, and fully explain any violations, exceedances, enforcement actions, or corrective actions related to construction or operation of the ponds or storm water system.

STORM WATER DAMAGE MONITORING AND RESPONSE PLAN

SOIL&WATER-3 The project owner shall ensure that all SunCatcher pole foundations are designed to withstand storm water scour from surface erosion and/or channel migration based on a Scour Analysis and Pole Foundation Stability Report to be completed by a Professional Engineer and Professional Geologist. The Pole Foundation Stability Report shall establish a Minimum Depth Stability Threshold. In developing the Pole Foundation Stability Report, the engineer shall use models

approved by FEMA, and shall comply with all applicable FEMA regulations and standards. The Scour Analysis shall consider the unstable nature of high-energy, debris laden stream flows based on supercritical flow depths and velocities and using the correct Equation 6.1 from the Federal Highway Administration's Hydraulic Engineering Circular 18, which has factors of K1, K2, K3, and K4. The additional factors account for the unstable nature of flood flows in steep, alluvial washes during moderate to large flood events. The project owner shall also develop a Storm Water Damage Monitoring and Response Plan to evaluate potential impacts from storm water, including pole foundations that fail due to storm water flow or otherwise break and scatter mirror debris and other SunCatcher components on to the ground surface. The Storm Water Damage Monitoring and Response Plan shall include the following elements:

Detailed maps showing the installed location of all SunCatcher pole foundations within each project phase, including existing and proposed drainage channels.

Each SunCatcher pole foundation should be identified by a unique ID number marked to show initial ground surface at its base, and the depth to the tip of the pole below ground.

3. Minimum Depth Stability Threshold to be maintained of SunCatcher pole foundations to meet long-term stability for applicable wind, water and debris loading effects, as determined by the Scour Analysis and the Pole Foundation Stability Report.

The depth of scour associated with each SunCatcher support, and the natural erosion associated with lateral migration of channels.

Above and below ground construction details of a typical installed SunCatcher pole foundation.

BMPs to be employed to prevent the potential impact of broken mirrors to soil resources.

Methods and response time of mirror cleanup and measures that may be used to mitigate further impact to soil resources from broken mirror fragments.

A demonstration that the project design will withstand erosional forces which could impact site operations, and that would not result in transportation of damaged materials outside the site boundary.

A protocol for monitoring and responding to storm events, which shall require communication of response activities to BNSF and the CPM, and coordination with BNSF and the CPM for response activities where applicable.

Monitor and Inspect Site Before First Seasonal and After Every Storm Event:

Security and Tortoise Exclusion Fence: Inspect for damage and buildup of sediment or debris.

SunCatcher Pole Foundations within Drainages or Subject to Drainage Overflow: Inspect for tilting, mirror damage, depth of scour compared to foundation depth below ground and the Minimum Depth Stability Threshold, collapse, and downstream transport.

Drainage Channels: Inspect for substantial migration or changes in depth, and transport of broken mirror glass.

Constructed Diversion Channels: Inspect for scour and structural integrity issues caused by erosion, and for sediment and debris buildup.

Documentation: A detailed summary of the periodic inspections and any necessary maintenance and repairs shall be provided to BNSF and the CEC after each inspection.

Short-Term Incident-Based Response:

Security and Tortoise Exclusion Fence: repair damage, and remove build-up of sediment and debris.

SunCatcher Pole Foundations: Remove broken glass, damaged structures, and wiring from the ground, and for foundations no longer meeting the Minimum Depth Stability Threshold, either replace/reinforce or remove the SunCatcher to avoid exposure for broken glass. Drainage Channels: no short-term response necessary unless changes indicate risk to facility structures.

Constructed Diversion Channels: repair damage, maintain erosion control measures and remove built-up sediment and debris.

Long-Term Design-Based Response:

Propose operation/BMP modifications to address ongoing issues. Include proposed changes to monitoring and response procedures, frequency, or standards.

Replace/reinforce SunCatcher Pole Foundations no longer meeting the Minimum Depth Stability Threshold or remove the SunCatchers to avoid exposure for broken glass.

Propose on-site design modifications to address ongoing issues. This may include construction of active on-site storm water management diversion channels, debris basins and/or detention ponds.

Inspection, short-term incident response, and long-term design-based response may include activities both inside and outside of the approved right-of-way on BLM land. For activities outside of the approved right-of-way, the ~~Applicant~~Project owner will notify BLM and acquire environmental review and approval before field activities begin.

Verification: At least thirty (30) days prior to ~~construction~~the start of Pre-Construction Site Mobilization, the project owner shall submit a copy of the Scour Analysis and Pole Foundation Stability Report and the Storm and the Storm Water Damage Monitoring and Response Plan to BNSF for review and comment and to the CPM for review and approval.

The CPM shall consider comments received ~~within fifteen (15) days, in approving the Scour Analysis and Pole Foundation Stability Report and the Storm Water Damage Monitoring and Response Plan.~~from BNSF in approving the basis of design report required by **SOIL&WATER-8.** The project owner shall retain a copy of these documents onsite at the power plant at all times. The project owner shall prepare an annual summary of the number of pole ~~foundations failed~~foundationsfailed, cause of the failures, and cleanup and mitigation performed for each failed pole foundation~~.~~

CONSTRUCTION AND OPERATIONS WATER USE

SOIL&WATER-4 The proposed project's use of groundwater for all construction activities shall not exceed 145 AFY. The proposed project's use of groundwater for all operational activities shall not exceed 21 AFY. Use of ground or other water sources in excess of these limits are prohibited unless the project owner seeks a Project Amendment.

Prior to the use of groundwater for construction, the project owner shall install and maintain metering devices as part of the water- supply and distribution system to document project water use and to monitor and record in gallons per day the total volume(s) of water supplied to the project from the water source. Documentation of the installation and operation of the metering devices shall be submitted to the Commission prior to use of any groundwater for project activities. The metering devices shall be operational for the life of the project. An annual summary of daily water use by the project shall be submitted to the CPM in the annual compliance report.

Verification: At least thirty (30) days prior to the start of construction of the proposed project, the project owner shall submit to the CPM a copy of evidence that metering devices have been installed and are operational.

Beginning six (6) months after the start of construction, the project owner shall prepare a semi-annual summary of amount of water used for construction purposes. The summary shall include the monthly range (daily minimum and daily maximum) and monthly average of daily water usage in gallons per day.

The project owner shall prepare an annual summary, which will include daily usage, monthly range and monthly average of daily water usage in gallons per day, and total water used on a monthly and annual basis in AF. For years subsequent to the initial year of operation, the annual summary will also include the yearly range and yearly average water use by source. For calculating the total water use, the term "year" will correspond to the date established for the annual compliance report submittal.

SEPTIC SYSTEM AND LEACH FIELD REQUIREMENTS

SOIL&WATER-5 ~~Prior to the start of construction of Phase 1b, the~~The project owner shall provide the design of a sanitary waste septic system that complies with the County of San Bernardino requirements for the construction and operation of the

project's proposed sanitary waste septic system and leach field to the CPM for review and approval.

Project operation shall not commence until documentation equivalent to the County's required wastewater treatment system permits are issued by the County and approved by the CPM.

The project owner shall remain in compliance with the County requirements for the life of the project.

Verification: ~~The~~Prior to the start of construction of the main services complex, the Project owner shall submit all necessary information and the appropriate fee to the County of San Bernardino to ensure that the project has complied with the county's sanitary waste disposal facilities requirements. A written assessment prepared by the County of San Bernardino confirming that the design of the project's sanitary waste septic system conforms with county requirements must be provided to the CPM for review and approval thirty (30) days prior to the start of ~~site~~ construction of the waste facilities.

A written assessment prepared by the County of San Bernardino of the project's compliance with county's sanitary waste disposal facilities requirements must be provided to the CPM for review and approval sixty (60) days prior to the start of power plant operation.

DECOMMISSIONING PLAN

SOIL&WATER-6

The Project owner shall identify likely decommissioning scenarios and develop specific decommissioning plans for each scenario that will identify actions to be taken to avoid or mitigate long-term impacts related to or resulting from decommissioning project features, including but not limited to roadways and roadway treatments, structures and SunCatchers and PV modules, and water and wind erosion after decommissioning. Actions may include such measures as a decommissioning SWPPP, monitoring of revegetation and restoration of disturbed areas, post-decommissioning maintenance, collection and disposal of project materials and chemicals, and access restrictions.

Verification: At least thirty (30) days prior to Pre-Construction Site Mobilization, the project owner shall submit decommissioning plans to BNSF and the CPM for review and comment. The CPM shall consider comments received within fifteen (15) days, in approving the plan. The project owner shall amend these documents as necessary, with approval from the CPM, should the decommissioning scenario change in the future.

GROUNDWATER LEVEL MONITORING AND REPORTING PLAN

SOIL&WATER-7

The project owner shall submit a Groundwater Monitoring and Management Plan to BNSF and San Bernardino County for review and comment, and to the CPM for review and approval. The CPM's approval shall be in accordance with the County of San Bernardino Code Title 3, Division 3, Chapter 6, Article 5 (Desert Groundwater Management Ordinance).

The Groundwater Monitoring and Management Plan shall provide a detailed methodology for monitoring background and site groundwater levels. Monitoring shall be conducted prior to construction, during construction, and throughout project operation. The primary objective for the monitoring is to establish pre-construction and project related groundwater level trends that can be quantitatively compared against observed and simulated trends near the project pumping well and dedicated monitoring wells. Water level measurements in the project's water supply well shall represent non-pumped conditions, and be collected a minimum of four hours after pump shut-down.

Prior to project construction, monitoring shall commence to establish pre-construction base-line conditions and reporting shall include existing monitoring data collected in the project area useful for quantifying hydraulic gradients across the Pisgah Fault and between the Lavic Lake and Lower Mojave groundwater basins. The monitoring network shall therefore be designed to also incorporate and report relevant ongoing monitoring and reporting activities currently occurring in existing groundwater wells located within the Lavic Lake and Lower Mojave groundwater basins.

In areas where groundwater elevation data is needed but existing wells are absent or do not represent the water-bearing zone from which the project water supply well extracts groundwater, the monitoring network shall be comprised of wells screened to measure water levels representing the water-bearing zone from which the project water supply well will extract groundwater.

In addition, the project owner shall install 5 surveyed monument markers between the Railroad ROW and the water supply well, with one marker adjacent to the supply well. If the measured static groundwater level drops 5' or more, the project owner shall: (1) notify the CPM and BNSF of the drop and (2) prepare a Subsidence Mitigation Plan that will be reviewed and commented on by BNSF, and approved by the CPM.

Verification: The project owner shall complete the following:

a) At least two (2) months prior to ~~power plant construction~~Pre-Construction Site Mobilization, a Groundwater Monitoring and Management Plan shall be submitted to BNSF and the County of San Bernardino for review and comment, and to the CPM for review and approval before completion of Condition of Certification **SOIL&WATER-3.** ~~The CPM shall consider comments received within fifteen (15) days, in approving the Plan.~~ The plan shall include a scaled map showing the site and vicinity, existing well locations, and proposed monitoring locations (both existing wells and new monitoring

wells proposed for construction). The map shall also include relevant natural and man-made features (existing and proposed as part of this project). The plan also shall provide: (1) well construction information and borehole lithology for each existing well proposed for use as a monitoring well; (2) description of proposed drilling and well installation methods for new wells; (3) proposed monitoring well design; and, (4) schedule for completion of the work.

At least one (1) month prior to ~~construction~~Pre-Construction Site Mobilization, a Groundwater Level Network Report shall be submitted to BNSF and to the CPM. The report shall include a scaled map showing the final monitoring well network. It shall document the drilling methods employed, provide individual well construction as-~~builds~~builts, borehole lithology recorded from the drill cuttings, well development, and well survey results for all new wells. The well survey shall measure the location and elevation of the top of the well casing and reference point for all water level measurements, and shall include the coordinate system and datum for the survey measurements. Additionally, the report shall describe the water level monitoring equipment employed in the wells and document their deployment and use.

As part of the monitoring well network development, any newly constructed monitoring wells shall be permitted and constructed consistent with San Bernardino County and State specifications.

At least one (1) week prior to ~~project construction~~Pre-Construction Site Mobilization, all water level monitoring data shall be provided to BNSF and to the CPM. The data transmittal shall include an assessment of pre-project water level trends, a summary of available climatic information (monthly average temperature and rainfall records from the nearest weather station), and a comparison and assessment of water level data.

After project construction and during project operations, the project owner shall submit the monitoring data annually to BNSF and to the CPM. The summary shall document water level monitoring methods, the water level data, water level plots, and a comparison between pre- and post-project start-up water level trends. The report shall also include a summary of actual water use conditions, monthly climatic information (temperature and rainfall), and a comparison and assessment of water level data. As part of this assessment, the project owner shall calculate water level trends and complete a 5-year projection of future water levels based on these trends and an evaluation of water supply reliability.

STORMWATER CONTROL/FLOOD PROTECTION DESIGN PLANS

SOIL&WATER-8: Prior to Pre-Construction Site Mobilization, the project owner shall submit two copies of the basis of design report, and the subsequent 30-percent, 60-percent, and 90-percent design drawings for the grading, drainage, and storm water mitigation facilities to BNSF for review, and comment ~~as to those portions of the deliverables relating to the study and requirements of **SOIL&WATER-12.** Subsequent to submittal to BNSF, project owner shall submit two copies of the basis of design report, and the subsequent 30-percent, 60-percent, and 90-percent design drawings for the grading and drainage and storm water~~

~~mitigation facilities to BNSF and the CPM for review and comment~~and to the CPM for review and approval. The 30-percent, 60- percent, and 90-percent design drawings for the grading, drainage, and storm water mitigation facilities shall have been preceded by a basis of design report to convey and support the design approach. To prepare the grading, drainage and storm water mitigation facilities drawings and accompanying basis of design report, the project owner shall do the following:

1. At a minimum, the design report shall ensure the project meets the following performance standards:

Project construction and operation shall not alter either the existing watershed or sub-watershed boundaries, as depicted in the Scour/Flood Risk Map: Existing Conditions, Appendix A, page 2, Existing Condition Hydrologic and Hydraulic Study for Solar One (Phase 1 and 2) Project Site, prepared for the applicant by Huitt-Zollars dated April 3, 2009, that flow to the various structures within the BNSF right of way.

Project construction and operation shall not adversely affect any railroad structure, series of structures or embankments through changes in the concentration, volume or velocity of storm water runoff, or the volume of sediment reaching the railroad right of way and all structures within it, and shall not result in increased concentrations of storm water runoff or sediment that could affect the integrity and safety of the BNSF right of way or its operations. Specifically, project owner's on-site drainage improvements shall be designed and constructed to ensure that the BNSF right of way is protected from sediment transport and peak storm water flows resulting from a 100-year, 6-hour flood event. ~~Any~~If required, any of project owner's on-site detention or debris basins shall be designed and constructed to ensure the BNSF right of way is ~~protected from sediment transport and peak storm water flows~~not impacted by flows in excess of existing conditions resulting from a 100-year, 24-hour flood event. In performing this analysis a FEMA approved model for alluvial fans shall be utilized.

Subject to subparagraph b above, post-development runoff from the project site shall be equal to or less than predevelopment runoff.

Post development sediment transport through the project site shall be equal to predevelopment sediment transport.

The project shall not increase erosion of the desert soils or divert storm water from its current path~~, including~~ at site boundaries.

~~f.~~ The project owner's installation grid of SunCatchers and PV modules shall not result in diverting storm water across existing watershed or sub-watershed boundaries.

~~g.~~ All on-site maintenance and access roads shall be constructed and aligned with existing storm water conveyance channels to ensure the maintenance of current channelization of storm water runoff patterns.

~~h.~~ Once it is determined where SunCatchers can be located, the burial depth and foundation characteristics shall be based on the Pole Foundation Stability Report and Scour Analysis.

~~i.~~ No ~~SunCatchershall~~SunCatcher or PV modules shall be placed in an area where, in light of the applicable engineering standards to be used in installing the SunCatchers and PV modules, the hydrologic study~~ required pursuant to **SOIL&WATER-12**~~ indicates the integrity of the installation could be undermined, using the FEMA standards which require the hydrologic analysis to assume that the primary flow from the apex of the alluvial fan flows to said SunCatcher or PV modules.

~~j.~~ No SunCatcher shall be placed in an area where the computed storm water flows using ~~the~~a hydrologic study ~~required pursuant to **SOIL&WATER-12** from~~for a 100-year, 24-hour storm and following appropriate FEMA guidelines and standards for the distribution of these flows, could result in more scour than is recommended in the Scour Analysis and Pole Foundation Stability Report, using the correct and current local scour equation from the Federal Highway Administration's Hydraulic Engineering Circular 18 (HEC-18), which includes velocity, the characteristics of the natural sediment, and the possibility of unstable wave formations during moderate to large floods.

~~k.~~ All detention and debris basins or other flood control structures shall fully prevent potential net increases in storm water runoff at the project boundary to the BNSF right of way.

~~l.~~ All detention and debris basins or other flood control structures shall be sized and located to intercept storm water flow from off-site areas as it enters and flows across the project site.

m. Existing vegetation shall be preserved to the extent possible and erosion control vegetation shall be planted where applicable. Runoff from the project site shall be controlled at all times through the use of appropriate BMP measures.

BMPs shall be established to ensure that all drainage control structures are properly maintained.

p. If it is determined that detention basins are needed, size, locate, and design each basin to allow the pass through design storm to move through the site unimpeded while capturing larger design storm flows and related sediment and debris to protect the proposed infrastructure and prevent any increase in quantity or velocity or change in location of storm water runoff or sediment transport to adjacent properties, including the BNSF right of way.

2. Ensure that all deliverables required pursuant to this condition comply with the requirements of:

the San Bernardino County Hydrology Manual and 2007 Development Code (amended, March 25, 2010);

the regulations of the County of San Bernardino Department of Public Works (CSBDPW);

all State SWPPP requirements;

FEMA Guidelines for Determining Flood Hazards on Alluvial Fans and Guidelines and Specifications for Flood Hazard Mapping Partners, Appendix G, Guidance for Alluvial Fan Flooding Analyses and Mapping. Specifically, pursuant to the FEMA-administered National Flood Insurance Program adopted by San Bernardino County, the project design shall be based on the assumption that the primary flow from the apex of the alluvial fan may flow to any single location within the site. (44 C.F.R. 65.13.)

3. Ensure that all maps, plans, surveys and site delineations shall be as current as possible and shall be at a 1”-50’ scale with current mapping to 1’ contour interval accuracy, such that depths of the washes can be accurately understood.

4. A basis of design report that shall include:

a. An analysis to quantify discharges and associated volumes of water, debris, and sediment associated with the 100-year storm at the apex of the alluvial fans under current watershed conditions. A geomorphic and hydraulic analysis to determine the maximum design storm that can be routed through the site utilizing existing fluvial washes that will not result in significant damage to proposed site infrastructure and determine the ability of the proposed site infrastructure to withstand the storm at the proposed location of said site infrastructure. The result of this analysis shall not conflict with the requirement that the project not contribute to any impacts to the BNSF right of way due to a 100-year storm.

A geotechnical report for the project site based on site investigations that includes an analysis of subsurface soil, rock, and water conditions and the effectiveness of design and construction recommendations for roadways, foundations and other improvements in preventing impacts to the BNSF right of way. The report shall contain as a minimum:

Summary of all subsurface exploration data, including subsurface soil profile, exploration logs, laboratory or in situ test results, and ground water information;

Interpretation and analysis of the subsurface data;

Specific engineering recommendations for design;

Specification of conditions for resolution of anticipated problems; and

(v) Recommended geotechnical special provisions.

A geomorphic and biologic analysis to determine the minimum design storm that can be routed through the site utilizing existing fluvial washes that will provide the necessary sediment load through the site and "downstream areas" to maintain existing sensitive habitat needs, as described in the Geomorphic Assessment of Calico Solar Project Site. This analysis must consider and address the need for fine sand to support the existing sensitive habitat and the potential episodic nature of the associated dune complex evolution that depends upon El Nino events (i.e., wet winters occurring approximately every three to seven years) delivering sediment to the lower fan and the accompanying La Nina events (i.e., dry winters

occurring approximately every three to seven years) eroding and transporting fine sands to these dunes through wind action.

A determination of the pass through design storm that can be routed through the site unimpeded to deliver the necessary sediment load through the site to maintain existing sensitive habitat needs in "downstream areas" and not result in significant damage to proposed site infrastructure.

Design of each basin or other structural controls by showing supporting calculations and design drawings to convey the basin or other structural controls in plan view, cross-sections, depth to spillway if applicable, amount of freeboard volume of structural control retention, description of sidewall slopes if applicable, method of providing pass through design storm and related sediment unimpeded, method of providing erosion protection of structural control side walls, inlet design, outlet design, spillway design, spillway erosion control, combined outlet maximum flow, transition from outlet to existing downstream fluvial wash, tortoise fence location and design, maintenance of tortoise fence, maintenance of basin, maintenance of excess sediment in structural controls from larger flood flows. Structural control shall fully prevent potential net increases in storm water flows at the project boundary to the BNSF right of way.

For all structural control features that include flood control basin dams, at a minimum:

specific locations of basins and dams on appropriate scale map,

configuration of all basins and dams including basin-specific cross sections,

a description of all materials designed to be used in the construction of the dams,

footings designs,

designs of cutoff walls,

designs of keyways,

description and design of drainage pass though methods,

flow metering (ability to maintain maximum discharge to that of the maximum on-site flow design) technique and design,

method of and design of debris deflection (i.e. trash racks) for each basin,

emergency spillway design,

pass through pipe outlet energy dissipation method and design, and basin inlet erosion protection,

basin inlet erosion protection. The project owner shall request comments from BNSF and the Department of Water Resources Division of Safety of Dams (DSOD) for the plans and specifications for the construction of any dam(s) or reservoir(s) that are under DSOD jurisdiction prior to beginning construction, and shall forward all comments to BNSF, DSOD and the CPM.

The project owner shall prepare a set of design specifications to supplement the 60-percent and 90-percent design drawings for BNSF review and comment. Plans, specifications, computations and other data shall be prepared by persons properly licensed by the State

of California. If the 60-percent or 90-percent plans and specifications do not comply with the appropriate Conditions of Certification, the necessary changes or revisions to the plans shall be made by the project owner. If the CPM finds that the work described in the plans and specifications conform to the Conditions of Certifications in the Energy Commission Decision and other pertinent LORS, then the project owner shall submit two copies of the 100- percent set for BNSF review and for CPM review and approval. All design drawings must be submitted on bound or stapled 24" x 36" size paper.

Verification: The project owner shall do all of the following:

Prior to Pre-Construction Site Mobilization ~~and before submitting the 30- percent grading, drainage, and storm water mitigation facilities drawings,~~ the project owner shall submit a basis of design report to BNSF for review~~,~~ and comment ~~as to those portions of deliverables relating to the study and requirements of **SOIL&WATER-12.** Within fifteen (15) days, the project owner shall submit the basis of design report to BNSF and~~and to the CPM for review and ~~comment~~approval. The CPM shall consider comments received from BNSF within fifteen (15) days of project owner's submittal, in approving the basis of design report.

No later than thirty (30) days after the CPM's approval of the basis of design report, the project owner shall submit preliminary (30-percent) grading, drainage, and storm water mitigation facilities drawings and accompanying basis of design report to BNSF for its review, and comment ~~as to those portions of deliverables relating to the study and requirements of **SOIL&WATER-12.** Within fifteen (15) days, the project owner shall deliver the preliminary (30-percent) grading, drainage, and storm water mitigation facilities drawings and accompanying basis of design report to BNSF and the CPM for review and comment~~and to the CPM for review and approval. The CPM shall consider comments received from BNSF within fifteen (15) days of project owner's submittal, in approving the 30-percent drawings and accompanying basis of design report.

c) No later than thirty (30) days after the CPM's approval of the 30-percent drawings, the 60-percent set of design drawings and accompanying basis of design report shall be submitted to BNSF for review, and comment ~~as to those portions of deliverables relating to the study and requirements of **SOIL&WATER-12.** Within fifteen (15) days, the project owner shall submit the 60-percent drawings percent drawings and accompanying basis of design report to BNSF and~~and to the CPM for review and ~~comment~~approval. The CPM shall consider comments received from BNSF within fifteen (15) days of the project owner's submittal, in approving the 60-percent drawings.

After the person who originally drew the plan or their duly authorized agent addresses BNSF's and the CPM's 60-percent submittal comments and the CPM's required changes, the 90-percent set of design drawings and accompanying basis of design report shall be submitted to BNSF for review~~,~~ and comment ~~as to those portions of deliverables relating to the study and requirements of **SOIL&WATER-12.** Within fifteen (15) days after delivery of the 90-percent design drawings and accompanying basis of design report to BNSF, the project owner shall submit the 90-percent drawings and accompanying basis of design report to BNSF for review and comment and~~and to

the CPM for review and approval. The CPM shall consider comments received from BNSF within fifteen (15) days of project owner's submittal, in approving the 90- percent drawings.

~~The 100-percent design drawings and specifications (construction documents) shall be signed and sealed by a Registered Professional Engineer in the State of California and a Registered Professional Geologist in the State of California and submitted as the final, approved set of construction documents prior~~Prior to Pre-Construction Site Mobilization~~. Prior to initiation of site construction~~, the 100-percent design drawings and specifications (construction documents) shall be submitted along with the final basis of design report signed and sealed by a Registered Professional Engineer and a Registered Professional Geologist in the State of California to BNSF for review, and comment ~~as to those portions of deliverables relating to the study and requirements of **SOIL&WATER12.** Fifteen (15) days after delivery of the 100-percent design drawings to BNSF, the project owner shall submit the 100-percent design drawings to BNSF and~~and to the CPM for review and ~~comment~~approval. The CPM shall consider comments received from BNSF within fifteen (15) days of project owner's submittal, in approving the 100-percent drawings. The approved 100-percent design drawings and specifications (construction documents) shall be signed and sealed by a Registered Professional Engineer in the State of California and a Registered Professional Geologist in the State of California and submitted as the final, approved set of construction documents prior to Pre-Construction Site Mobilization.

f) Thirty (30) days prior to initiation of construction of any dams that would be considered under the jurisdiction of DSOD, the project owner shall receive approval for dam construction from the CPM based on comments the CPM has received from the DSOD for dam design adequacy.

PROJECT WATER SUPPLY MONITORING

SOIL&WATER-9

The annual monitoring report required by **SOIL&WATER-7** shall include an evaluation of water supply reliability. Based on the results of this evaluation, the CPM may request the project owner develop and submit a Water Conservation and Alternative Water Supply Plan. The purpose of this plan is to curtail and minimize water use to remediate observed water level and storage declines in the water bearing zone utilized by the project until the proposed alternative supply is available.

Verification: The project owner shall provide a Water Conservation Plan within thirty (30) days after the request of the CPM. The plan shall be implemented immediately upon approval by the CPM. Part of this plan shall include suspension of[PV panel and] mirror washing until the water supply has stabilized or an alternative supply is available to provide the water. The project owner shall submit a Notice of Completion to the CPM within thirty (30) days of securing the alternative supply. The Notice of Completion shall list each plan component and document that it has been completed. Part of the documentation shall include water use records that show the conservation savings achieved. If development of an alternative water supply was part of the plan, the project owner shall provide all documentation, permits, as-

builts, proof of a contract or other right to a long term supply and test results that may be required for the water supply. The Water Conservation Plan shall remain in effect until CPM approval of the project owner's Notice of Completion.

STORM WATER PERMITS

SOIL&WATER-10 NPDES GENERAL PERMIT FOR CONSTRUCTION ACTIVITY.

The project owner shall comply with the ~~most recent requirements of the general National Pollutant~~Waste Discharge ~~Elimination System (NPDES) permit~~Requirements for discharge of storm water associated with construction activity~~. The project owner shall submit copies of all correspondence between the project owner and the State Water Resources Control Board (SWRCB) or the LRWQCB regarding this permit to BNSF and the CPM~~ that are presented in Soil and Water Appendices B, C, D and E and submit the appropriate compliance fee to the LRWQCB. The project owner shall ~~also~~ develop, obtain compliance project manager (CPM) approval of, and implement a ~~construction SWPPP~~Storm Water Pollution Prevention Plan (SWPPP) for the construction ~~on~~of the Calico ~~Solar Project main site, laydown areas, pipeline, and transmission line. The SWPPP shall include construction BMPs to prevent storm water runoff and sediment transport off the project site.~~site, laydown area, and all linear facilities.

Verification: ~~Prior to submittal of the proposed construction SWPPP to the SWRCB or the LWRQCB, the project owner shall submit the same to the CPM and BNSF for review and comment. At least ten (10)~~At least 60 days prior to ~~Pre-Construction Site Mobilization~~site mobilization, the project owner shall submit to the CPM and LRWQCB, a copy of the construction SWPPP ~~to BNSF~~ for review and~~ comment and to the~~ CPM~~ for review and~~ approval prior to site mobilization. The ~~CPM shall consider comments received within fifteen (15) days, in approving the construction SWPPP~~project owner shall also submit to the CPM evidence of payment to LRWQCB of the appropriate compliance fee. The project owner shall retain a copy of the ~~approved SWPPP on site throughout construction. Prior to submittal of the construction NPDES permit application to the SWRCB or the LRWQCB, the project owner shall submit the same to the CPM and BNSF for review and comment~~SWPPP on site. The project owner shall submit to the CPM copies of all ~~other~~ correspondence between the project owner and the ~~SWRCB or the~~ LRWQCB regarding the ~~NPDES permit~~Waste Discharge Requirements for the discharge of storm water associated with construction activity ~~to BNSF and the CPM~~ within ~~ten (~~10~~)~~ days of its receipt or submittal.~~ Copies of correspondence shall include the Notice of Intent sent to the SWRCB, the confirmation letter indicating receipt and acceptance of the Notice of Intent, any permit modifications or changes, and completion/permit Notice of Termination.~~

SOIL&WATER-1 1 INDUSTRIAL FACILITY SWPPP

The project owner shall comply with the requirements of the ~~General NPDES Permit for Discharges of Storm Water Associated with Industrial Activity, including development of an Industrial Facility SWPPP. The SWPPP shall include operational BMPS to prevent storm water runoff and sediment transport off the~~

~~project site. If the Regional or State Board finds the project does not require a General NPDES Permit for Discharges of Storm Water Associated with Industrial Activity, written confirmation from either board confirming this permit is not required would satisfy this Condition~~Waste Discharge Requirements in Soil and Water Appendices B, C, D and E, for discharges of process water and storm water associated with industrial activity. The project owner shall develop, obtain CPM approval of, and implement an industrial SWPPP for the operation of the project.

~~**Verification:** Prior to submittal of the proposed Industrial Facility SWPPP to the SWRCB or the LRWQCB~~At least 60 days prior to commercial operation, the project owner shall submit ~~the same to the CPM and BNSF for review and comment. The project owner shall submit a copy of the Industrial Facility SWPPP for operation of the project to BNSF and the CPM at least sixty (60) days prior to the start of commercial operation and~~to the CPM a copy of the industrial SWPPP for operation of the project for review and approval prior to commercial operation. The project owner shall retain a copy ~~of the approved SWPPP on site throughout the life of the project. Prior to submittal of the proposed industrial NPDES to the SWRCB or the LRWQCB, the project owner shall submit the same to the CPM and BNSF for review and comment~~on site. The project owner shall submit copies to the CPM of all ~~other~~ correspondence between the project owner and the LRWQCB regarding the ~~general NPDES permit for discharge of~~Requirements of Waste Discharge of process water and storm water associated with industrial activity ~~to BNSF and the CPM~~ within ~~ten (~~10~~)~~ days of its receipt or submittal. Copies of correspondence shall include the Notice of Intent sent by the project owner to the SWRCB~~, the confirmation letter indicating receipt and acceptance of the Notice of Intent, and any permit modifications or changes~~.

~~**HYDROLOGY STUDY**~~

~~**SOIL&WATER-12** Prior to the production of the deliverables required under SOIL&WATER13, project owner shall fund a hydrologic study commissioned by BNSF to determine the erosion and sedimentation impacts, if any, on BNSF infrastructure resulting from the project owner's planned emplacement of SunCatchers, flood control structures and runoff control measures.~~

~~**Verification:** No later than thirty (30) days prior to the production of the deliverables required under **SOIL&WATER-13,** the project owner shall fund a hydrologic study commissioned by BNSF. Within ninety (90) days of completion of the hydrologic study, the project owner shall provide documentation to the CPM that the study has been paid in full. Within thirty (30) days of completion of the hydrologic study, the results of study shall be provided to BNSF, the CPM and the project owner.~~

INFILTRATION REPORT

SOIL&WATER-1 3

Prior to the submission of the deliverables required under **SOIL&WATER-1,** project owner shall ~~submit to BNSF for review, and comment as to those portions of the~~

~~deliverables relating to the study and requirements of **SOIL&WATER-12**,~~prepare an Infiltration Report. The Infiltration Report shall include an analysis of rainfall on the project site, with the objective of quantifying the amount of change in infiltration due to the project. The report shall include a calculation of the amount of storm water runoff for 1) the existing soil conditions, 2) the temporarily disturbed conditions resulting from construction, and 3) the final conditions after the installation of PV modules and SunCatchers and the construction of roads and buildings is complete. This analysis shall be conducted using the 2-year, 5-year, 10-year, and 100- year storm intensities, considering durations of both 6 hours and 24 hours. The Infiltration Report shall identify all areas on the project site where permeability of the ground surface may be changed due to the project, including:

~~both~~ the pedestals ~~and solar concentrator dishes~~, of the SunCatchers~~;~~ and post supporting PV modules

any areas where facilities will be constructed, fill deposited, or soil compacted;

any areas which will be paved or treated with soil stabilizers or soil weighting agents; and

any other areas where construction or operational activities may result in impacts to drainage, vegetation and soil infiltration rates. The report shall include a model of soil-water flow to assess the significance of PV modules and SunCatchers, roadways, soil binders, and construction and operational activities on the effective infiltration over the project site. The amount of impervious surface created by each project feature shall be estimated by considering worst-case conditions. In the case of SunCatchers, this means considering the impact when the SunCatchers are fully ~~open to their maximum diameter of 38 feet~~deployed. In the case of untreated dirt roads, this means considering long-term compaction caused by construction and maintenance vehicles. In the case of roads treated with soil-binding agents, this means considering the permeability that results from application of the selected treatment.

The Infiltration Report shall also include an analysis based on worst-case vegetation conditions over the life of the project as affected by, without limitation, the following factors: clearance, soil compaction, shading of vegetation by PV modules and SunCatchers, relocation of precipitation by PV modules and SunCatchers, addition of water through the washing of PV module and SunCatchers mirrors, modification of storm water flow by presence ~~of~~ofmodules and SunCatchers and access and maintenance roads, use of dust suppressants, and use of weed management practices.

The Infiltration Report shall be used to determine the change in post-construction run-off caused by the project. The results of the Infiltration Report shall be considered in developing the plans and reports required pursuant to **SOIL&WATER-1** and **SOIL&WATER-8.**

Verification: At least thirty (30) days prior to submitting the deliverables required under **SOIL&WATER-1,** the project owner shall submit an Infiltration Report to BNSF for review~~,~~ and comment ~~as to those portions of the deliverables relating to the study and requirements of~~

~~**SOIL&WATER-12,** the Infiltration Report. Within thirty (30) days of delivery of the Infiltration Report to BNSF, project owner shall submit the Infiltration Report to BNSF for review and comment and~~and to the CPM for review and approval. The CPM shall consider comments received from BNSF within ~~15~~fifteen (15) days of project owner's submittal in approving the report.

ELECTRONIC DELIVERY OF DOCUMENTS

SOIL&WATER-14

All deliverables submitted by ~~applicant~~project owner pursuant to the Conditions of Certification, and all engineering plans, reports, documents, maps and surveys relied upon, shall be made available to BNSF and the CPM in electronic format. All surveys and plans shall be provided in AutoCAD, and all reports shall be provided in an editable format to the commenting parties.

CONSISTENCY OF REPORTS, STUDIES, AND PLANS

SOIL&WATER-1 5

All reports, studies, and plans submitted pursuant to SOIL & WATER Conditions of Certification **SOIL&WATER-1 – 13** and Civil Engineering Condition of Certification **CIVIL-1** and **CIVIL-4** shall be based on and utilize consistent data and assumptions. In the event of any inconsistency, the CPM shall consult with Project Owner, BNSF, and any applicable agencies and determine how to resolve the inconsistency to ensure compliance with the performance standards contained in the **SOIL & WATER** Conditions of Certification.

~~**SOIL&WATER-16**~~

~~This condition applies to Phase 1a, as defined in **BIO-31** (Project Construction and Compensation Phasing Plan). The first three paragraphs of the General Requirements of **BIO-31** shall also apply to this condition.~~

~~**A. DRAINAGE EROSION AND SEDIMENTATION CONTROL PLAN** Prior to site mobilization for Phase 1a, the project owner shall obtain the CPM's approval of a site specific Drainage, Erosion and Sediment Control Plan (DESCP) for Phase 1a that ensures protection of: 1) water quality and soil resources of the project site; 2) all linear facilities on the project site, including but not limited to, maintenance, access roads, and pedestals: 3) all other structures on the project site; and 4) adjacent properties, including the BNSF right of way. The plan shall address appropriate methods and actions, both temporary and permanent, on the project site, to meet these performance standards. The plan shall demonstrate no increase in off-site flooding potential and no increase in storm water runoff or sediment transport off the project site and onto the BNSF right of way, and identify all monitoring and maintenance activities. The project owner shall complete all necessary engineering plans, reports, and documents necessary for Burlington~~

~~Northern Santa Fe Railway (BNSF) and the CPM to conduct a review of the proposed Phase 1a and provide a written evaluation as to whether the proposed grading, drainage improvements, and flood management activities comply with all requirements presented herein. The plan shall contain the following elements:~~

- ~~**Vicinity Map:** A map shall be provided indicating the location of all Phase 1a project elements with depictions of all major geographic features to include watercourses, washes, irrigation and drainage canals, major utilities, and sensitive areas in Phase 1a.~~
- ~~**Site Delineation:** The Phase 1a site and all project elements shall be delineated showing boundary lines of all construction areas and the location of all existing and proposed structures, underground utilities, roads, and drainage facilities. Adjacent property owners shall be identified on the plan maps. All maps shall be presented at a legible scale.~~

- ~~**Drainage:** The DESCP shall include the following elements:~~

~~a. Topography. Topography for offsite areas as necessary to define the existing upstream tributary areas to the site and downstream to provide enough definition to map the existing storm water flow and flood hazard. Spot elevations shall be required where relatively flat conditions exist.~~

~~b. Proposed Grade. Proposed grade contours for Phase 1a shall be shown at a scale appropriate for delineation of onsite ephemeral washes, drainage ditches, and tie-ins to the existing topography.~~

~~c. Hydrology. Existing and proposed hydrologic calculations for Phase 1a onsite areas and offsite areas that drain to the Phase 1a area; include maps showing the drainage area boundaries and sizes in acres, topography and typical overland flow directions, and show all existing, interim, and proposed drainage infrastructure and their intended direction of flow.~~

~~d. Hydraulics. Provide hydraulic calculations to support the selection and sizing of the Phase 1a onsite drainage network, diversion facilities and Best Management Practices (BMPs) to control construction related impacts related to Phase 1a.~~

- ~~**Watercourses and Critical Areas:** The DESCP shall show the location of all Phase 1a onsite and nearby watercourses including washes, irrigation and drainage canals, and drainage ditches, and shall indicate the proximity of those features to the Phase 1a construction site.~~
- ~~**Clearing and Grading:** The plan shall provide a delineation of all Phase 1a areas to be cleared of vegetation, areas to be preserved, and areas where vegetation would be cut to allow clear movement of the heliostats. The plan shall provide elevations, slopes, locations, and extent of all proposed grading in Phase 1a as shown by contours, cross-sections, cut/fill depths or other means. The locations of any disposal areas, fills, or other special features in Phase 1a shall also be shown. Existing and proposed topography tying in proposed contours~~

~~with existing topography in Phase 1a shall be illustrated. The DESCP shall include a statement of the quantities of material excavated in Phase 1a, whether such excavations or fill is temporary or permanent, and the amount of such material to be imported or exported or a statement explaining that there would be no clearing and/or grading conducted for each element of the project. Areas of no disturbance in Phase 1a shall be properly identified and delineated on the plan maps.~~

~~**Soil Wind and Water Erosion Control:** The plan shall address exposed soil treatments to be used during construction of Phase 1a for both road and nonroadnonroad surfaces including the specific identification of all chemicalbased dust palliatives, soil bonding, and weighting agents appropriate for use at the proposed project site that would not cause adverse effects to vegetation. BMPs shall include measures designed to prevent wind and water erosion including application of chemical dust palliatives after rough grading to limit water use. All dust palliatives, soil binders, and weighting agents shall be approved by the CPM prior to use. With regard to erosion risk and stormwater runoff, the plans shall identify storm water management facilities, if any, that are necessary to ensure no adverse water quality impacts either onsite or offsite will result from construction of Phase 1a. On-site roadways and other infrastructure in Phase 1a shall be designed and located to avoid existing and proposed flow paths to the extent feasible.~~

~~**Project Schedule:** The DESCP for Phase 1a shall identify on the topographic site map the location of the site-specific BMPs to be employed during Phase 1a construction (initial grading, project element construction, and final grading/stabilization). This scheduling should require the installation of any necessary storm water management facilities, identified in the plans, before construction commences on Phase 1a.~~

~~**Best Management Practices:** The DESCP for Phase 1a shall show the location, timing, and maintenance schedule of all erosion- and sediment-control BMPs to be used in Phase 1a prior to initial grading, during project element excavation and construction, during final grading/stabilization, and after construction. BMPs shall include measures designed to control dust and stabilize construction access roads and entrances. The maintenance schedule for Phase 1a shall include post-construction maintenance of treatment-control B-M-Ps applied to disturbed areas of Phase 1a following construction.~~

~~**Erosion Control Drawings:** The erosion-control drawings and narrative for Phase 1a shall be designed, stamped and sealed by a professional engineer or erosion-control specialist.~~

~~**Comments:** The DESCP for Phase 1a shall include copies of recommendations, conditions, and provisions from the BNSF, County of San Bernardino, California Department of Fish and Game (CDFG), and Lahontan Regional Water Quality Control Board (RWQCB). • **Monitoring Plan:** Monitoring activities for Phase 1a shall include routine measurement of the volume of accumulated sediment in the onsite drainage ditches, and storm water diversions and the requirements specified in SSA Soil and Water Appendicies B, C, and D.~~

~~**Verification A:** The DESCP for Phase 1a shall clearly show approval by the chief building official (CBO). In addition, the project owner shall do all of the following:~~

~~a) No later than 30 days prior to start of site mobilization of Phase 1a, the project owner shall submit a copy of the DESCP to the County of San Bernardino, the RWQCB, BNSF and the CPM for review and comment. The CPM shall consider comments received within 15 days in approving the plan.~~

~~b) During construction of Phase 1a, the project owner shall provide BNSF and the CPM an analysis in the monthly compliance report on the effectiveness of the drainage-, erosion- and sediment-control measures and the results of monitoring and maintenance activities.~~

~~c) The project owner shall provide BNSF and the CPM with two copies each of all monitoring or other reports required for compliance with San Bernardino County, CDFG, and RWQCB.~~

~~**B. STORMWATER CONTROL/FLOOD PROTECTION DESIGN PLANS:** The project owner shall submit two copies of the 30-percent, 60- percent and 90- percent design drawings for the grading and drainage facilities of Phase 1a to BNSF and the CPM for review and comment. The 30-percent, 60-percent and 90-percent design drawings for the grading and drainage facilities for Phase 1a shall be accompanied by a basis of design report to convey and support the design approach. To prepare the grading and drainage facilities drawings and accompanying basis of design report for Phase 1 a, the project owner shall do the following:~~

~~1. At a minimum, the design report shall ensure Phase 1a meets the following performance standards:~~

~~a. Construction of Phase 1a shall not alter the existing watershed boundaries.~~

~~c. Construction of Phase 1a shall not adversely affect any railroad structures through changes in the volume or velocity of storm water runoff reaching the railroad structure. No SunCatcher shall be placed in an area where approved hydrologic studies indicate the water surface resulting from a 100 year, 24-hour storm could be more than 1.5 feet above the pre-storm ground surface.~~

~~d. Post development runoff from Phase 1a shall be equal to or less than predevelopment runoff.~~

~~e. Post development sediment transport through Phase 1a shall be equal to predevelopment sediment transport.~~

~~f. At a minimum, all storm water, hydraulic and drainage reports used for project development shall comply with the requirements of the San Bernardino County Drainage Manual (SBCDM).~~

~~2. Conduct an analysis of Phase 1a to quantify the design discharges and associated volumes of water, debris, and sediment associated with the 100-year storm at the apex of the fan under current watershed conditions.~~

~~3. Conduct a geomorphic and hydraulic analysis of Phase 1a to determine the maximum design storm that can be routed through Phase 1a utilizing existing fluvial washes that will not result in significant damage to proposed Phase 1a infrastructure.~~

~~4. Conduct a geomorphic and biologic analysis to determine the minimum design storm that can be routed through Phase 1a utilizing existing fluvial washes that will provide the necessary sediment load through Phase 1a and "downstream areas" to maintain existing sensitive habitat needs, as described in the *Geomorphic Assessment of Calico Solar Project Site*. This analysis must consider and address the need for fine sand to support the existing sensitive habitat and the potential episodic nature of the associated dune complex evolution that depends upon El Niño events (i.e., wet winters occurring approximately ree to seven years) delivering sediment to the lower fan and the accompanying La Niña events (i.e., dry winters occurring approximately every three to seven years) eroding and transporting fine sands to these dunes through wind action.~~

~~5. Determine the pass through design storm that can be routed through Phase 1a unimpeded to deliver the necessary sediment load through Phase 1a to maintain existing sensitive habitat needs in "downstream areas" and not result in significant damage to Phase 1a infrastructure.~~

~~6. The project owner shall prepare a set of design specifications to supplement the 90-percent design drawings for Phase 1a. Plans, specifications, computations and other data shall be prepared by persons properly licensed by the State of California. If the 60-percent plans or 90-percent plans and specifications for Phase 1a do not comply with the appropriate Conditions of Certification, the necessary changes or revisions to the plans shall be made by the project owner. If the CPM finds that the work described in the plans and specifications conform to the Conditions of Certifications in the Energy Commission Decision and other pertinent LORS, then the project owner shall submit two copies of the 100- percent set for CPM review and approval. All design drawings must be submitted on bound or stapled 24" x 36" size paper.~~

~~**Verification B:** Prior to site mobilization for Phase 1a, the project owner shall prepare preliminary (30-percent) grading and drainage facilities drawings and accompanying basis of design report for BNSF review and CPM review and approval. No later than 30 days after publication of the Energy Commission Decision, the 60-percent set of design drawings and accompanying basis of design report for Phase 1a shall be submitted to the BNSF for review and CPM for review and approval. The project owner shall submit the 90-percent design drawings and accompanying basis of design report for Phase 1a to BNSF for review and the CPM for review and approval after the person who originally drew the plan or their duly authorized agent addresses the CPM's 60-percent submittal comments and required changes. The 100-percent design drawings and specifications (construction documents) for Phase 1a shall be signed and sealed by a Registered Professional Engineer in the State of California and submitted~~

~~as the final, approved set of construction documents prior to site mobilization for Phase 1a. Prior to initiation of sites (construction documents) shall be submitted along with the final basis of design report signed and sealed by a Registered Professional Engineer and a Registered Professional Geologist in the State of California to the CPM for review and approval.~~

4.5.7 References Cited

Westwood. Drainage, Erosion and Sediment Control Plan, December 15. 2010.

4.6 BIOLOGICAL RESOURCES

The following paragraphs describe the potential changes in impact to biological resources within the boundaries of the Project site under the Modified Project as compared to the Approved Project and will remain less than significant.

4.6.1 Summary of Project Changes Related to Biology

Under the Modified Project, changes that require consideration with respect to biological resources include changes to the roadway layout and solar collector access (resulting in changes to ground disturbance); changes in brush trimming; reduction or elimination of transmission towers; and changes in the timing of individual desert tortoise translocations.

Under the Modified Project, the engineering design changes to the Project layout and facilities components would not alter the Project boundaries, depth of excavation, extent of construction, and overall levels of disturbance from those identified under the Approved Project. The locations of the roads would be altered due to changes in the Project layout (as shown on Figure 2-2) and the amount of and location of ground disturbance would change. However, the overall disturbed area would remain less than 70 percent. The Project changes under the Modified Project would decrease the total length of improved roads required and increase the total length of unimproved module access points throughout the Project. In total, these changes would decrease the Project's impacts to State jurisdictional waters (*i.e.*, ephemeral drainages) that would occur within the Project site.

The proposed partial technology change to PV modules under the Modified Project would require a larger area of brush trimming during construction than would the Approved Project, and less brush trimming during Project operations. Under the Modified Project, as a result of the proposed relocation of the Project substation to a site near the Pisgah Substation, 0 to 3, rather than 12 to 15, transmission towers would be required.

Because the phases of construction would be changed under the Modified Project, the timing of translocations of individual desert tortoises would change, although the total number of desert tortoises affected would not change.

4.6.2 Changes in Environmental Impacts

In the Commission Decision, the Commission concluded that there would be potential impacts from Project-related activities on biological resources, including impacts to state jurisdictional waters and desert wash vegetation, state- and federally-listed species, and other sensitive species, (Commission Decision, page 232). Throughout the regulatory review process, reductions were made to the Project footprint to avoid environmentally sensitive areas and reduce biological impacts. The Modified Project would cause the same or somewhat reduced impacts to biological resources compared to the Approved Project.

Under the Modified Project, it is anticipated that the permanent impacts to state jurisdictional waters would decrease from 152.3 acres to 90.2 acres (Figure 4.6-1).

The changes under the Modified Project would not increase impacts to desert vegetation. Although a greater number of shrubs would require trimming during construction, compared to the Approved Project, Condition BIO-28, requiring vegetation restoration, would be applied and would mitigate this impact. During operations, vegetation trimming under the Modified Project would be substantially reduced compared to the Approved Project; Condition BIO-28 would also apply during operations. The Modified Project would not result in an increase in impacts to vegetation.

Because the number of transmission towers needed for the Modified Project would be 0 to 3 rather than 12 to 15 under the Approved Project, potential impacts from bird and bat collisions with the towers would be reduced. Potential perches for common ravens, which prey on other species, including sensitive species, would also be reduced.

The proposed change in construction phasing under the Modified Project would have two effects with respect to desert tortoise translocations. Fewer tortoises would be translocated in Phase 1 and more would be translocated in Phase 2, compared to the Approved Project. Because construction of Phase 2 is not anticipated to begin until 2013, this change would allow time for adaptive management to benefit more tortoises as desert tortoise translocation practices continue to evolve.

With the Conditions, and considering that no increase to the Project footprint, boundaries, or overall disturbance would occur, no increase in impacts to biological resources would occur under the Modified Project.

4.6.3 Changes in Cumulative Environmental Impacts

The Commission Decision concluded that the Approved Project would not result in any significant cumulative impacts to biological resources. Incremental impacts of the Modified Project on biological resources are expected to be the same or slightly reduced compared to the Approved Project. As described in Section 4.23, Cumulative Scenario, no new reasonably foreseeable future actions beyond those assumed in the Commission Decision have been identified. Therefore, no increase in cumulative impacts under the Modified Project is anticipated.

4.6.4 Changes in LORS

In the Commission Decision, the Commission concluded that, with the implementation of the Conditions, the Approved Project would comply with all applicable LORS. The Commission identified the LORS listed below associated with biological resources.

1. The project owner will implement appropriate avoidance and mitigation measures to prevent significant adverse impacts to all sensitive species.
2. With implementation of the mitigation measures described in the evidentiary record and incorporated into the Conditions below, as well as those in other portions of this Decision, the Project will not result in significant direct, indirect, or cumulative impacts to biological resources.
3. With implementation of the mitigation measures described in the evidentiary record and incorporated into the Conditions, the Approved Project will conform to all applicable laws, ordinances, regulations, and standards related to biological resources as identified above.

Under the Approved Project, two permits were identified as being required: an Incidental Take Permit and a Lake and Streambed Alteration Agreement from the CDFG. Both of these permits were identified in the Commission Decision and in the Biological Opinion (BO) reached by the United States Fish and Wildlife Service. Under the Modified Project, these two permits and the BO would need to be revised to address the Project changes.

4.6.5 Changes in Proposed Mitigation

No new or more severe impacts requiring additional mitigation are anticipated to result from the Modified Project. The mitigation measures proposed in the Commission Decision would mitigate impacts associate with the Modified Project to levels that would be insignificant.

4.6.6 Changes in Conditions of Certification

The conforming changes to the Conditions for the Modified Project related to biological resources are:

DESIGNATED BIOLOGIST SELECTION

BIO-1 The project owner shall assign at least one Designated Biologist to the project. The project owner shall submit the resume of the proposed Designated Biologist, with at least three references and contact information, to the Energy Commission Compliance Project Manager (CPM) and the Bureau of Land Management's (BLM's) Wildlife Biologist for approval in consultation with the California Department of Fish and Game (CDFG) and U.S. Fish and Wildlife Service (USFWS).

The Designated Biologist must meet the following minimum qualifications: Bachelor's degree in biological sciences, zoology, botany, ecology, or a closely related field;

Three years of experience in field biology or current certification of a nationally recognized biological society, such as The Ecological Society of America or The Wildlife Society;

Have at least one year of field experience with biological resources found in or near the project area;

Meet the current USFWS Authorized Biologist qualifications criteria (http://www.fws.gov/ventura/speciesinfo/protocols guidelines), demonstrate familiarity with protocols and guidelines for the desert tortoise, and be approved by the USFWS; and

Possess a California ESA Memorandum of Understanding pursuant to Section 208 1(a) for desert tortoise.

In lieu of the above requirements, the resume shall demonstrate to the satisfaction of BLM's Wildlife Biologist and the CPM, in consultation with CDFG and USFWS, that the proposed Designated Biologist or alternate has the appropriate training and background to effectively implement the conditions of certification.

Verification: No fewer than 30 days prior to ~~construction-related ground disturbance~~Pre-Construction Site Mobilization, the Designated Biologist(s) shall complete a USFWS Desert Tortoise Authorized Biologist Request Form (http://www.fws.gov/ventura/speciesinfo/protocols guidelines) and submit it to the USFWS, BLM's Wildlife Biologist, and the CPM for review and final approval.

The project owner shall submit the resume of the Designated Biologist to the CPM and BLM ~~within 7 days of receiving the Energy Commission Decision. No~~30 days prior to Pre-Construction Site Mobilization. No site mobilization activities such as installation of fencing, construction~~-related~~ trailers, limited ground disturbance, such as grading~~, boring, or~~ and trenching associated with pre-construction activities shall commence until an approved Designated Biologist is available to be on site.

If a Designated Biologist needs to be replaced, the specified information of the proposed replacement must be submitted to BLM's Wildlife Biologist and the CPM as soon as possible prior to the termination or release of the Designated Biologist. In an emergency, the project owner shall immediately notify the BLM's Wildlife Biologist and the CPM to discuss the qualifications and approval of a short-term replacement while a permanent Designated Biologist is proposed to BLM's Wildlife Biologist and the CPM and for consideration.

DESIGNATED BIOLOGIST DUTIES

BIO-2 The project owner shall ensure that the Designated Biologist performs the activities described below during any site mobilization activities, construction-related ground disturbance, grading, boring, or trenching activities. The Designated Biologist may be assisted by the approved Biological Monitor(s) but remains the contact for the project owner, BLM's Wildlife Biologist, and the CPM. The Designated Biologist Duties shall include the following:

Advise the project owner's Construction and Operation Managers on the implementation of the biological resources conditions of certification;

Consult on the preparation of the Biological Resources Mitigation Implementation and Monitoring Plan (BRM IMP) to be submitted by the project owner;

3. Be available to supervise, conduct, and coordinate mitigation, monitoring, and other biological resources compliance efforts, particularly in areas requiring

avoidance or containing sensitive biological resources, such as special-status species or their habitat;

Clearly mark sensitive biological resource areas and inspect these areas at appropriate intervals for compliance with regulatory terms and conditions;

Inspect active construction areas where animals may have become trapped prior to construction commencing each day. At the end of the day, inspect for the installation of structures that prevent entrapment or allow escape during periods of construction inactivity. Periodically inspect areas with high vehicle activity (e.g., parking lots) for animals in harm's way;

Notify the project owner, the BLM's Wildlife Biologist and the CPM of any non-compliance with any biological resources condition of certification;

Respond directly to inquiries of BLM's Wildlife Biologist and the CPM regarding biological resource issues;

Maintain written records of the tasks specified above and those included in the BRMIMP. Summaries of these records shall be submitted in the Monthly Compliance Report and the Annual Compliance Report to both the CPM and BLM Wildlife Biologist;

Train the Biological Monitors as appropriate, and ensure their familiarity with the BRMIMP, Worker Environmental Awareness Program (WEAP) training, and USFWS guidelines on desert tortoise surveys and handling procedures (http://www.fws.gov/ventura/speciesinfo/protocols guidelines); and

10. Maintain the ability to be in regular, direct communication with representatives of CDFG, USFWS, BLM's Wildlife Biologist, and the CPM, including notifying these agencies of dead or injured listed species and reporting special-status species observations to the California Natural Diversity Data Base.

Verification: The Designated Biologist shall provide copies of all written reports and summaries that document biological resources compliance activities in the Monthly Compliance Reports submitted to BLM's Wildlife Biologist and the CPM. If actions may affect biological resources during operation a Designated Biologist shall be available for monitoring and reporting. During project operation, the Designated Biologist shall submit record summaries in the Annual Compliance Report unless his or her duties cease, as approved by BLM's Wildlife Biologist and the CPM.

BIOLOGICAL MONITOR QUALIFICATIONS

BIO-3 The Designated Biologist shall submit the resume, at least three references, and contact information of each of the proposed Biological Monitors to BLM's Wildlife Biologist and the CPM. The resume shall demonstrate, to the satisfaction of the BLM's Wildlife Biologist and the CPM, the appropriate education and experience to accomplish the assigned biological resource tasks. The Biological Monitor is the equivalent of the USFWS designated Desert Tortoise Monitor (USFWS 2008c).

Biological Monitor(s) training by the Designated Biologist shall include familiarity with the conditions of certification, BRM IMP, WEAP, and USFWS guidelines on desert tortoise surveys and handling procedures (http://www.fws.gov/ventura/speciesinfo/protocols guidelines).

Verification: The project owner shall submit the specified information to the BLM's Wildlife Biologist and the CPM for approval at least 30 days prior to the ~~start of any site mobilization or construction-related ground disturbance, grading, boring, and trenching~~Pre-Construction Site Mobilization. The Designated Biologist shall submit a written statement to BLM's Wildlife Biologist and the CPM confirming that individual Biological Monitor(s) has been trained including the date when training was completed. If additional biological monitors are needed during construction, the specified information shall be submitted to BLM's Wildlife Biologist and the CPM for approval at least 10 days prior to their first day of monitoring activities.

BIOLOGICAL MONITOR DUTIES

BIO-4 The Biological Monitors shall assist the Designated Biologist in conducting surveys and in monitoring of site mobilization activities, construction-related ground disturbance, grading, boring, or trenching. The Designated Biologist shall remain the contact for the project owner, BLM's Wildlife Biologist, and the CPM.

Verification: The Designated Biologist shall submit in the Monthly Compliance Report to BLM's Wildlife Biologist and the CPM~~ and~~ copies of all written reports and summaries that document biological resources compliance activities, including those conducted by Biological Monitors. If actions may affect biological resources during ~~operation~~operations, a Biological Monitor~~,~~ under the supervision of the Designated Biologist, shall be available for monitoring and reporting. During project operation, the Designated Biologist shall submit record summaries in the Annual Compliance Report unless their duties cease, as approved by BLM's Wildlife Biologist and the CPM.

DESIGNATED BIOLOGIST AND BIOLOGICAL MONITOR AUTHORITY

BIO-5 The project owner's construction/operation manager shall act on the advice of the Designated Biologist and Biological Monitor(s) to ensure conformance with the biological resources conditions of certification. The Designated Biologist shall have the authority to immediately stop any activity that is not in compliance with these conditions and/or order any reasonable measure to avoid take of an individual of a listed species. If required by the Designated Biologist and/or Biological Monitor(s), the project owner's construction/operation manager shall halt all site mobilization, ground disturbance, grading, boring, trenching, and operation activities in areas specified ~~by the Designated Biologist~~. The Designated Biologist shall:

Require a halt to all activities in any area when determined that there would be an unauthorized adverse impact to biological resources if the activities continued;

Inform the project owner and the construction/operation manager when to resume activities; and

Notify BLM's Wildlife Biologist and the CPM if there is a halt of any activities and advise them of any corrective actions that have been taken or would be instituted as a result of the work stoppage.

If the Designated Biologist is unavailable for direct consultation, the Biological Monitor shall act on behalf of the Designated Biologist.

Verification: The project owner shall ensure that the Designated Biologist or Biological Monitor notifies BLM's Wildlife Biologist and the CPM immediately (and no later than the morning following the incident, or Monday morning in the case of a weekend) of any non-compliance or a halt of any site mobilization, ground disturbance, grading, construction, and operation activities. The project owner shall notify BLM's Wildlife Biologist and the CPM of the circumstances and actions being taken to resolve the problem.

Whenever corrective action is taken by the project owner, a determination of success or failure would be made by BLM's Wildlife Biologist and the CPM within five working days after receipt of notice that corrective action is completed, or the project owner would be notified by BLM's Wildlife Biologist and the CPM that coordination with other agencies would require additional time before a determination can be made.

WORKER ENVIRONMENTAL AWARENESS PROGRAM (WEAP)

BIO-6 The project owner shall develop and implement a Project-specific Worker Environmental Awareness Program (WEAP) and shall secure approval for the WEAP from BLM's Wildlife Biologist and the CPM. The WEAP shall be

administered to all onsite personnel including surveyors, construction engineers, employees, contractors, contractor's employees, supervisors, inspectors, subcontractors, and delivery personnel. The WEAP shall be implemented during site preconstruction, construction, operation, and closure. The WEAP shall:

1. Be developed by or in consultation with the Designated Biologist and consist of an on-site or training center presentation in which supporting written material and electronic media, including photographs of protected species, is made available to all participants;

Discuss the locations and types of sensitive biological resources on the project site and adjacent areas, and explain the reasons for protecting these resources; provide information to participants that no ~~snakes, reptiles, or other~~ wildlife shall be harmed;

Place special emphasis on avoidance of desert tortoises, Mojave fringe-toed lizards, burrowing owls, golden eagles, nesting birds, badgers, and white-margined beardtongue, including information on physical characteristics, distribution, behavior, ecology, sensitivity to human activities, legal protection, penalties for violations, reporting requirements, and protection measures;

Include a discussion of fire prevention measures to be implemented by workers during project activities; ~~request~~require workers dispose of cigarettes and cigars appropriately and not leave them on the ground or buried;

Require all property owner's contractors and employees to participate in BNSF's environmental sensitivity training program prior to commencing work at the Project site;

Describe the temporary and permanent habitat protection measures to be implemented at the project site;

Identify whom to contact if there are further comments and questions about the material discussed in the program;

Include printed training materials, including photographs and brief descriptions of desert tortoises, Mojave fringe-toed lizards, burrowing owls, golden eagles, nesting birds, badgers, and white-margined beardtongue, including behavior, ecology, sensitivity to human activities, legal protection, penalties for violations, reporting requirements, and protection measures;

Prominently display posters and descriptions in offices, conference rooms, employee break rooms, and other areas where employees may congregate of desert tortoises, Mojave fringe-toed lizards, burrowing owls, golden eagles, nesting birds, badgers, and white-margined beardtongue, including behavior, ecology, sensitivity to human activities, legal protection, penalties for violations, reporting requirements, and protection measures; and

Include a training acknowledgment form to be signed by each worker indicating that they received training and shall abide by the guidelines.

The specific program can be administered by a competent individual(s) acceptable to the Designated Biologist.

Verification: ~~Within 7 days of publication of the Energy Commission's License Decision, or the Record of Decision/ROW Issuance, whichever comes first~~30 days prior to Pre-Construction Site Mobilization, the project owner shall provide to BLM's Wildlife Biologist and the CPM a copy of the final WEAP and all supporting written materials and electronic media prepared or reviewed by the Designated Biologist and a resume of the person(s) administering the program.

The project owner shall provide in the Monthly Compliance Report the number of persons who have completed the training in the prior month and a running total of all persons who have completed the training to date. At least 10 days prior to ~~construction-related ground-disturbance activities~~Pre-Construction Site Mobilization the project owner shall submit two copies of the BLM- and CPM-approved final WEAP. Training acknowledgement forms signed during construction shall be kept on file by the project owner for at least 6 months after the start of commercial operation.

Throughout the life of the project, the WEAP shall be repeated annually for permanent employees, and shall be routinely administered within one week of arrival to any new construction personnel, foremen, contractors, subcontractors, and other personnel potentially working within the project area. Upon completion of the orientation, employees shall sign a form stating that they attended the program and understand all protection measures. These forms shall be maintained by the project owner and shall be made available to BLM's Wildlife Biologist and the CPM upon request. Workers shall receive and be required to visibly display a hardhat sticker or carry a certificate on their person that they have completed the training.

During project operation, signed statements for operational personnel shall be kept on file for 6 months following the termination of an individual's employment.

BIOLOGICAL RESOURCES MITIGATION IMPLEMENTATION AND MONITORING PLAN

BIO-7 The project owner shall develop a Biological Resources Mitigation Implementation and Monitoring Plan (BRM IMP), and shall submit two copies of the proposed BRMIMP to the ~~BLM~~ BLMs Wildlife Biologist and the CPM for review and approval. The project owner shall implement the measures identified in the approved BRMIMP. The BRMIMP shall incorporate avoidance and minimization measures described in final versions of (as applicable) the

Hazardous Materials Plan; the Revegetation Plan; the Weed Management Plan; the Special-Status Plant Protection and Monitoring Plan; the Special-Status Plant Remedial Action Plan; the Seed Collection Plan; the Protected Plant Salvage Plan; the Desert Tortoise Translocation Plan; the Raven Monitoring, Management, and Control Plan; the Burrowing Owl Monitoring and Mitigation~~ Plan; the Burrowing Owl Relocation Area Management~~ Plan; the Bighorn Sheep Mitigation Plan; the Streambed Management Plan; Frac-Out Contingency Plan; and the Evaporation Pond Design, Monitoring, and Management Plan.

The BRMIMP shall be prepared in consultation with the Designated Biologist and shall include accurate and up-to-date maps depicting the location of sensitive biological resources that require temporary or permanent protection during construction and operation. The BRMIMP shall include complete and detailed descriptions of the following:

All biological resources mitigation, monitoring, and compliance measures proposed and agreed to by the project owner;

All biological resources conditions of certification identified as necessary to avoid or mitigate impacts;

All biological resource mitigation, monitoring, and compliance measures required in federal agency terms and conditions, such as those provided in the USFWS Biological Opinion, the CDFG 2080.1 consultation, and BLM stipulations;

All sensitive biological resources to be impacted, avoided, or mitigated by project construction, operation, and closure;

All required mitigation measures for each sensitive biological resource;

All measures that shall be taken to avoid or mitigate temporary disturbances from construction activities;

Duration for each type of monitoring and a description of monitoring methodologies and frequency;

Performance standards to be used to help decide if/when proposed mitigation is or is not successful;

~~All performance standards and remedial~~Remedial measures to be implemented if performance standards are not met;

Biological resources-related facility closure measures including a description of funding mechanism(s);

~~11.~~ 10. A process for proposing ~~plan~~ BRMIMP modifications to BLM's Wildlife Biologist and the CPM and appropriate agencies for review and approval; and

~~12.~~ 11. A requirement to submit any incidental sightings of any special-status species that are observed on or in proximity to the project site during project construction, operation, or during ~~project~~focused surveys conducted as part of the project's mitigation measures, to the California Natural Diversity Data Base (CNDDB) per CDFG requirements.

12. A Frac-Out Contingency Plan approved by the CPM in consultation with CDFG prior to commencement of construction of the water pipeline for horizontal directional drilling under the BNSF railroad tracks.

Verification: The project owner shall submit the final BRMIMP to BLM's Wildlife Biologist and the CPM at least 30 days prior to start of any ~~preconstruction site mobilization and construction-related ground disturbance, grading, boring, and trenching~~Pre-Construction Site Mobilization. The BRMIMP shall contain all of the required measures included in all biological Conditions of Certification. No construction-related ground disturbance, grading, boring, or trenching may occur prior to approval of the final ~~BRM IMP~~BRMIMP by BLM's Wildlife Biologist and the CPM.

If any permits have not yet been received when the BRMIMP is first submitted, these permits shall be submitted to BLM's Wildlife Biologist and the CPM within five days of their receipt, and the BRM IMP shall be revised or supplemented to reflect the permit conditions within at least 10 days of their receipt by the project owner. Ten days prior to site and related facilities mobilization, the revised BRM IMP shall be resubmitted to BLM's Wildlife Biologist and the CPM.

To verify that the extent of construction disturbance does not exceed that described in this analysis, the project owner shall submit aerial photographs, at an approved scale, taken before and after construction to the CPM and BLM's Wildlife Biologist. The first set of aerial photographs shall reflect site conditions prior to any preconstruction site mobilization and construction-related ground disturbance, grading, boring, ~~and~~or trenching, and shall be submitted at least 30 days prior to initiation of such activities. Aerials shall be at a scale of 1:6000, on 11x17, 2 copies with 1 electronic, reference map, reference key on each aerial and a project boundary included. Electronic files shall be provided as shapefiles and/or GO database files. The second set of aerial photographs shall be taken subsequent to completion of construction, and shall be submitted to the CPM and BLM's Wildlife Biologist no later than 90 days after completion of construction. The project owner shall also provide a final accounting of the acreages of vegetation communities/cover types present before and after construction and a depiction of the approved project boundaries superimposed on the post project aerial photograph. If final acreages and/or disturbance footprints exceed those

previously approved, the project owner shall coordinate with staff, CDFG, and USFWS to determine appropriate mitigation for such impacts. Such mitigation may exceed the requirements as outlined in these Conditions of Certification (i.e., higher mitigation ratios may be imposed at the discretion of the wildlife agencies).

~~Verification:~~ Any changes to the approved BRMIMP (including the project footprint) must be approved by BLM's Wildlife Biologist and the CPM and in consultation with CDFG and USFWS before such action is taken. Implementation of BRMIMP measures (for example, construction activities that were monitored, species observed) shall be reported in the Monthly Compliance Reports by the Designated Biologist. Within 30 days after completion of project construction, the project owner shall provide to BLM's Wildlife Biologist and the CPM, for review and approval, a written Construction Termination Report identifying which items of the BRMIMP have been completed, summarizing all modifications to mitigation measures made during the project's preconstruction site mobilization and construction-related ground disturbance, grading, boring, and trenching, naming any mitigation and monitoring items still outstanding, and providing a timeline for implementing outstanding items. The project owner shall coordinate with the CPM and BLM's Wildlife Biologist to revise and finalize the Construction Termination Report to fulfill its reporting requirements ~~to be outlined in the BRIMP~~.

IMPACT AVOIDANCE AND MINIMIZATION MEASURES

BIO-8 The project owner shall undertake the following measures to manage the construction site and related facilities in a manner to avoid or minimize impacts to biological resources. All measures shall be subject to review and approval by the CPM.

Limit Disturbance Areas and Perimeter Fencing. The boundaries of all areas to be disturbed (including staging areas, access roads, and sites for temporary placement of spoils) shall be delineated with stakes and flagging prior to construction activities in consultation with the Designated Biologist. Spoils and topsoil shall be stockpiled in disturbed areas lacking native vegetation and which do not provide habitat for special-status species. Parking areas, staging and disposal site locations shall similarly be located in areas without native vegetation or special-status species habitat. All disturbances, project vehicles, and equipment shall be confined to the flagged areas. Tortoise fencing shall be placed along the outside perimeter of the access road that would provide access to areas ~~north~~outside of the designated project site.

Minimize Road Impacts. New and existing roads that are planned for construction, widening, or other improvements shall not extend beyond the flagged impact area as described above. All vehicles passing or turning around would do so within the planned impact area or in previously disturbed areas. Where new access is

required outside of existing roads or the construction zone, the route shall be clearly marked (i.e., flagged and/or staked) prior to the onset of construction.

Minimize Traffic Impacts. Vehicular traffic during project construction and operation shall be confined to existing designated routes of travel to and from the project site, and cross country vehicle and equipment use outside designated work areas shall be prohibited. The speed limit shall not exceed 25 miles per hour within the project area, on maintenance roads for linear facilities, or on access roads to the project site. Speed limits on paved roads shall be ~~consisted~~consistent with posted speed limits.

Monitor During Construction. Due to the likelihood that juvenile desert tortoises may persist on the site after desert tortoise clearance surveys and exclusion fencing are completed, the Designated Biologist or Biological Monitor shall be present at the construction site during all project activities that have potential to disturb soil, vegetation, and wildlife. The Designated Biologist or Biological Monitor shall walk immediately ahead of equipment during initial brushing and grading activities. Any time over the life of the project that a desert tortoise is found within the exclusion fencing, the Designated Biologist shall immediately contact the CPM, CDFG, BLM and USFWS; monitor the tortoise's location and activities; and implement translocation of the animal in accordance with and the approved Desert Tortoise Translocation Plan and in consultation with the USFWS, CDFG, BLM, and CPM.

Minimize Impacts of Transmission/Pipeline Alignments, Roads, Staging Areas. Staging areas for construction on the plant site shall be within the area that has been fenced with desert tortoise exclusion fencing and cleared for tortoise. For construction activities outside of the plant site (transmission line, pipeline alignments) access roads, pulling sites, and storage and parking areas shall be designed, installed, and maintained with the goal of minimizing impacts to native plant communities and sensitive biological resources. Transmission lines and all electrical components shall be designed, installed, and maintained in accordance with the Avian Power Line Interaction Committee's (APLI C's) S*uggested Practices for Avian Protection on Power Lines* (APLIC 2006) and *Mitigating Bird Collisions with Power Lines* (APLIC 2004) to reduce the likelihood of large bird electrocutions and collisions.

Avoid Use of Toxic Substances. Soil bonding and weighting agents used on unpaved surfaces shall be non-toxic to wildlife and plants.

Minimize Lighting Impacts. Facility lighting shall be designed, installed, and maintained to prevent side casting of light towards wildlife habitat.

Avoid Vehicle Impacts to Desert Tortoise. Parking and storage shall occur within the area enclosed by desert tortoise exclusion fencing to the extent feasible. No vehicles or construction equipment parked outside the fenced area shall be moved prior to an inspection of the ground beneath the vehicle for the presence of desert tortoise. If a desert tortoise is observed, it shall be left to move on its

own. If it does not move within 15 minutes, a Designated Biologist or Biological Monitor under the Designated Biologist's direct supervision may remove and relocate the animal to a safe location if temperatures are within the range described in the USFWS' 2009 *Desert Tortoise Field Manual* (http:www.fws.gov/ventura/speciesinfo/protocols_guidelines). All tortoise translocation will be consistent with the measures identified in the Desert Tortoise Translocation Plan. All access roads outside of the fenced project footprint shall be delineated with temporary desert tortoise exclusion fencing on either side of the access road, unless otherwise authorized by the CPM, BLM's Wildlife Biologist, USFWS, and CDFG.

9. Avoid Wildlife Pitfalls:

Avoid Wildlife Entrapment. At the end of each work day, the Designated Biologist or Biological Monitor shall ensure that all potential wildlife pitfalls (trenches, bores, and other excavations) have been backfilled. If backfilling is not done, all trenches, bores, and other excavations shall be sloped at a 3:1 ratio at the ends to provide wildlife escape ramps, or covered completely to prevent wildlife access, or fully enclosed with desert tortoise-exclusion fencing. All trenches, bores, and other excavations outside the areas permanently fenced with desert tortoise exclusion fencing shall be inspected periodically, but no less than three times, throughout the day and at the end of each workday by the Designated Biologist or a Biological Monitor. Should a tortoise or other wildlife become trapped, the Designated Biologist or Biological Monitor shall remove and relocate the individual as described in the Desert Tortoise Relocation/Translocation Plan. Any wildlife encountered during the course of construction shall be allowed to leave the construction area unharmed.

Avoid Entrapment of Desert Tortoise. Any construction pipe, culvert, or similar structure with a diameter greater than 3 inches, stored less than 8 inches aboveground area) for one or more nights, shall be inspected for tortoises before the material is moved, buried, or capped. As an alternative, all such structures may be capped before being stored outside the fenced area, or placed on pipe racks.

10. Minimize Standing Water. Water applied to dirt roads and construction areas (trenches or spoil piles) for dust abatement shall use the minimal amount needed to meet safety and air quality standards in an effort to prevent the formation of puddles, which could attract desert tortoises and common ravens to construction sites. A Biological Monitor shall patrol these areas to ensure water does not puddle and shall take appropriate action to reduce water application where necessary.

Dispose of Road-killed Animals. Road-killed animals or other carcasses detected on roads near the project area shall be picked up immediately and delivered to the Designated Biologist or Biological Monitor. For special-status species roadkill, the

Biological Monitor shall contact USFWS and CDFG within 1 working day of receipt of the carcass for guidance on disposal or storage of the carcass. The Biological Monitor shall report the special-status species record as described in Conditions of Certification **BIO-2** and **BIO-26.**

Minimize Spills of Hazardous Materials. All vehicles and equipment shall be maintained in proper working condition to minimize the potential for fugitive emissions of motor oil, antifreeze, hydraulic fluid, grease, or other hazardous materials. The Designated Biologist shall be informed of any hazardous spills immediately as directed in the project's Hazardous Materials Plan. Hazardous spills shall be immediately cleaned up and the contaminated soil properly disposed of at a licensed facility. Servicing of construction equipment shall take place only at a designated area. Service/maintenance vehicles shall carry a bucket and pads to absorb leaks or spills.

Worker Guidelines. During construction all trash and food-related waste shall be placed in self-closing containers and removed from the site regularly to prevent overflow. Workers shall not feed wildlife or bring pets to the project site. Except for law enforcement personnel, no workers or visitors to the site shall bring firearms or weapons. Vehicular traffic shall be confined to existing routes of travel to and from the project site, and cross country vehicle and equipment use outside designated work areas shall be prohibited. The speed limit when traveling on dirt access routes within desert tortoise habitat shall not exceed 25 miles per hour.

Implement Erosion Control Measures. Standard erosion control measures shall be implemented for all phases of construction and operation to prevent any sediment run-off from exposed slopes from entering state-jurisdictional streambeds on or off the Project site. Sediment and other flow-restricting materials shall be moved to a location where they shall not be washed back into the streambed. All disturbed soils and roads within the project site shall be stabilized to reduce erosion potential, both during and following construction, except that soil stabilizer use may be limited in portions of roads crossing washes or stream channels consistent with applicable water quality requirements.

15. Monitor Ground-Disturbing Activities Prior to Pre-Construction Site Mobilization. If pre-construction site mobilization requires ground-disturbing activities such as for geotechnical borings or hazardous waste evaluations, a Designated Biologist or Biological Monitor shall be present to monitor any actions that could disturb soil, vegetation, or wildlife.

16. Control and Regulate Fugitive Dust. To reduce the potential for the transmission of fugitive dust the project owner shall implement dust control measures. These shall include:

The project owner shall apply non-toxic soil binders, equivalent or better in efficiencies than the CARB-approved soil binders, to active unpaved roadways, unpaved staging areas, and unpaved parking area(s) throughout construction to reduce fugitive dust emissions.

Water the disturbed areas of the active construction sites at least three times per day and more often if uncontrolled fugitive dust is noted.

Enclose, cover, water twice daily, and/or apply non-toxic soil binders according to manufacturer's specifications to exposed soil piles with a 5 percent or greater silt content.

Establish a vegetative ground cover, consistent with **BIO-10,** or otherwise create stabilized surfaces on all unpaved areas at each of the construction sites within 21 days after active construction operations have ceased, consistent with erosion control measures described above.

e. Increase the frequency of watering, if water is used as a soil binder for disturbed surfaces, or implement other additional fugitive dust mitigation measures, to all active disturbed fugitive dust emission sources when wind speeds (as instantaneous wind gusts) exceed 25 mph.

17. Frac-Out Contingency Plan. A Frac-Out Contingency Plan must be approved by the CPM in consultation with CDFG prior to commencement of construction of the water pipeline for horizontal directional drilling under the BNSF railroad tracks.

Verification: All mitigation measures and their implementation methods shall be included in the BRMIMP and implemented. Implementation of the measures shall be reported in the Monthly Compliance Reports by the Designated Biologist. Within 30 days after completion of project construction, the project owner shall provide to BLM's Wildlife Biologist and the CPM, for review and approval, a written construction termination report identifying how measures have been completed.

COMPLIANCE VERIFICATION

BIO-9 The project owner shall provide Energy Commission staff, BLM, CDFG, and USFWS with reasonable access to the project site and mitigation lands under the control of the project owner and shall otherwise fully cooperate with the Energy Commission's and BLM's efforts to verify the project owner's compliance with, or the effectiveness of, mitigation measures set forth in the conditions of certification. The project owner shall hold harmless the Designated Biologist, the Energy Commission and staff, BLM, and any other agencies with regulatory requirements addressed by the Energy Commission's sole permitting authority for any costs the project owner incurs in complying with the management measures, including stop work

orders issued by the CPM or the Designated Biologist. The Designated Biologist shall do all of the following:

Notification. Notify the CPM, BLM, CDFG, and USFWS at least 14 calendar days before initiating ground-disturbing activities. Immediately notify the CPM, BLM, CDFG, and USFWS in writing if the project owner is not in compliance with any conditions of certification, including but not limited to any actual or anticipated failure to implement mitigation measures within the time periods specified in the conditions of certification. CDFG shall be notified at their Southern Region Headquarters Office, 4949 Viewridge Avenue, San Diego, CA 92123; (858) 467-4201. USFWS shall be notified at their Ventura office at 2493 Portola Road, Suite B, Ventura, CA 93003; (805) 644-1766.

Monitoring During Grading. Remain on site daily while grubbing and grading are taking place to avoid or minimize take of listed species, to check for compliance with all impact avoidance and minimization measures, and to check all exclusion zones to ensure that signs, stakes, and fencing are intact and that human activities are restricted in these protected zones.

3. Fence Monitoring. During construction maintain and check all of the desert tortoise exclusion fences on a weekly basis to ensure the integrity of the fence is maintained. The Designated Biologist shall be present on site to monitor construction and determine fence placement during initial fence installation. During operation of the project, fence inspections shall occur at least once per month throughout the life of the project, and within 24 hours after storms or other events that might affect the integrity and function of desert tortoise exclusion fences. Fence repairs shall occur within two days (48 hours) of detecting problems that affect the functioning of the desert tortoise exclusion fencing. If fence damage occurs during any time of year when tortoises may be active, the project owner shall be responsible for monitoring the site of the damaged fence until it is fully repaired, to prevent a desert tortoise from entering the project area. All incidents of damaged tortoise exclusion fence, including dates of damage and repair; extent of damage; and monitoring summaries (methods and results) shall be reported to the BLM, CPM, CDFG, and USFWS. All wildlife found entrapped or dead in the fence shall be reported to the BLM, CPM, CDFG, and USFWS.

Monthly Compliance Inspections. Conduct compliance inspections at a minimum of once per month after clearing, grubbing, and grading are completed and submit a monthly compliance report to the CPM, BLM, USFWS, and CDFG. All observations of listed species and their sign shall be reported to the Designated Biologist for inclusion in the monthly compliance report.

Annual Listed Species Status Report. No later than January 31 of every year the Project facility remains in operation, provide the CPM, BLM, USFWS, and CDFG

an annual Listed Species Status Report, which shall include, at a minimum: 1) a general description of the status of the project site and construction/operation activities, including actual or projected completion dates, if known; 2) a copy of the table in the BRMIMP with notes showing the current implementation status of each mitigation measure; 3) an assessment of the effectiveness of each completed or partially completed mitigation measure in minimizing and compensating for project impacts, 4) recommendations on how effectiveness of mitigation measures might be improved, and 5) a summary of any agency approved modifications to the BRMIMP.

Final Listed Species Mitigation Report. No later than 45 days after initiation of project operation, provide the CPM a Final Listed Species Mitigation Report that shall include, at a minimum: 1) a copy of the table in the BRM IMP with notes showing when each of the mitigation measures was implemented; 2) all available information about project-related incidental take of listed species; 3) information about other project impacts on the listed species; 4) construction dates; 5) an assessment of the effectiveness of conditions of certification in minimizing and compensating for project impacts; 6) recommendations on how mitigation measures might be changed to more effectively minimize and mitigate the impacts of future projects on the listed species; and 7) any other pertinent information, including the level of take of the listed species associated with the project.

Notification of Injured, Dead, or Relocated Listed Species. In the event of a sighting of an injured, killed, or relocated listed species in an active construction area (e.g., with equipment, vehicles, or workers), ~~injury, kill, or relocation of any listed species,~~ the CPM, BLM, CDFG, and USFWS shall be notified immediately by phone by the Designated Biologist or Biological Monitor. Notification shall occur no later than noon on the business day following the event if it occurs outside normal business hours so that the agencies can determine if further actions are required to protect listed species. Written follow-up notification via FAX or electronic communication shall be submitted to these agencies within five calendar days of the incident and include the following information as relevant:

Injured Desert Tortoise. If a desert tortoise is injured as a result of project-related activities during construction, the Designated Biologist shall immediately take it to a CDFG-approved wildlife rehabilitation and/or veterinarian clinic. Any veterinarian bills for such injured animals shall be paid by the project owner. Following phone notification as required above, the CPM, BLM, CDFG, and USFWS shall determine the final disposition of the injured animal, if it recovers. Written notification shall include, at a minimum, the date, time, location, circumstances of the incident, and the name of the facility where the animal was taken.

Desert Tortoise Fatality. If a desert tortoise is killed by project-related activities during construction or operation, or if a desert tortoise is

otherwise found dead, submit a written report with the same information as an injury report. These desert tortoises shall be salvaged according to guidelines described in Salvaging Injured, Recently Dead, Ill, and Dying Wild, Free-Roaming Desert Tortoise (Berry 2001). The project owner shall pay to have the desert tortoises transported and necropsied. The report shall include the date and time of the finding or incident.

8. Stop Work Order. The CPM/BLM may issue the project owner a written stop work order to suspend any activity related to the construction or operation of the project to prevent or remedy a violation of one or more conditions of certification (including but not limited to failure to comply with reporting, monitoring, or habitat acquisition obligations) or to prevent the illegal take of an endangered, threatened, or candidate species. The project owner shall comply with the stop work order immediately upon receipt thereof.

Verification: No later than two calendar days following the above-required notification of a sighting, kill, injury, or relocation of a listed species, the project owner shall deliver to the CPM, BLM, CDFG, and USFWS via FAX or electronic communication the written report from the Designated Biologist describing all reported incidents of the sighting, injury, kill, or relocation of a listed species, identifying who was notified and explaining when the incidents occurred. In the case of a sighting in an active construction area, the project owner shall, at the same time, submit a map (e.g., using Geographic Information Systems) depicting both the limits of construction and sighting location to the CPM, BLM, CDFG, and USFWS.

No later than January 31st of every year the Calico Solar Project facility remains in operation, provide the CPM and BLM an annual Listed Species Status Report as described above, and a summary of desert tortoise exclusion fence inspections and repairs conducted in the course of the year.

REVEGETATION PLAN AND COMPENSATION FOR IMPACTS TO NATIVE VEGETATION COMMUNITIES

BIO-10 The project owner shall provide restoration/compensation for impacts to native vegetation communities and develop and implement a Revegetation Plan for all areas subject to temporary project disturbance, including but not limited to linear features and berms of detention or debris basins, to the extent permitted by stormwater control requirements. Upon completion of construction, all temporarily disturbed areas shall be restored to pre-project grade and revegetated according to the measures described below. Temporarily disturbed areas within the project area

include, but are not limited to: all areas where underground infrastructure was installed, temporary access roads, construction work temporary lay-down areas, and construction equipment staging areas. For the purpose of this mitigation measure, "temporarily disturbed areas" shall include disturbances that are considered permanent impacts in the analyses above (i.e., would take more than 5 years to recover) but would benefit from the revegetation activities identified here. Areas within the PV Tracker Blocks (unimproved module access points and the native soil rows) shall not be revegetated. The following measures shall be implemented for all temporarily disturbed areas, excluding areas immediately around facilities which may be landscaped according to a separate Landscape Plan. These measures will include:

1. Plan Details. The plans shall include at minimum: (a) locations and details for top soil storage; (b) methods to salvage and replant cacti, yucca or other species described in **BIO-12** Section E, or to plant out nursery stock of these species onto revegetation sites; (c) seed collection guidelines; (d) a schematic depicting the mitigation area; (e) time of year that the planting will occur and the methodology of the planting; (f) a description of the irrigation methodology if used; (g) measures to control exotic vegetation on site; (h) performance standards (see below); and (i) a detailed monitoring program. All ~~habitats~~temporary disturbance areas dominated by non-native species prior to project disturbance shall be revegetated using appropriate native species. This plan shall also contain contingency measures for failed restoration efforts (efforts not meeting success criteria).

Topsoil Salvage. Topsoil shall be stockpiled from the project site for use in revegetation of the temporarily disturbed ~~soils~~areas. The topsoil excavated shall be segregated, kept intact, and protected, under conditions shown to sustain seed bank viability. The upper 1 inch of topsoil which contains the seed bank shall be scraped and stockpiled for use as the top-dressing for the revegetation area. An additional 6 to 8 inches of soil below the top 1 inch of soil shall also be scraped and separately stockpiled for use in revegetation areas. Topsoil shall be replaced in its original vertical orientation following ground disturbance, ensuring the integrity of the top one inch in particular. All other elements of soil stockpiling shall be conducted as described on pages 39-40 of *Rehabilitation of Disturbed Lands in California* (Newton and Claassen 2003).

Seed and Nursery Stock. Only seed or potted nursery stock of locally occurring native species shall be used for revegetation. Seeds shall contain a mix of short-lived early pioneer species such as native annuals

and perennials and subshrubs. Seeding and planting shall be conducted as described in Chapter 5 of *Rehabilitation of Disturbed Lands in California* (Newton and Claassen 2003). A list of plant species suitable for Mojave Desert region revegetation projects, including recommended seed treatments, are included in Appendix A-8 of the same report. The list of plants observed during the 2010 special-status plant surveys of the Project area can also be used as a guide to site-specific plant selection for revegetation. In conformance with BLM policy, the project owner shall include salvaged or nursery stock yucca (all species), cacti (excluding cholla species, genus *Cylindropuntia),* smoke tree, mesquites, and desert ironwood in revegetation plans and implementation, as described in **BIO-12** Section E.

4. Monitoring Requirement and Performance Standards. Post-seeding and planting monitoring will be yearly and shall continue for a period of no less than 10 years or until the defined performance standards are achieved (whichever is later). Remediation activities (e.g., additional planting, removal of non-native invasive species, or erosion control) shall be taken during the 10-year period if necessary to ensure the success of the restoration effort. If the mitigation fails to meet the established performance standards after the 10-year maintenance and monitoring period, monitoring and remedial activities shall extend beyond the 10-year period until the performance standards are met, unless otherwise specified by the Energy Commission and BLM. As needed to achieve performance standards, the project owner shall be responsible for replacement planting or other remedial action as agreed to by BLM and CPM. Replacement plants shall be monitored with the same survival and growth requirements as required for original revegetation plantings. The following performance standards must be met by the end of the monitoring period: (a) at least 80% of the species and vegetative cover observed within the temporarily disturbed areas shall be native species that naturally occur in desert scrub habitats; (b) absolute cover and density of native plant species within the revegetated areas shall equal at least 60% of the pre-disturbance or reference vegetation cover; and (c) the site shall have gone without irrigation or remedial planting for a minimum of three years prior to completion of monitoring.

5. If a fire or flood damages a revegetation area within the 10-year monitoring period, the owner shall be responsible for a one-time replacement. If a second fire or flood occurs, no replanting is required, unless the event is caused by the owner's activity (e.g., as determined by BLM or other firefighting agency investigation).

Verification: All mitigation measures and their implementation methods shall be included in the BRMIMP and implemented. Within 90 days after completion of each year of project construction, the project owner shall provide to the CPM verification of the total vegetation acreage subject to temporary and permanent disturbance. To monitor and evaluate the success of the revegetation, the project owner shall submit annual reports of the revegetation including the status of the site, percent cover of native and exotics, and any remedial actions conducted by the owner to the CPM and BLM Wildlife Biologist.

~~No less than 30 days following the publication of the Energy Commission License Decision or the Record of Decision/ROW Issuance, whichever comes first~~At least 30 days prior to Pre-Construction Site Mobilization, the project owner shall submit to the CPM and BLM's Wildlife Biologist a final agency-approved Revegetation Plan~~ that has been reviewed and approved by BLM's Wildlife Biologist and the CPM~~. The Plan shall include a Plant Salvage and Replacement Section as described in **BIO-12** Section E. All modifications to the Revegetation Plan shall be made only after approval from BLM's Wildlife Biologist and the CPM.

Within 30 days after completion of each year of project construction, the project owner shall provide to the CPM for review and approval, a written report identifying which items of the Revegetation Plan have been completed, a summary of all modifications to mitigation measures made during the project's construction phase, and which items are still outstanding.

On January 31st of each year following construction until the completion of the revegetation monitoring specified in the Revegetation Plan, the Designated Biologist shall provide a report to the CPM and BLM's Wildlife Biologist that includes: a summary of revegetation activities for the year, a discussion of whether revegetation performance standards for the year were met; and recommendations for revegetation remedial action, if warranted, are planned for the upcoming year.

WEED MANAGEMENT PLAN

BIO-11 The project owner shall ~~revise~~prepare and implement a Weed Management Plan that meets the approval of BLM and CPM. The draft ~~Noxious~~ Weed Management Plan submitted by the ~~applicant~~project owner shall provide the basis for the final plan, subject to review and revisions from BLM, USFWS, CDFG, and the CPM.

The final plan shall include weed control measures with demonstrated records of success, based on the best available information from sources such as: The Nature Conservancy's The Global Invasive Species Team, Cooperative Extension, California Invasive Plant Council http://www.cal-ipc.org/ip/ management/plant profiles/index. php, and the California Department

of Food & Agriculture Encycloweedia: http://www.cdfa.ca.gov/phpps/ipc/encycloweedia/encycloweedia hp.htm. The methods shall meet the following criteria:

Manual: well-timed removal of plants or seed heads with hand tools; seed heads and plants must be disposed of in accordance with guidelines from the ~~Riverside~~San Bernardino County Agricultural Commissioner.

Chemical: Herbicides known to have residual toxicity, such as ~~preemergents~~pre-emergents and ~~pelltspellets~~, shall not be used in natural areas or within the engineered channels. Only the following application methods may be used: wick (wiping onto leaves); inner bark injection; cut stump; frill or hack & squirt (into cuts in the trunk); basal bark girdling; foliar spot spraying with backpack sprayers or pump sprayers at low pressure or with a shield attachment to control drift, and only on windless days, or with a squeeze bottle for small infestations.

In addition to describing weed eradication and control methods, and a reporting plan for weed management during and after construction, the final Weed Management Plan shall include ~~at least~~ the following Best Management Practices to prevent the spread and propagation of weeds:

Limit the extent of any vegetation and/or ground disturbance to the absolute minimum needed, and limit ingress and egress to defined routes.

Install and maintain vehicle wash and inspection stations and closely monitor the types of materials brought onto the site.

Reestablish vegetation on disturbed sites with native seed mixes (measures and performance standards to be consistent with Revegetation Plan, described in Condition of Certification **BIO-10).**

Monitoring and timely implementation of control measures to ensure early detection and eradication for weed invasions. Weed infestations must be controlled or eradicated as soon as possible upon discovery, and before they go to seed, to prevent further expansion.

Use only weed-free straw or hay bales used for sediment barrier installations, and weed-free seed.

Reclamation and revegetation shall occur on all temporarily disturbed areas, including, but not limited to, transmission lines, temporary access roads, construction work temporary lay-down areas, and staging areas.

Control weeds in areas where irrigation and panel or mirror washing take place.

Prohibit disposal of mulch or green waste from mown weed infestations ~~around~~within the ~~solar generators~~project area to prevent inadvertent introduction and spread of invasive plants beyond the immediate vicinity of the project area and possibly into Environmentally Sensitive Areas (ESAs) within the project area or rare plant populations off-site. Mulch or green waste shall be removed from the site in a covered vehicle to prevent seed dispersal, and transported to a landfill or composting facility.

Indicate where herbicides may be used, which herbicides, and specify techniques to be used to avoid chemical drift or residual toxicity to special-status plants, consistent with guidelines provided by the Nature Conservancy's The Global Invasive Species Team

(http://www. invasive.org/gist/products. html).

Avoid herbicide use or other control methods in or around ~~Environmentally Sensitive Areas (~~ESAs, (see Condition of Certification **BIO-12)** on-site or off-site; prevent any herbicide drift into ESAs.

From the time construction begins and throughout the life of the project, surveying for new invasive weed populations and the monitoring of identified and treated populations shall be required within the project area and surrounding 250-foot buffer area. See also requirements for weed monitoring and treatment in the adjacent Pisgah Crater ACEC described in Condition of Certification **BIO-12.** Surveying and monitoring for weed infestations shall occur annually. Treatment of all identified weed populations shall occur at a minimum of once annually. When no new seedlings or resprouts are observed at treated sites for three consecutive, average rainfall years, the weed infestation at that site can be considered eradicated and weed control efforts, but not annual monitoring, may cease for that impact site.

Verification: At least 30 days prior to start of any ~~project-related ground disturbance activities~~pre-construction site mobilization, the project owner shall provide the BLM's Wildlife Biologist and the CPM with the ~~revised Weed Management Plan. The project owner shall coordinate with the CPM and BLM's Wildlife Biologist to revise and finalize the~~final Weed Management Plan. Any further modifications to the approved Weed Management Plan shall be made only after consultation with the CPM and BLM's Wildlife Biologist in consultation with USFWS and CDFG. Within 30 days after completion of project construction, the project owner shall provide to the BLM's Wildlife Biologist and the CPM for review and approval, a written report identifying which items of the Weed Management Plan have been completed, a summary of all modifications to mitigation measures made during the project's construction phase, and which items are

still outstanding. A summary report on weed management on the project site shall be submitted in the Annual Compliance Report during plant operations.

SPECIAL-STATUS PLANT IMPACT AVOIDANCE AND MINIMIZATION

BIO-12 This condition contains the following five sections:

Section A: White-margined Beardtongue Avoidance and Minimization Measures describes measures to protect all white-margined beardtongue plants located within the project area or within 250 feet of its boundaries (including access roads, staging areas, laydown areas, parking and storage areas) from accidental and indirect impacts during construction, operation, and closure.

Section B: Conduct Late Season Botanical Surveys ~~describes guidelines for conducting~~confirms that 2010 summer-fall surveys ~~to detect special-status plants that may~~ have been ~~missed during the spring surveys~~completed.

Section C: Mitigation Requirements for Special-Status Plants Detected in the Summer/Fall Surveys outlines the level of avoidance required for plants detected during the 2010 summer-fall surveys, based on the species' rarity and conservation status. Avoidance is based on extent of local occurrences on the project site and, as applicable, extending onto contiguous public land. Where avoidance would result in on-site isolation of plant occurrences from essential ecological processes, or would cause local populations to become ~~inviable~~no longer viable, then off-site compensation would be allowed.

Section D: Off-Site Compensatory Mitigation for Special-Status Plants describes performance standards for mitigation for a range of options for compensatory mitigation through acquisition, restoration/enhancement, or a combination of acquisition and restoration/enhancement, based on the species' rarity and conservation status.

Section E: Plant Salvage describes measures to include potted nursery stock or salvaged specimens of certain cacti, yucca, and other species listed in San Bernardino County plant protection policies in revegetation plans, in conformance with BLM policy.

"Project Disturbance Area" encompasses all areas to be temporarily ~~and~~or permanently disturbed by the Project, including the plant site, linear facilities, and areas disturbed by temporary access roads, fence installation, construction work lay-down and staging areas, parking, storage, or by any other activities resulting in disturbance to soil or vegetation. Nothing in this condition requires the project owner to conduct botanical surveys on private lands adjacent to the project site when the project owner has made reasonable attempts to obtain permission to enter the property for survey work but was unable to obtain such permission.

The Project owner shall implement the following measures in Section A, B, C, D and E to avoid, minimize, and compensate for impacts to certain special-status plant species, based on species rarity and conservation status:

Section A: White-margined Beardtongue Avoidance and Minimization Measures

To protect all white-margined beardtongue plants located within the project area or within 250 feet of its boundaries (including access roads, staging areas, laydown areas, parking and storage areas) from accidental and indirect impacts during construction, operation, and closure, the Project owner shall implement the following measures:

1. Designated Botanist. An experienced botanist who meets the qualifications described in Section **B-2** below shall oversee compliance with all special-status plant avoidance, minimization, and compensation measures described in this condition throughout construction, operation, and closure. The Designated Botanist shall oversee and train all other Biological Monitors tasked with conducting botanical survey and monitoring work.

2. White-margined Beardtongue Impact Avoidance and Minimization Plan. The Project owner shall prepare and implement a White-margined Beardtongue Impact Avoidance and Minimization Plan and shall incorporate the Plan into the BRMIMP (**BIO-7).** The Plan shall be designed to prevent direct or indirect effects of project construction and operation to all white-margined beardtongue occurrences within the project boundary, and to any other special status plants including small-flowered androstephium located within Environmentally Sensitive Areas (defined below). The Plan shall include the following elements:

   Designate Environmentally Sensitive Areas (ESAs). Before construction, designate ESAs to protect all known white-margined beardtongue locations ~~on~~within the project site or within 250 feet of site boundaries. The ESAs shall include, at minimum, the approximately 18 acres of white-margined beardtongue occurrences as identified on Applicant's Exhibit 57, Alternative Site Layout #2. The locations of ESAs shall be clearly depicted on construction drawings, which shall also include all avoidance and minimization measures on the margins of the construction plans. The boundaries of the ESAs shall provide a minimum of 250 feet buffer area between white-margined beardtongue plant locations and any ground-disturbing project activity. The ESAs shall be clearly delineated in the field with permanent fencing and signs prohibiting movement of the fence under penalty of work stoppages and additional compensatory mitigation. ESAs shall also be permanently marked (with signage or other markers) to ensure that avoided plants are not inadvertently harmed during construction, operation, or closure.

Baseline data. Document baseline conditions, including numbers and areal extent of white-margined beardtongue and any other special-status plant occurrences within the ESAs;

Success criteria. Specify success standards for protection of special-status plant occurrences within the ESAs, and identify specific triggers for remedial action (e.g., numbers of plants dropping below a threshold);

Literature review. Describe and reference any available information about microhabitat preferences and fecundity, essential pollinators, reproductive biology, and propagation and culture requirements for white-margined beardtongue and any other special-status species within the ESAs;

Protection and avoidance measures. Describe measures (e.g., fencing, signage) to avoid direct and indirect construction and operation impacts to special-status plants within the ESAs; these shall include but shall not be limited to: (1) training components specific to protection of white-margined beardtongue and surrounding habitat buffer area, which shall be incorporated into the WEAP described in **BIO6;** (2) detailed specifications for avoiding herbicide and soil stabilizer drift, and shall include a list of herbicides and soil stabilizers that may be used on the Project with manufacturer's guidance on appropriate use; the Plan shall reference the Weed Management Plan (see Condition of Certification **BIO-11)** and shall be consistent with provisions of that Plan; (3) measures to ensure that erosion and sediment control do not inadvertently impact special-status plants located within an ESA (e.g., by using invasive or nonnative plants in seed mixes, introducing pest plants through contaminated seed or straw, etc.). Where applicable, these measures shall be incorporated in the Weed Management Plan and Storm Water Pollution Prevention Plan. Also, designate spoil areas; equipment, vehicle, and materials storage areas; parking; equipment and vehicle maintenance areas, and; wash areas at least 100 feet from boundaries of any ESAs;

Monitoring and Reporting Requirements. The Designated Botanist shall conduct weekly monitoring of the ESAs during any construction or decommissioning activities within 100 feet of the ESAs, and quarterly monitoring for the remainder of construction and during operations. For the life of the project, the Project owner shall also conduct annual monitoring of the avoided occurrences within ESAs on-site, and off-site occurrences that are within 250 feet from the project boundary and are located on public lands or on private lands to which the ~~Applicant~~Project owner has access. The project owner shall make reasonable attempts to obtain permission to enter adjacent private property for the purpose of rare plant monitoring (see Verification, below).

Remedial Action Measures. Specify remedial action measures to be implemented if success standards (above) are not met at any time during the life of the project;

Seed Collection. Over the life of the project, the project owner shall collect a small proportion of any available seed produced by white-margined beardtongue plants protected on-site within ESAs on an annual basis until propagation research (below) is complete and seed bank curators agree that sufficient seed has been placed into long-term storage. Seed collection must only be done under permit from the BLM; the project owner shall be responsible for obtaining and complying with applicable permit(s). The collection technique shall follow seed collection and storage guidelines contained in (Wall 2009a; Bainbridge 2007). Collection of seed shall be done by the Rancho Santa Ana Botanic Garden (RSABG) Conservation Program staff or other qualified seed or restoration specialist. The Project owner shall be responsible for all costs associated with seed collection and storage. All seed storage shall occur at RSABG or other qualified research institution and at least 40 percent of the collected seed shall remain in long-term storage at RSABG Seed Conservation Program, San Diego Natural History Museum, or other qualified seed conservation program. In the event that construction schedules or seed production prevent collection within ESAs on-site, the ~~applicant~~project owner must substitute off-site seed collection site as approved by the CPM in consultation with the BLM State Botanist;

Propagation research. The project owner shall be responsible for evaluating potential white-margined beardtongue propagation and reintroduction methods with the objective of developing horticultural techniques suitable for eventual introduction of nursery-grown white-margined beardtongue on-site or off-site as remedial action measures if needed (paragraph g., above); a portion of seed (paragraph h., above) shall be made available for propagation research which may at some time inform contingency propagation efforts on the project site or elsewhere; propagation experimentation shall be funded by the project owner and conducted by a qualified research institution such as Rancho Santa Ana Botanic Garden and the results shall not be subject to a non-disclosure agreement. At minimum, propagation research shall include germination and seedling establishment trials under a variety of soil and humidity conditions reflecting the range of seasonal conditions found in the plant's natural habitat on the project site; plant growth from seedling to nursery stock size; and transplantation methods. These trials shall be conducted in part within growth chambers where temperature and humidity are controlled and in part on the project site or adjacent Pisgah ACEC under natural conditions.

Off-site sand transport monitoring and management. The White-margined Beardtongue Impact Avoidance and Minimization Plan shall include a sand

transport monitoring and management section to document and manage project effects to eastward sand transport to occupied white-margined beardtongue aeolian sand habitat off-site to the east. At minimum, the plan shall include the following elements (1) quantify baseline eastward sand transport from the project area into the adjacent BLM Pisgah Crater ACEC, following methods described by Etyemezian et al. (2010); (2) specify methods and schedule for annual sand transport monitoring throughout the first five years of the project's life; (3) identification of thresholds which would trigger remediation requirements; and (4) development of adaptive management strategies to supplement eastward sand transport into the ACEC if needed. These strategies may include revisions to project fencing design, importing sand from off-site or transporting sand across the project site for further dispersal. No sand transport remediation work would be permitted to cause new land disturbance outside the project area as analyzed in this SSA.

k. Off-site weed monitoring and management. The White-margined Beardtongue Impact Avoidance and Minimization Plan shall include methods and schedule to monitor and manage weed abundance in occupied and suitable white-margined beardtongue habitat to the east. At minimum, the plan shall (1) quantify baseline weed abundance in the portion of the ACEC adjacent BLM Pisgah Crater ACEC, adjacent to and within 500 m of the eastern project boundary, north of the BNSF railroad tracks; (2) weed abundance monitoring schedule and methods to implement throughout that area by collecting and analyzing quantitative weed abundance during every year of average or greater rainfall throughout the life of the project; (3) identify weed abundance thresholds which would trigger remediation requirements; and (4) specify weed control methods to be implemented as needed in occupied and suitable white-margined beardtongue habitat throughout the area described above.

Section B: Conduct Late-Season Botanical Surveys

The Project owner ~~shall conduct~~has conducted late-summer/fall botanical surveys in 2010 for late-season special-status plants ~~as described below:~~.

Section C: Mitigation Requirements for Special-Status Plants Detected in the Summer/Fall Surveys

~~1. Survey Timing. To the extent feasible, surveys shall be timed to detect: a) summer annuals triggered to germinate by the warm, tropical summer storms (which may occur any time between June and October), and b) fall-blooming perennials that respond to the cooler, later season storms that originate in the Pacific northwest (typically beginning in September or October), if identification may require leaves, flowers, or~~

other structures not available during spring surveys previously completed. The survey dates shall be based on plant phenology and the timing of a significant storm (i.e., a 10 mm or greater rain or multiple storm events of sufficient volume to trigger germination, as measured at or within 1 mile of the Project site) if an event is recorded. Surveys for summer annuals shall be timed as needed and feasible to identify target species (below), based upon field visits to reference populations. However, due to the undependable nature and scattered patterns of summer and early fall rainfall, it is possible that no suitable rain event will be documented in the area. Nevertheless, the project own shall be responsible for conducting late-season botanical surveys along washes and other lowland areas on site due to the possibility that rainstorms in the Cady Mountains may go undetected, but may initiate summer or fall blooms. In 2010, summer/fall late season botanical surveys shall be completed throughout the project areas designated as Phases 1a and 1b and throughout washes and drainageways of project areas designated as Phase 2. Additional surveys throughout all of the Phase 2 area shall be completed during 2010 or a subsequent year, but prior to construction of that phase.

2. Surveyor Qualifications and Training. Surveys shall be conducted by a qualified botanist knowledgeable in the complex biology of the local flora, and consistent with CDFG (2009) and BLM (2009) protocols. The botanical survey crew shall be prepared to mobilize quickly to conduct appropriately timed surveys. Each field botanist shall be equipped with a GPS unit and record a complete tracklog; these data shall be compiled and submitted along with the Summer-Fall Survey Botanical Report (described below). Prior to the start of surveys, all crew members shall, at a minimum, visit target species reference sites (where available) and/or review herbarium specimens to confirm detectability and obtain a search image.

3. Target Species. Field surveys shall be designed and scheduled to locate target species, defined as all BLM Sensitive plants, CNPS List 1B or 2 (Nature Serve rank S1 and S2) or proposed List 1B or 2 taxa, and any newly reported or documented taxa. Because the potential for range extensions is unknown, the list of potentially occurring special-status plants shall include all special-status taxa known from comparable habitats in the central portion of the Mojave Desert in California. At a minimum, the list shall include all summer or fall-flowering species identified as potentially occurring on the site in the applicant's spring 2010 botanical survey report (TS 2010i) and by Andre (2010, Intervenor Defenders of Wildlife Rebuttal Testimony). Determination of flowering season shall be based upon field visits to reference populations and data available online from the Consortium of California Herbaria and California Native Plant Society. Target species also shall include taxa with bloom seasons that begin in fall and extend

~~into the early spring as many of these are reported to be easier to detect in fall, following the start of the fall rains.~~

~~4. Survey Coverage. At a minimum, the Applicant shall conduct comprehensive surveys (i.e., 100 percent visual coverage) of the washes, dune swales, and other lowlands within the project site. In the intervening uplands (e.g., bajadas and rock outcrops) surveys shall be conducted to ensure a 25 percent visual coverage. Other special or unique habitats associated with rare plants (such as dunes, washes, and chenopod scrubs) shall also be surveyed at 100 percent visual coverage. Transects shall be "intuitive controlled" (per BLM 2009b) to ensure a focus on habitat most likely to support rare plants (such as desert washes or dunes), rather than on pre-defined, evenly-spaced survey grids.~~

~~5. Documenting Occurrences. If a special-status plant is detected, the full extent of the population onsite shall be recorded using GPS in accordance with BLM survey protocols. Additionally, the extent and density of the occupied habitat within one mile of project boundaries shall be assessed at least qualitatively to facilitate an accurate estimation of the proportion of the occurrence affected by the project. For occurrences that are very dense or very large, the plant numbers may be estimated by simple sampling techniques and the survey report must provide qualitative or quantitative data describing the density and roughly mapping the extent on a topographic map. All but the smallest populations (e.g., a population occupying less than 100 square feet) shall be recorded as area polygons; small populations may be recorded as point features. All GPS-recorded occurrences shall include: the number of plants, phenology, observed threats (e.g., OHV or invasive exotics), and habitat or community type. The map of occurrences, to be submitted with the final botanical report, shall be prepared to ensure consistency with mapping protocol and definitions of occurrences in CNDDB: occurrences found within 0.25 miles of another occurrence of the same taxon, and not separated by significant habitat discontinuities, shall be combined into a single 'occurrence.' The Project Owner shall also submit the raw GPS shape files and metadata, and completed CNDDB forms to CNDDB for each occurrence as defined by CNDDB.~~

~~6. Reporting. Raw GPS data, metadata, and CNDDB field forms shall be provided to the CPM within two weeks of completion of each survey. If field surveys take place during two or more phases (e.g., late summer and fall), then a summary letter shall be submitted following each survey.~~

~~The Final Summer-Fall Botanical Survey Report shall be prepared consistent with CDFG guidelines (CDFG 2009), and BLM guidelines (2009) and shall include the following components:~~

~~a. the BLM designation, NatureServe Global and State Rank of each species or taxon found (or proposed rank, or CNPS List);~~

~~b. the number or percent of the occurrence that will be directly affected, and indirectly affected by changes in drainage patterns or altered geomorphic processes;~~

~~c. the habitat or plant community that supports the occurrence and the total acres of that habitat or community type that occurs in the Project Disturbance Area;~~

~~d. an indication of whether the occurrence has any local or regional significance (e.g., if it exhibits any unusual morphology, occurs at the periphery of its range in California, represents a significant range extension or disjunct occurrence, or occurs in an atypical habitat or substrate);~~

~~e. a completed CNDDB field form for every occurrence (i.e., the summed locations of a given species within 0.25 mile distance of another location, consistent with CNDDB methodology), and;~~

~~f. two maps: one that depicts the raw GPS data (as collected in the field) on a topographic base map with Project features; and a second map that follows the CNDDB protocol for occurrence mapping, which lumps two or more occurrences of the same species within one-quarter mile or less of each other into one occurrence.~~

~~Section C: Mitigation Requirements for Special-Status Plants Detected in the Summer/Fall Surveys~~

The Project owner shall apply the following avoidance standards to special-status plants ~~that might be~~ detected during late 2010 summer/fall season surveys. Avoidance and/or the mitigation measures described in Section D below would reduce impacts to special-status plant species to less than significant levels.

Mitigation for CNDDB Rank S1 and S2 Plants: If species with a CNDDB rank of S1 (CDFG 2010b), excluding small-flowered androstephium (CNDDB S1.2), are detected within the Project Disturbance Area or would be directly impacted by discharges from or the diversion of streams around the Project, the Project owner shall implement avoidance measures to protect at least 75 percent of the local occurrence(s) of the species. For perennial species, the local occurrence(s) shall be measured by the number of individual plants located on the Project site or on public lands contiguous to the project site. For annual species, the occurrence(s) shall be measured as areal extent of contiguous occupied habitat on the site and on contiguous public lands. Avoidance shall include protection of the ecosystem processes

essential for maintenance of the protected plant occurrence. Plants located within the ESAs established pursuant to Section A above shall be considered to be "avoided" to the extent that direct impacts on the plants are avoided and that these processes would be maintained. If special status plant occurrences are isolated by the Project from natural fluvial, aeolian, or other processes known to be necessary for their persistence or reproduction, these occurrences shall not be considered "avoided." This evaluation shall be made in consultation among the project Botanist and the CPM, in consultation with CDFG and BLM, on a case by case basis, dependent on the species and its location on the site. The Project owner shall provide compensatory mitigation as described below in Section D for Project impacts to CNDDB Rank S1 and S2 plants that are not avoided. If, after consultation among the project Botanist, CPM, CDFG, and BLM, on-site avoidance is determined not to satisfy the long-term viability of the plant occurrence(s), then compensatory mitigation may be substituted for avoidance for up to 100% of impacts to Rank S1 and S2 plants on the site, as described below in Section D.

Mitigation for CNDDB Rank S3 Plants: If species with a CNDDB rank of 3 are detected within the Project Disturbance Area, no onsite avoidance or compensatory mitigation shall be required unless the occurrence has local or regional significance, in which case the plant occurrence shall be treated as a CNDDB 2 ranked plant. A plant occurrence would be considered to have local or regional significance if:

It occurs at the outermost periphery of its range in California;

It occurs in an atypical habitat, region, or elevation for the taxon that suggests that the occurrence may have genetic significance (e.g., that may increase its ability to survive future threats), or;

c. It exhibits any unusual morphology that is not clearly attributable to environmental factors that may indicate a potential new variety or sub-species.

Should CNDDB Rank S3 plant locations meeting any of the three criteria above be found on the project site during summer or fall field surveys, then mitigation requirements for those species shall be as described above for CNDDB Rank S1 and S2 species.

Pre-Construction Notification for State- or Federal-Listed Species, or BLM Sensitive Species. If a state or federal-listed species or BLM Sensitive species is detected, the Project owner shall immediately notify the CDFG, USFWS, BLM, and the CPM.

Preservation of the Germplasm of Affected Special-Status Plants. For all impacts to CNPS List 1 or List 2 plants, excluding small-flowered

androstephium, mitigation shall include seed collection from the affected special-status plants on-site prior to construction to conserve the germplasm and provide a seed source for restoration efforts. Where construction schedules or seed availability prevents seed collection from plant locations to be impacted during a given season, seed must be collected from another portion of the project site or, as approved by the CPM in consultation with BLM's State Botanist, from public lands off-site. Seed collection must only be done under permit from the BLM; the project owner shall be responsible for obtaining and complying with applicable permit(s). The seed shall be collected under the supervision or guidance of a reputable seed storage facility such as the Rancho Santa Ana Botanical Garden Seed Conservation Program, San Diego Natural History Museum, or the Missouri Botanical Garden. The costs associated with the long-term storage of the seed shall be the responsibility of the Project owner. Any efforts to propagate and reintroduce special-status plants from seeds in the wild shall be carried out under the direct supervision of specialists such as those listed above and as part of a Habitat Restoration/Enhancement Plan approved by the CPM.

Section D: Off-Site Compensatory Mitigation for Special-Status Plants

Where compensatory mitigation is required under the terms of Section C, above, the Project owner shall mitigate Project impacts to CNPS List 1 or List 2 plants, excluding small-flowered androstephium with compensatory mitigation. Compensatory mitigation shall consist of acquisition of habitat supporting the target species, restoration/enhancement of populations of the target species, or a combination of acquisition and restoration/enhancement as provided within this Condition. Compensatory mitigation shall be at a 3:1 ratio. For annual species, compensation shall provide three acres of habitat acquired or restored/enhanced for every acre of special-status plant habitat disturbed by the Project Disturbance Area. For perennial species, compensation lands shall supporting three living plants of the same species for each plant disturbed within the project area. The Project owner shall provide funding for the acquisition and/or restoration/enhancement, initial improvement, and long-term maintenance and management of the acquired or restored lands. The actual costs to comply with this condition will vary

depending on the Project Disturbance Area, the actual costs of acquiring compensation habitat, the actual costs of initially improving the habitat, the actual costs of long-term management as determined by a Property Analysis Record (PAR) or PAR-like analysis, and other transactional costs related to the use of compensatory mitigation.

The Project owner shall comply with other related requirements in this condition:

I. Compensatory Mitigation by Acquisition: The requirements for the acquisition, initial protection and habitat improvement, and long-term maintenance and management of special-status plant compensation lands include all of the following:

Selection Criteria for Acquisition Lands. The compensation lands selected for acquisition may include any of the following three categories:

Occupied Habitat, No Habitat Threats: The compensation lands selected for acquisition shall be occupied by the target plant species and shall be characterized by site integrity and habitat quality that are required to support the target species, and shall be of equal or better habitat quality than that of the affected occurrence.

Occupied Habitat, Habitat Threats. Occupied compensation lands characterized by habitat threats may also be acquired as long as the population could be reasonably expected to recover with minor restoration (e.g., OHV or grazing exclusion, pest plant removal) and is accompanied by a Habitat Enhancement/Restoration Plan as described in Section D.II, below.

3. Unoccupied but Adjacent. The Project owner may also acquire habitat for which occupancy by the target species has not been documented, if the proposed acquisition lands are adjacent to occupied habitat. The Project owner shall provide evidence that acquisitions of such unoccupied lands would improve the defensibility and long-term sustainability of the occupied habitat by providing a protective buffer around the occurrence and by enhancing connectivity with undisturbed habitat.

Review and Approval of Compensation Lands Prior to Acquisition. The Project owner shall submit a formal acquisition proposal to the CPM describing the parcel(s) intended for purchase. This acquisition proposal shall discuss the suitability of the proposed parcel(s) as compensation lands for special-status plants in relation to the criteria listed above, and must be approved by the CPM. Management Plan. The Project owner or approved third party shall prepare a management plan for the compensation lands in consultation with the entity that will be managing the lands. The goal of the management plan shall be to support and enhance the long-term viability of the target special-status plant occurrences. The Management Plan shall be submitted for review and approval to the CPM.

Integrating Special-Status Plant Mitigation with Other Mitigation lands. If all or any portion of the acquired Desert Tortoise, Waters of the State, or other required compensation lands meets the criteria above for special-status plant compensation lands, the portion of the other species' or habitat compensation lands that meets any of the criteria above may be used to fulfill that portion of the obligation for special-status plant mitigation.

Compensation Lands Acquisition Requirements. The Project owner shall comply with the following requirements relating to acquisition of the compensation lands after the CPM, has approved the proposed compensation lands:

Preliminary Report. The Project owner, or an approved third party, shall provide a recent preliminary title report, initial hazardous materials survey report, biological analysis, and other necessary or requested documents for the proposed compensation land to the CPM. All documents conveying or conserving compensation lands and all conditions of title are subject to review and approval by the CPM. For conveyances to the State, approval may also be required from the California Department of General Services, the Fish and Game Commission and the Wildlife Conservation Board.

Title/Conveyance. The Project owner shall acquire and transfer fee title to the compensation lands, a conservation easement over the lands, or both fee title and conservation easement, as required by the CPM. Any transfer of a conservation easement or fee title must be to CDFG, a non-profit organization qualified to hold title to and manage compensation lands (pursuant to California Government Code section 65965), or to BLM or other public agency approved by the CPM. If an approved non-profit organization holds fee title to the compensation lands, a conservation easement shall be recorded in favor of CDFG or another entity approved by the CPM. If an entity other than CDFG holds a conservation easement over the compensation lands, the CPM may require that CDFG or another entity approved by the CPM, in consultation with CDFG, be named a third party beneficiary of the conservation easement. The Project owner shall obtain approval of the CPM of the terms of any transfer of fee title or conservation easement to the compensation lands.

Initial Protection and Habitat Improvement. The Project owner shall fund activities that the CPM requires for the initial protection and habitat improvement of the compensation lands. These activities will vary depending on the condition and location of the land acquired, but may include trash removal, construction and repair of fences, invasive plant removal, and similar measures to protect habitat and improve habitat quality on the compensation lands. The costs of these activities are estimated to be $750 per acre ($250 per acre, using the estimated cost per acre for Desert Tortoise mitigation as a best available proxy,

at a 3:1 ratio, but actual costs will vary depending on the measures that are required for the compensation lands). A non-profit organization, CDFG or another public agency may hold and expend the habitat improvement funds if it is qualified to manage the compensation lands (pursuant to California Government Code section 65965), if it meets the approval of the CPM in consultation with CDFG, and if it is authorized to participate in implementing the required activities on the compensation lands. If CDFG takes fee title to the compensation lands, the habitat improvement fund must be paid to CDFG or its designee.

Property Analysis Record. Upon identification of the compensation lands, the Project owner shall conduct a Property Analysis Record (PAR) or PAR-like analysis to establish the appropriate amount of the long-term maintenance and management fund to pay the in-perpetuity management of the compensation lands. The PAR or PAR-like analysis must be approved by the CPM before it can be used to establish funding levels or management activities for the compensation lands.

e. Long-term Maintenance and Management Funding. The Project owner shall provide money to establish an account with long-term maintenance and management. that will be used to fund the long-term maintenance and management of the compensation lands. The amount of money to be paid will be determined through an approved PAR or PAR-like analysis conducted for the compensation lands. Until an approved PAR or PAR-like analysis is conducted for the compensation lands, the amount of required funding is initially estimated to be $4,350 for every acre of compensation lands, using as the best available proxy the estimated cost of $1,450 per acre for Desert Tortoise compensatory mitigation, at a 3:1 ratio. This amount may be revised by the CPM in consultation with DFG, BLM and USFWS, based on further analysis of long-term management and maintenance costs. If compensation lands will not be identified and a PAR or PAR-like analysis completed within the time period specified for this payment (see the verification section at the end of this condition), the Project owner shall either: (i) provide initial payment equal to the amount of $4,350 multiplied by the number of acres the Project owner proposes to acquire for compensatory mitigation; or (ii) provide security to the Energy Commission under subsection (g), “Mitigation Security,” below, in an amount equal to $4,350 multiplied by the number of acres the Project owner proposes to acquire for compensatory mitigation. The amount of the required initial payment or security for this item shall be adjusted for any change in the Project Disturbance Area as described above. If an initial payment is made based on the estimated per-acre costs, the Project

owner shall deposit additional money as may be needed to provide the full amount of long-term maintenance and management funding indicated by a PAR or PAR-like analysis, once the analysis is completed and approved. If the approved analysis indicates less than $4,350 per acquired acre (at a 3:1 ratio) will be required for longterm maintenance and management, the excess paid will be returned to the Project owner. The Project owner must obtain the CPM's approval of the entity that will receive and hold the long-term maintenance and management fund for the compensation lands. The CPM will consult with CDFG before deciding whether to approve an entity to hold the Project's long-term maintenance and management funds.

The Project owner shall ensure that an agreement is in place with the long-term maintenance and management fund holder/manager to ensure the following requirements are met:

i. Interest. Interest generated from the initial capital long-term maintenance and management fund shall be available for reinvestment into the principal and for the long-term operation, management, and protection of the approved compensation lands, including reasonable administrative overhead, biological monitoring, improvements to carrying capacity, law enforcement measures, and any other action that is approved by the CPM and is designed to protect or improve the habitat values of the compensation lands.

Withdrawal of Principal. The long-term maintenance and management fund principal shall not be drawn upon unless such withdrawal is deemed necessary by the CPM or by the approved third-party long-term maintenance and management fund manager, to ensure the continued viability of the species on the compensation lands.

Pooling Long-Term Maintenance and Management Funds. An entity approved to hold long-term maintenance and management funds for the Project may pool those funds with similar non-wasting funds that it holds from other projects for long-term maintenance and management of compensation lands for special-status plants. However, for reporting purposes, the long-term maintenance and management funds for this Project must be tracked and reported individually to the CPM.

Other Expenses. In addition to the costs listed above, the Project owner shall be responsible for all other costs related to acquisition of compensation lands and conservation easements, including but not limited to the title and document review costs incurred from other state agency reviews, overhead related to providing compensation lands to CDFG or an approved third party, escrow fees or costs, environmental contaminants clearance, and other site cleanup measures.

Mitigation Security. The Project owner shall provide financial assurances to the CPM to guarantee that an adequate level of funding is available to implement any of the mitigation measures required by this condition that are not completed prior to the start of ground-disturbing Project activities. Financial assurances shall be provided to the CPM in the form of an irrevocable letter of credit, a pledged savings account or another form of security ("Security") approved by the CPM. The amount of the Security shall be based upon staff's estimate of per-acre acquisition, transaction, and management costs as described in Condition of Certification **BIO-17** for each acre of occupied habitat impacted using the estimated cost per acre for Desert Tortoise mitigation as a best available proxy, at a 3:1 ratio; see **Revised Biological Resources Tables 5** and **7)** for every acre of habitat supporting the target special-status plant species which is significantly impacted by the project. The actual costs to comply with this condition will vary depending on the actual costs of acquiring compensation habitat, the costs of initially improving the habitat, and the actual costs of long-term management as determined by a PAR or PAR-like analysis. Prior to submitting the Security to the CPM, the Project owner shall obtain the CPM's approval of the form of the Security. The CPM may draw on the Security if the CPM determines the Project owner has failed to comply with the requirements specified in this condition. The CPM may use money from the Security solely for implementation of the requirements of this condition. The CPM's use of the Security to implement measures in this condition may not fully satisfy the Project owner's obligations under this condition, and the Project owner remains responsible for satisfying the obligations under this condition if the Security is insufficient. The unused Security shall be returned to the Project owner in whole or in part upon successful completion of the associated requirements in this condition.

h. The Project owner may elect to comply with the requirements in this condition for acquisition of compensation lands, initial protection and habitat improvement on the compensation lands, or long-term maintenance and management of the compensation lands by funding, or any combination of these three requirements, by providing funds to implement those measures into the Renewable Energy Action Team (REAT) Account established with the National Fish and Wildlife Foundation (NFWF). To use this option, the Project owner must make an initial deposit to the REAT Account in an amount equal to the estimated costs (as set forth in the Security section of this condition) of implementing the requirement. If the actual cost of the acquisition, initial protection and habitat improvements, or long-term funding is more than the estimated amount initially paid by the Project owner, the Project owner shall make an additional deposit into the REAT Account sufficient to cover the actual acquisition costs, the actual costs of initial protection and habitat improvement on the compensation lands, and the long-term funding requirements as established in an approved PAR or PAR-like analysis. If those actual costs or PAR projections are less than the amount initially transferred by the ~~applicant~~project owner, the remaining balance shall be returned to the Project owner.

i. The responsibility for acquisition of compensation lands may be delegated to a third party other than NFWF, such as a non-governmental organization supportive of desert habitat conservation, by written agreement of the Energy Commission. Such delegation shall be subject to approval by the CPM, in consultation with CDFG, BLM and USFWS, prior to land acquisition, enhancement or management activities. Agreements to delegate land acquisition to an approved third party, or to manage compensation lands, shall be executed and implemented within 18 months of the Energy Commission's certification of the Project.

II. Compensatory Mitigation by Habitat Enhancement/Restoration: As an alternative or adjunct to land acquisition for compensatory mitigation the Project owner may undertake habitat enhancement or restoration for the target special-status plant species. Habitat enhancement or restoration activities must achieve protection at a 3:1 ratio as described above, with improvements applied to three acres of habitat for every acre of special-status plant habitat directly or indirectly disturbed by the Project Disturbance Area for annual species; or to habitat supporting three living plants for each individual perennial plant directly or indirectly disturbed by the project. Examples of suitable enhancement projects include but are not limited to the following: i) control unauthorized vehicle use into an occurrence (or pedestrian use if clearly damaging to the species); ii) control noxious weeds that infest or pose an immediate threat to an occurrence; iii) exclude grazing by wild burros or livestock from an occurrence; or iv) restore lost or degraded hydrologic or geomorphic functions critical to the species by restoring previously diverted flows, removing obstructions to the wind sand transport corridor above an occurrence, or increasing groundwater availability for dependent species.

If the Project owner elects to undertake a habitat enhancement project for mitigation, the project must meet the following performance standards: The proposed enhancement project shall achieve rescue of an off-site occurrence that is currently assessed, based on the NatureServe threat ranking system (Master et al. 2009; Morse et al. 2004) with one of the following threat ranks: a) long-term decline 30 percent; b) an immediate threat that affects 30 percent of the population, or c) has an overall threat impact that is High to Very High. "Rescue" would be considered successful if it achieves an improvement in the occurrence trend to "stable" or "increasing" status, or downgrading of the overall threat rank to slight or low (from "High" to "Very High").

If the Project owner elects to undertake a habitat enhancement project for mitigation, they shall submit a Habitat Enhancement/Restoration Plan to the CPM for review and approval, and shall provide sufficient funding for implementation and monitoring of the Plan. The amount of the Security shall be based upon staff's estimate of per-acre acquisition, transaction, and management costs as described in Condition of

Certification **BIO-17** for each acre of occupied habitat impacted by the project, using the estimated cost per acre for Desert Tortoise mitigation as a best available proxy, at a 3:1 ratio (see **Revised Biological Resources Tables 5** and **7).** The amount of the security may be adjusted based on the actual costs of implementing the enhancement, restoration and monitoring. The implementation and monitoring of the enhancement/restoration may be undertaken by an appropriate third party such as NFWF, subject to approval by the CPM. The Habitat Enhancement/Restoration Plan shall include each of the following:

Goals and Objectives. Define the goals of the restoration or enhancement project and a measurable course of action developed to achieve those goals. The objective of the proposed habitat enhancement plan shall include restoration of a target special-status plant occurrence that is currently threatened with a long-term decline. The proposed enhancement plan shall achieve an improvement in the occurrence trend to "stable" or "increasing" status, or downgrading of the overall threat rank to slight or low (from "High" to "Very High").

Historical Conditions. Provide a description of the pre-impact or historical conditions (before the site was degraded by weeds or grazing or ORV, etc.), and the desired conditions.

Site Characteristics. Describe other site characteristics relevant to the restoration or enhancement project (e.g., composition of native and pest plants, topography and drainage patterns, soil types, geomorphic and hydrologic processes important to the site or species.

Ecological Factors. Describe other important ecological factors of the species being protected, restored, or enhanced such as total population, reproduction, distribution, pollinators, etc.

Methods. Describe the restoration methods that will be used (e.g., invasive exotics control, site protection, seedling protection, propagation techniques, etc.) and the long-term maintenance required. The implementation phase of the enhancement must be completed within five years.

Budget. Provide a detailed budget and timeline; develop clear, measurable, objective-driven annual success criteria.

Monitoring. Develop clear, measurable monitoring methods that can be used to evaluate the effectiveness of the restoration and the benefit to the affected species. The Plan shall include a minimum of five years of quarterly monitoring, and then annual monitoring for the remainder of the enhancement project, or until the performance standards for rescue of a threatened occurrence are met, whichever comes first. At a minimum the progress reports shall include: quantitative measurements of the projects progress in meeting the enhancement project success criteria, detailed description of remedial actions taken or proposed, and contact information for the responsible parties.

Reporting Program. The Plan shall ensure accountability with a reporting program that includes progress toward goals and success criteria. Include names of responsible parties.

9. Contingency Plan. Describe the contingency plan for failure to meet annual goals.

10. Long-term Protection. Include proof of long-term protection for the restoration site. For private lands this would include conservations easements or other deed restrictions; projects on public lands must be contained in a Desert Wildlife Management Area, Wildlife Habitat Management Area, or other land use protections that will protect the mitigation site and target species.

Section E: Conformance with BLM and San Bernardino County Plant Protection Policies

It is BLM policy to salvage yucca and cactus plants (excluding cholla species, genus *Cylindropuntia)* and transplant them to undisturbed sites within project Rights of Way. The San Bernardino County Plant Protection and Management Ordinance regulates the following where they occur on non-government land (San Bernardino County Code 88.01): desert native plants with stems 2 inches or greater in diameter or 6 feet or greater in height: *Psorothamnus* [*Dalea] spinosa* (smoke tree), *Prosopis* spp. (mesquites), all species of the family Agavaceae (century plants, nolinas, yuccas), creosote rings 10 feet or greater in diameter, all Joshua trees; and any part of any of the following species, whether living or dead: *Olneya tesota* (desert ironwood), all species of the genus *Prosopis* (mesquites), and all species of the genus *Cercidium* (palo verdes). Staff recognizes that the project site is on public land and thus not strictly subject to the County ordinance but believes the County ordinance establishes an additional mitigation standard that should be applied to the project, as follows:

The project owner shall inventory all plants subject to BLM and County policies on the project site that would be removed or damaged by proposed project construction.

The project owner shall include salvaged plants or potted nursery stock of any species named in BLM or County policies in on-site revegetation planning and implementation, as described in **BIO-10.** The project owner shall include a Protected Plant Salvage and Replacement Section in the Revegetation Plan, in conformance with BLM. The Section also shall provide for incorporation of salvaged or potted stock of any species identified in the San Bernardino County standards that would be impacted by project development affected. The Section shall be made available for review and approval by the CPM. For salvaged plants, the Section shall include detailed descriptions of proposed methods to salvage plants; transport them; store them temporarily (as needed); and maintain them in temporary

storage (i.e., irrigation, shade protection, etc.). For both salvaged plants and potted nursery stock, the Section shall include detailed descriptions of proposed planting locations and methods; proposed irrigation and maintenance methods at planting sites; and a monitoring plan to verify survivorship and establishment of the plants for a minimum of five years.

c. Concurrent with any ground-disturbing activities within any phase of the project, the project owner shall implement the Protected Plant Replacement measures as approved by the CPM and BLM's State Botanist.

Verification: The Special-Status Plant Impact Avoidance and Minimization Measures shall be incorporated into the BRMIMP as required under Condition of Certification **BIO-7.**

Implementation of the special-status plant impact avoidance and minimization measures shall be reported in the Monthly Compliance Reports prepared by the Designated Botanist. Within 30 days after completion of Project construction, the Project owner shall provide to the CPM, for review and approval in consultation with the BLM State Botanist, a written construction termination report identifying how measures have been completed.

The Project owner shall submit a monitoring report every year for the life of the project to monitor effectiveness of protection measures for all avoided special-status plants to the CPM and BLM State Botanist. The monitoring report shall include: dates of worker awareness training sessions and attendees, an inventory of the special-status plant occurrences and description of the habitat conditions, an indication of population and habitat quality trends, and description of the remedial action, if warranted and planned for the upcoming year.

Section A. No less than 30 days prior to the start of ~~ground-disturbing activities~~Pre-Construction Site Mobilization, the Project owner shall submit grading plans and construction drawings depicting the location of Environmentally Sensitive Areas and the Avoidance and Minimization Measures contained in Section A of this Condition. The project owner shall coordinate with the CPM and BLM's ~~Wildlife Biologist~~Botanist to revise and finalize boundaries of the ESAs. The 30 day limit may be reduced by the CPM.

No less than 30 days prior to the start of ~~ground-disturbing activities~~Pre-Construction Site Mobilization the Project owner shall submit to the CPM for review and approval, in consultation with the BLM ~~State~~ Botanist, the name and resume of the project's Designated Botanist. If a Designated Botanist needs to be replaced, the specified information of the proposed replacement must be submitted to BLM's ~~Wildlife Biologist~~Botanist and the CPM as soon as possible prior to the termination or release

of the Designated ~~Biologist~~Botanist. In an emergency, the project owner shall immediately notify the BLM's ~~Wildlife Biologist~~Botanist and the CPM to discuss the qualifications and approval of a short-term replacement while a permanent Designated Botanist is proposed to BLM's ~~Wildlife Biologist~~Botanist and the CPM and for consideration. The 30 day limit may be reduced by the CPM.

No less than 30 days prior to ~~ground-disturbing activities~~start of Pre-Construction Site Mobilization the Project owner shall submit a draft White-margined Beardtongue Impact Avoidance and Minimization Plan to the CPM for review and approval, in consultation with the BLM ~~State~~ Botanist. Implementation of the white-margined beardtongue impact avoidance and minimization measures shall be reported in the Monthly Compliance Reports prepared by the Designated Botanist. Within 30 days after completion of Project construction, the Project owner shall provide to the CPM, for review and approval in consultation with the BLM ~~State~~ Botanist, a written construction termination report identifying how measures have been completed. The 30 day limit may be reduced by the CPM.

The Project owner shall submit a monitoring report every year for the life of the project to monitor effectiveness of protection measures for all avoided white-margined beardtongue ESAs to the CPM and BLM ~~State~~ Botanist. The monitoring report shall include: dates of worker awareness training sessions and attendees, an inventory of the special-status plant occurrences and description of the habitat conditions, an indication of population and habitat quality trends, and description of the remedial action, if warranted and planned for the upcoming year. The project owner shall coordinate with the CPM and BLM's ~~Wildlife Biologist~~Botanist to revise and finalize monitoring reports and all reports described in this section, and shall specifically report any difficulties in meeting the protection goals and cooperatively develop adaptive measures as needed.

Section B. ~~Raw GPS data, metadata, and CNDDB field forms shall be submitted to the CPM within two weeks of the completion of each survey. A preliminary summary of results for the late summer/fall botanical surveys shall also be submitted to the CPM and BLM's State Botanist within two weeks following the completion of the surveys. If surveys are split into more than one period, then a summary letter shall be submitted following each survey period. The Final Summer-Fall Botanical Survey Report, GIS shape files and metadata shall be submitted to the BLM State Botanist and the CPM no less than 30 days prior to the start of ground-disturbing activities. The Final Report shall include a detailed accounting of the acreage of Project impacts to special-status plant occurrences.~~

Section C. The Project owner shall immediately provide written notification to the CPM, CDFG, USFWS, and BLM if it detects a State- or Federal-Listed Species, or BLM Sensitive Species at any time during its late summer/fall botanical surveys or at any time thereafter through the life of the Project, including conclusion of Project decommissioning.

Prior to ~~construction~~disturbance of special status plants, the project owner shall provide written verification that seed of any special status plants on the project site ~~have~~has been collected and conveyed to a facility (as described in this measure) and that suitable long-term funding has been provided by the project owner. As needed, the project owner shall consult with the CPM and BLM's ~~State~~ Botanist to identify appropriate seed collection sites and dates.

Section D. If compensatory mitigation is required (based upon field survey results and mitigation strategy adopted by the project owner, as described in Sections C and D), no less than 30 days prior to the start of ~~ground-disturbing activities~~each phase of Pre-Construction Site Mobilization, the Project owner shall submit to the CPM Security adequate to acquire compensatory mitigation lands and/or undertake habitat enhancement or restoration activities for such phase, as described in this condition. The 30 day limit may be reduced by the CPM.

No fewer than 90 days prior to acquisition of any compensatory mitigation lands, the Project owner shall submit a formal acquisition proposal and draft Management Plan for the proposed lands to the CPM, with copies to CDFG, USFWS, and BLM, describing the parcels intended for purchase and shall obtain approval from the CPM prior to the acquisition. No fewer than 90 days prior to any acquisition of compensatory mitigation lands, the Project owner shall submit to the CPM and obtain CPM approval of any agreements to delegate land acquisition to an approved third party, or to manage compensation lands; such agreement shall be executed and implemented within 18 months of the ~~Energy Commission's certification of the Project~~start of Pre-Construction Site Mobilization.

The Project owner or an approved third party shall complete the acquisition and all required transfers of the compensation lands, and provide written verification to the CPM of such completion no later than 18 months after the start of ~~Project ground-disturbing activities~~Pre-Construction Site Mobilization. If NFWF or another approved third party is being used for the acquisition, the Project owner shall ensure that funds needed to accomplish the acquisition are transferred in timely manner to facilitate the planned acquisition and to ensure the land can be acquired and transferred prior to the 18-month deadline. If habitat enhancement is proposed, no later than six months following the start of ground-disturbing activities, the Project owner shall obtain CPM approval of the final Habitat Enhancement/Restoration Plan, prepared in accordance

with Section D, and submit to the CPM or a third party approved by the CPM Security adequate for long-term implementation and monitoring of the Habitat Enhancement/Restoration Plan.

Enhancement/restoration activities shall be initiated no later than 12 months from the start of ~~construction~~Pre-Construction Site Mobilization. The implementation phase of the enhancement project shall be completed within five years of initiation. Until completion of the five-year implementation portion of the enhancement action, a report shall be prepared and submitted as part of the Annual Compliance Report. This report shall provide, at a minimum: a summary of activities for the preceding year and a summary of activities for the following year; quantitative measurements of the Project's progress in meeting the enhancement project success criteria; detailed description of remedial actions taken or proposed; and contact information for the responsible parties.

Within 18 months of ~~ground-disturbing activities~~the start of Pre-Construction Site Mobilization, the Project owner shall transfer to the CPM or an approved third party the difference between the Security paid and the actual costs of (1) acquiring compensatory mitigation lands, completing initial protection and habitat improvement , and funding the long-term maintenance and management of compensatory mitigation lands; and/or (2) implementing and providing for the long-term protection and monitoring of habitat enhancement or restoration activities.

Section E. The project owner shall coordinate with the CPM and BLM's ~~Wildlife Biologist~~Botanist to revise and finalize all plans and reports named in this section. Verification and reporting shall be as described in **BIO-10** and shall be included in reports described therein. Within 90 days after ~~completion of each year of project construction~~the anniversary of the start of Pre-Construction Site Mobilization, the project owner shall provide to the CPM verification of the numbers or acreage of plants covered in this Condition (i.e., species named in BLM and County policies) which have been removed or salvaged over the course of the year. Annual revegetation reports described in **BIO-10** verification shall include summaries of salvage and planting operations and monitoring results. Compliance reports shall include summaries of written and photographic records of the plan implementation described above. Compliance reports shall be submitted annually for a period not less than 5 years to document irrigation, maintenance, and monitoring results, including plant survival.

MOJAVE FRINGE-TOED LIZARD MITIGATION

BIO-13 The project owner shall provide compensatory land to mitigate for habitat loss and direct impacts to Mojave fringe-toed lizards based on revised estimates of suitable Mojave fringe-toed lizard habitat on-site, to be verified by an expert in this animal's ecology. The project owner shall provide compensatory mitigation at a 3:1 ratio for impacts to breeding habitat (i.e.,

dune, sand ramp, or fine-sandy wash habitat), and at a 1:1 ratio for impacts to adjacent suitable foraging and cover habitat, such as thin aeolian sand overlying bajada surfaces, or foraging habitat surrounding the breeding habitat. Staff estimates breeding habitat on site as 21.4 acres, and surrounding suitable foraging and cover habitat (i.e., 45 meter buffer) as 143.3 acres. Therefore, staff concludes this condition would require the acquisition and dedication in perpetuity of 207.5 acres of habitat. The project owner shall provide funding for the acquisition, initial habitat improvements, and long-term management of the compensation lands, as described below.

Biological Resources Table 17
Mojave Fringe-toed Lizard Compensation Acreage Summary

Habitat Function	Project Impact Acreage	Mitigation Ratio	Compensation Acreage
Foraging and cover	143.3 acres	1:1	143.3 acres
Breeding	21.4 acres	3:1	64.2 acres
Total	164.7 acres		207.5 acres

This compensation acreage may be included ("nested") within the acreage acquired and managed as desert tortoise habitat compensation (Condition of Certification **BIO-17)** only if:

Adequate acreage of qualifying desert tortoise compensation lands also meet the Selection Criteria (below) as habitat for Mojave fringe-toed lizard;

The desert tortoise habitat compensation lands are acquired and dedicated as permanent conservation lands within 18 months of the start of ~~project construction~~Pre-Construction Site Mobilization.

If these two criteria are not met, then the project owner shall provide the required number of acres of Mojave fringe-toed lizard habitat compensation lands, adjusted to reflect the final project footprint and additional delineation of suitable habitat, independent of any compensation land required under other conditions of certification, and shall also provide funding for the initial improvement and long-term maintenance and management of the acquired lands, and shall comply with other related requirements this condition. Costs of these requirements are estimated to be $674,211.24 based on the acquisition of 207.5 acres (see **Revised Biological Resources Tables 5** and **6** for a complete breakdown of estimated costs). Regardless of actual cost, the project owner shall be responsible for funding all requirements of this condition.

The project owner shall provide financial assurances as described below, in the amount of $660,416.25. In lieu of acquiring lands itself, the Project owner may satisfy the requirements of this condition by providing funds for the acquisition to the

Renewable Energy Action Team (REAT) Account established with the National Fish and Wildlife Foundation (NFWF), as described below. If the Project owner elects to establish a REAT NFWF Account and have NFWF and the resource agencies complete the required habitat compensation, then the total estimated cost of complying with this condition is $674,211.24. The amount of security or NFWF deposit shall be adjusted up or down to reflect any revised cost estimates recommended by REAT.

The actual costs to comply with this condition will vary depending on the final footprint of the Project, the actual costs of acquiring compensation habitat, the costs of initially improving the habitat, and the actual costs of long-term management as determined by a Property Analysis Report (below). The 207.5 acre habitat requirement, and associated funding requirements based on that acreage, shall be adjusted up or down if there are changes in the final footprint of the project or the associated costs of evaluation, acquisition, management, and other factors listed in **Revised Biological Resources Tables 5** and **6.** Regardless of actual cost, the project owner shall be responsible for implementing all aspects of this condition.

COMPENSATORY MITIGATION LAND ACQUISITION

1. Method of Acquisition. Compensation lands shall be acquired by either of the two options listed below. Regardless of the method of acquisition, the transaction shall be complete only upon completion of all terms and conditions described in this Condition of Certification.

The project owner shall acquire lands and transfer title and/or conservation easement to a state or federal land management agency or to a third-party non-profit land management organization, as approved by the CPM in consultation with BLM, CDFG, and USFWS; or

The Project owner shall deposit funds into a project-specific subaccount within the REAT Account established with the NFWF, in the amount as indicated in **Revised Biological Resources Tables 5** and **6** (adjusted to reflect final project footprint and any applicable REAT adjustments to costs).

2. Selection Criteria for Compensation Lands. The compensation lands selected for acquisition to meet Energy Commission requirements shall:

   a. Be sand dune or partially stabilized sand dune habitat with potential to contribute to Mojave fringe-toed lizard habitat connectivity and build linkages between known populations of Mojave fringe-toed lizards and preserve lands with suitable habitat;

Be biologically contiguous to lands currently occupied by Mojave fringe-toed lizard;

Be near larger blocks of lands that are either already protected or planned for protection, or which could feasibly be protected long-term by a public resource agency or a non-governmental organization dedicated to habitat preservation;

Provide quality habitat for Mojave fringe-toed lizard, that has the capacity to regenerate naturally when disturbances are removed;

Not have a history of intensive recreational use or other disturbance that might make habitat recovery and restoration infeasible;

Not be characterized by high densities of invasive species, either on or immediately adjacent to the parcels under consideration, that might jeopardize habitat recovery and restoration;

Not contain hazardous wastes;

Have water and mineral rights included as part of the acquisition, unless the CPM, in consultation with CDFG, BLM and USFWS, agrees in writing to the acceptability of land without these rights; and

Be on land for which long-term habitat management for Mojave fringe-toed lizard and other native biological resources is feasible.

Review and Approval of Compensation Lands Prior to Acquisition. The project owner shall submit a formal acquisition proposal to the CPM describing the parcel(s) intended for purchase. This acquisition proposal shall discuss the suitability of the proposed parcel(s) as compensation lands for Mojave fringe-toed lizard in relation to the criteria listed above and must be approved by the CPM. The CPM will share the proposal with and consult with CDFG, BLM, and the USFWS before deciding whether to approve or disapprove the proposed acquisition.

Compensation Lands Acquisition Conditions: The project owner shall comply with the following conditions relating to acquisition of the compensation lands after the CPM, in consultation with CDFG, BLM and the USFWS, have approved the proposed compensation lands:

a. Preliminary Report: The Project owner, or approved third party, shall provide a recent preliminary title report, initial hazardous materials survey report, biological analysis, and other necessary or requested documents for the proposed compensation land to the CPM. All documents conveying or conserving compensation lands and all conditions of title are subject to review and approval by the CPM, in consultation with CDFG, BLM and the USFWS. For conveyances to the State, approval may also be required from the California Department of General Services, the Fish and Game Commission and the Wildlife Conservation Board.

Title/Conveyance: The Project owner shall acquire and transfer fee title to the compensation lands, a conservation easement over the lands, or both fee title and conservation easement as required by the CPM in consultation with CDFG.

Any transfer of a conservation easement or fee title must be to CDFG, a non-profit organization qualified to hold title to and manage compensation lands (pursuant to California Government Code section 65965), or to BLM or other public agency approved by the CPM in consultation with CDFG. If an approved non-profit organization holds fee title to the compensation lands, a conservation easement shall be recorded in favor of CDFG or another entity approved by the CPM. If an approved non-profit holds a conservation easement, CDFG shall be named a third party beneficiary. If an entity other than CDFG holds a conservation easement over the compensation lands, the CPM may require that CDFG or another entity approved by the CPM, in consultation with CDFG, be named a third party beneficiary of the conservation easement. The Project owner shall obtain approval of the CPM, in consultation with CDFG, of the terms of any transfer of fee title or conservation easement to the compensation lands.

Property Analysis Record: Upon identification of the compensation lands, the Project owner shall conduct a Property Analysis Record (PAR) or PAR-like analysis to establish the appropriate amount of the long-term maintenance and management fund to pay the in-perpetuity management of the compensation lands. The PAR or PAR-like analysis must be approved by the CPM, in consultation with CDFG, before it can be used to establish funding levels or management activities for the compensation lands.

5. Compensation Lands Acquisition Costs: The Project owner shall pay all other costs related to acquisition of compensation lands and conservation easements. In addition to actual land costs, these acquisition costs shall include but shall not be limited to the items listed below. Management costs including site cleanup measures are described separately, in the following section.

Level 1 Environmental Site Assessment;

Appraisal;

Title and document review costs;

Expenses incurred from other state, federal, or local agency reviews;

Closing and escrow costs;

Overhead costs related to providing compensation lands to CDFG or an approved third party;

Biological survey(s) to determine mitigation value of the land; and

Agency costs to accept the land (e.g., writing and recording of conservation easements; title transfer).

COMPENSATORY MITIGATION LAND IMPROVEMENT

1. Land Improvement Requirements: The Project owner shall fund activities that the CPM, in consultation with the CDFG, USFWS and BLM, requires for the initial

protection and habitat improvement of the compensation lands. These activities will vary depending on the condition and location of the land acquired, but may include surveys of boundaries and property lines, installation of signs, trash removal and other site cleanup measures, construction and repair of fences, invasive plant removal, removal of roads, and similar measures to protect habitat and improve habitat quality on the compensation lands.

The costs of these activities are estimated at $250 an acre, but will vary depending on the measures that are required for the compensation lands. A non-profit organization, CDFG or another public agency may hold and expend the habitat improvement funds if it is qualified to manage the compensation lands (pursuant to California Government Code section 65965), if it meets the approval of the CPM in consultation with CDFG, and if it is authorized to participate in implementing the required activities on the compensation lands. If CDFG takes fee title to the compensation lands, the habitat improvement fund must be paid to CDFG or its designee.

COMPENSATORY MITIGATION LAND LONG-TERM MANAGEMENT

Long-term Management Requirements: Long-term management is required to ensure that the compensation lands are managed and maintained to protect and enhance habitat for Mojave fringe-toed lizard. Management activities may include maintenance of signs, fences, removal of invasive weeds, monitoring, security and enforcement, and control or elimination of unauthorized use.

Long-term Management Plan. The project owner shall pay for the preparation of a Management Plan for the compensation lands. The Management Plan shall reflect site-specific enhancement measures on the acquired compensation lands. The plan shall be submitted for approval of the CPM, in consultation with CDFG, BLM and USFWS.

3. Long-Term Maintenance and Management Funding. The Project owner shall provide money to establish an account with a long-term maintenance and management. that will be used to fund the longterm maintenance and management of the compensation lands. The amount of money to be paid will be determined through an approved PAR or PAR-like analysis conducted for the compensation lands. The amount of required funding is initially estimated to be $1,450 for every acre of compensation lands. If compensation lands will not be identified and a PAR or PAR-like analysis completed within the time period specified for this payment (see the verification section at the end of this condition), the project owner shall provide initial payment of $1,450 an acre for the acres identified in the verified and approved delineation of habitat required by this condition, or if the delineation is not completed, shall provide $300,875 calculated at $1,450 an acre for 207.5 acres into an account for long-term maintenance and management of compensation lands. The amount of the required initial payment or security for this item shall be adjusted for any

change in the Project footprint as described above. If an initial payment is made based on the estimated per-acre costs, the project owner shall deposit additional money as may be needed to provide the full amount of long-term maintenance and management funding indicated by a PAR or PAR-like analysis, once the analysis is completed and approved. If the approved analysis indicates less than $1,450 an acre will be required for long-term maintenance and management, the excess paid will be returned to the Project owner.

The project owner must obtain the CPM's approval of the entity that will receive and hold the long-term maintenance and management fund for the compensation lands. The CPM will consult with CDFG before deciding whether to approve an entity to hold the project's long-term maintenance and management funds. The CPM, in consultation with CDFG, may designate another non-profit organization to hold the long-term maintenance and management fee if the organization is qualified to manage the compensation lands in perpetuity.

If CDFG takes fee title to the compensation lands, CDFG shall determine whether it will hold the long-term management fee in the special deposit fund, leave the money in the REAT Account, or designate another entity to manage the long-term maintenance and management fee for CDFG and with CDFG supervision.

The Project owner shall ensure that an agreement is in place with the long-term maintenance and management fee holder/manager to ensure the following conditions:

i. Interest. Interest generated from the initial capital shall be available for reinvestment into the principal and for the long-term operation, management, and protection of the approved compensation lands, including reasonable administrative overhead, biological monitoring, improvements to carrying capacity, law enforcement measures, and any other action designed to protect or improve the habitat values of the compensation lands.

Withdrawal of Principal. The long-term maintenance and management fee principal shall not be drawn upon unless such withdrawal is deemed necessary by the CPM, in consultation with CDFG, or the approved third-party long-term maintenance and management fee manager to ensure the continued viability of the species on the compensation lands. If CDFG takes fee title to the compensation lands, monies received by CDFG pursuant to this provision shall be deposited in a special deposit fund established solely for the purpose to manage lands in perpetuity unless CDFG designates NFWF or another entity to manage the longterm maintenance and management fee for CDFG.

Pooling Funds. A CPM-approved non-profit organization qualified to hold long-term maintenance and management fees solely for the purpose to manage lands in perpetuity, may pool the fund with other funds for the operation, management, and protection of the compensation lands for local populations of Mojave fringe-

toed lizard. However, for reporting purposes, the long-term maintenance and management fee fund must be tracked and reported individually to the CPM.

iv. Reimbursement Fund. The project owner shall provide reimbursement to CDFG or an approved third party for reasonable expenses incurred during title, easement, and documentation review; expenses incurred from other State or State-approved federal agency reviews; and overhead related to providing compensation lands.

COMPENSATORY MITIGATION LAND SECURITY

1. Compensation Mitigation Security: The project owner shall provide security sufficient for funding acquisition, improvement, and longterm management of Mojave fringe-toed lizard compensation land. Financial assurance can be provided to the CPM in the form of an irrevocable letter of credit, a pledged savings account or another form of security ("Security"). Prior to submitting the Security to the CPM, the Project owner shall obtain the CPM's approval, in consultation with CDFG, BLM and the USFWS, of the form of the Security.

The security amount shall be based on the estimates provided in **Revised Biological Resources Tables 5** and **6.** This amount shall be updated and verified prior to payment and shall be adjusted to reflect actual costs or more current estimates as agreed upon by the REAT agencies.

The Project owner shall provide verification that financial assurances have been established to the CPM with copies of the document(s) to BLM, CDFG and the USFWS, to guarantee that an adequate level of funding is available to implement any of the mitigation measures required by this condition that are not completed prior to the start of ground-disturbing activities described in Section A of this condition.

In the event that the project owner defaults on the Security, the CPM may use money from the Security solely for implementation of the requirements of this condition. The CPM's use of the security to implement measures in this condition may not fully satisfy the Project owner's obligations under this condition. Any amount of the Security that is not used to carry out mitigation shall be returned to the Project owner upon successful completion of the associated requirements in this condition.

Security for the requirements of this condition shall be provided in the amount of $660,416.25 (or $674,211.24 if the project owner elects to use the REAT Account with NFWF pursuant to paragraph 4 of this condition, below). The Security is calculated in part from the items that follow but adjusted as specified below (consult **Revised Biological Resources Tables 5** and **6** for the complete breakdown of estimated costs). However, regardless of the amount of the security or actual cost

of implementation, the project owner shall be responsible for implementing all aspects of this condition.

land acquisition costs for compensation land, calculated at $1,000/acre;

Site assessments, appraisals, biological surveys, transaction closing and escrow costs, calculated as $18,000 total per parcel (presuming 320 acres per parcel);

Initial site clean-up, restoration, or enhancement, calculated at $250/acre;

Third-party and agency administrative transaction costs and overhead, calculated as percentages of land cost;

v. Long-term management and maintenance fund, calculated at $1,450 per acre; vi. NFWF fees to establish a project-specific account; manage the sub-account for acquisition and initial site work; and manage the sub-account for long term management and maintenance.

Phasing of Security Payment: Compensatory Mitigation Land Security may be phased according to phasing of the project's approval and construction. Phasing of compensation funding shall be based upon land disturbance and habit impacts for each project phase. Phasing of the mitigation payment is described further in staff's recommended Condition of Certification **BIO-31.**

The project owner may elect to comply with some or all of the requirements in this condition by providing funds to implement the requirements into the Renewable Energy Action Team (REAT) Account established with the National Fish and Wildlife Foundation (NFWF). To use this option, the Project owner must make an initial deposit to the REAT Account in an amount equal to the estimated costs of implementing the requirement (as set forth in the Security section of this condition, paragraph 3, above). If the actual cost of the acquisition, initial protection and habitat improvements, ~~longterm~~long-term funding or other cost is more than the estimated amount initially paid by the project owner, the project owner shall make an additional deposit into the REAT Account sufficient to cover the actual acquisition costs, the actual costs of initial protection and habitat improvement on the compensation lands, the long-term funding requirements as established in an approved PAR or PAR-like analysis, or the other actual costs that are estimated in the table. If those actual costs or PAR projections are less than the amount initially transferred by the ~~applicant~~project owner, the remaining balance shall be returned to the project owner.

The responsibility for acquisition of compensation lands may be delegated to a third party other than NFWF, such as a nongovernmental organization supportive of desert habitat conservation, by written agreement of the Energy Commission. Such delegation shall be subject to approval by the CPM, in consultation with CDFG, BLM and USFWS, prior to land acquisition, enhancement or management

activities. Agreements to delegate land acquisition to an approved third party, or to manage compensation lands, shall be executed and implemented within 18 months of the Energy Commission's certification of the project.

The project owner may request the CPM to provide it with all available information about any funds held by the Energy Commission, CDFG, or NFWF as project security, or funds held in a NFWF sub-account for this project, or other project-specific account held by a third party. The CPM shall also fully cooperate with any independent audit that the project owner may choose to perform on any of these funds.

Verification: The project owner shall provide the CPM with written notice of intent to start ground disturbance at least 30 days prior to the start of ~~ground-disturbing activities on the project site~~Pre-Construction Site Mobilization.

If the mitigation actions required under this condition are not completed at least 30 days prior to the start of ~~ground-disturbing activities~~any phase of Pre-Construction Site Mobilization, the Project owner shall provide the CPM and CDFG with an approved Security for such phase in accordance with this condition of certification no later than 30 days prior to ~~beginning Project ground-disturbing activities~~start of Pre-Construction Site Mobilization for such phase. Prior to submitting the Security to the CPM, the project owner shall obtain the CPM's approval, in consultation with CDFG, BLM and the USFWS, of the form of the Security. The project owner, or an approved third party, shall complete and provide written verification to the CPM, CDFG, BLM and USFWS of the compensation lands acquisition and transfer within 18 months of the start of ~~Project ground-disturbing activities~~Pre-Construction Site Mobilization.

No later than 12 months after the start of any phase of ~~ground-disturbing project activities~~Pre-Construction Site Mobilization, the project owner shall submit a formal acquisition proposal to the CPM describing the parcels intended for purchase, and shall obtain approval from the CPM, in consultation with CDFG, BLM and USFWS, prior to the acquisition. If NFWF or another approved third party is handling the acquisition, the project owner shall fully cooperate with the third party to ensure the proposal is submitted within this time period. The project owner or an approved third party shall complete the acquisition and all required transfers of the compensation lands, and provide written verification to the CPM, CDFG, BLM and USFWS of such completion, no later than 18 months after the ~~issuance of the Energy Commission Decision~~start of Pre-Construction Site Mobilization. If NFWF or another approved third party is being used for the acquisition, the project owner shall ensure that funds needed to accomplish the acquisition are transferred in timely manner to facilitate the planned acquisition and to ensure the land can be acquired and transferred prior to the 18-month deadline.

The project owner shall complete and submit to the CPM a PAR or PAR-like analysis no later than 60 days after the CPM approves compensation lands for acquisition associated with any phase of construction. The project owner shall fully fund the required amount for long-term maintenance and management of the compensation lands for that phase of construction no later than 30 days after the CPM approves a PAR or PAR-like analysis of the anticipated long-term maintenance and management costs of the compensation lands. Written verification shall be provided to the CPM and CDFG to confirm payment of the long-term maintenance and management funds.

No later than 60 days after the CPM determines what activities are required to provide for initial protection and habitat improvement on the compensation lands for any phase of construction, the project owner shall make funding available for those activities and provide written verification to the CPM of what funds are available and how costs will be paid. Initial protection and habitat improvement activities on the compensation lands for that phase of construction shall be completed, and written verification provided to the CPM, no later than six months after the CPM's determination of what activities are required on the compensation lands.

The project owner, or an approved third party, shall provide the CPM, CDFG, BLM and USFWS with a management plan for the compensation lands associated with any phase of construction within180 days of the land or easement purchase, as determined by the date on the title. The CPM, in consultation with CDFG, BLM and the USFWS, shall approve the management plan after its content is acceptable to the CPM.

Within 90 days after completion of ~~all project related ground disturbance~~Pre-Construction Site Mobilization, the project owner shall provide to the CPM, CDFG, BLM and USFWS an analysis, based on aerial photography, with the final accounting of the amount of habitat disturbed during Project construction. This shall be the basis for the final number of acres required to be acquired.

GILA MONSTER MITIGATION

BIO-14 Concurrent with Desert Tortoise Clearance surveys (**BIO-15,** below), the project owner shall conduct pre-construction surveys for Gila monsters. If a Gila monster is encountered during clearance surveys or during construction, a qualified biologist experienced with Gila monster survey and capture techniques shall capture and maintain it in a cool (85 degrees F) environment until it can be released to a safe, suitable area beyond the construction impact zone. The biologist shall coordinate with staff and CDFG biologists in the transport and relocation of any Gila monsters encountered during project surveys, construction, or operation. A written

report documenting any Gila monsters relocated shall be provided to the CPM within 30 days of relocation.

Verification: Within 30 days after completion of clearance surveys the Designated Biologist shall submit a report to BLM's Wildlife Biologist, the CPM, USFWS, and CDFG describing implementation and results, including description of any relocation of Gila monsters. The report shall include the number of Gila monsters moved; their state of health, including wounds or visible signs of illness; and the location of relocation.

DESERT TORTOISE CLEARANCE SURVEYS AND EXCLUSION FENCING

BIO-15 The project owner shall undertake appropriate measures to manage the construction site and related facilities in a manner to avoid or minimize impacts to desert tortoise. Methods for clearance surveys, fence specification and installation, tortoise handling, artificial burrow construction, egg handling and other procedures shall be consistent with those described in the USFWS' 2009 *Desert Tortoise Field Manual* http://www.fws.gov/ventura/speciesinfo/protocols guidelines or more current guidance provided by CDFG and USFWS. The project owner shall also implement all terms and conditions described in the Biological Opinion for the Project prepared by USFWS. These measures include, but are not limited to, the following:

1. Desert Tortoise Exclusion Fence Installation. To avoid impacts to desert tortoises, permanent desert tortoise exclusion fencing shall be installed along the permanent perimeter security fence and temporarily installed along the utility corridors at tower locations, laydown areas, or other staging areas. Tortoise exclusion fencing shall also be installed as necessary to prevent tortoises on the southern NAP (not a part) area (between the project site and Interstate-40) to prevent tortoises from entering the highway. If the culvert areas cannot be fenced due to restrictions associated with highway maintenance, the two tortoises would be translocated off the site (see **BIO-16).** The proposed alignments for the permanent perimeter fence and utility rights-of-way fencing shall be flagged and surveyed within 24 hours prior to the initiation of fence construction. Clearance surveys of the perimeter fence and utility rights-of-way alignments shall be conducted by the Designated Biologist(s) using techniques approved by the USFWS and CDFG and may be conducted in any season with USFWS and CDFG approval. Biological Monitors may assist the Designated Biologist under his or her supervision with the approval of the CPM, BLM, USFWS, and CDFG. These fence clearance surveys shall provide 100-percent coverage of all areas to be disturbed and an additional transect

along both sides of the fence line. This fence line transect shall cover an area approximately 90 feet wide centered on the fence alignment. Transects shall be no greater than 15 feet apart. All desert tortoise burrows, and burrows constructed by other species that might be used by desert tortoises, shall be examined to assess occupancy of each burrow by desert tortoises and handled in accordance with the USFWS' 2009 *Desert Tortoise Field Manual.* Any desert tortoise located during fence clearance surveys shall be handled by the Designated Biologist(s) in accordance with the USFWS' 2009 *Desert Tortoise Field Manual.*

a. Timing, Supervision of Fence Installation. The exclusion fencing shall be installed prior to the onset of site clearing and grubbing. Fencing shall also be placed along both sides of any construction access roads within tortoise habitat but outside the fenced construction area, and maintained throughout the construction phase of the project, unless otherwise approved by the CPM, BLM Wildlife Biologist, USFWS, and CDFG. The fence installation shall be supervised by the Designated Biologist and monitored by the Biological Monitors to ensure the safety of any tortoise present.

Fence Material and Installation. The permanent tortoise exclusionary fencing shall be constructed in accordance with the USFWS' 2009 *Desert Tortoise Field Manual* (Chapter 8 – Desert Tortoise Exclusion Fence).

Security Gates. Security gates shall be designed with minimal ground clearance to deter ingress by tortoises. The gates may be electronically activated to open and close immediately after the vehicle(s) have entered or exited to prevent the gates from being kept open for long periods of time. Cattle grating designed to safely exclude desert tortoise shall be installed at the gated entries to discourage tortoises from gaining entry.

Fence Inspections. Following installation of the desert tortoise exclusion fencing for both the permanent site fencing and temporary fencing in the utility corridors, the fencing shall be regularly inspected. If tortoise were moved out of harm's way during fence construction, permanent and temporary fencing shall be inspected at least two times a day for the first 7 days to ensure a recently moved tortoise has not been trapped within the fence. Thereafter, permanent fencing shall be inspected monthly and during and within 24 hours following all major rainfall events. A major rainfall event is defined as one for which surface flow is detectable within the fenced drainage during the storm, or for which channels on-site show any evidence of newly deposited sediments, bank erosion, or channel reworking following the storm. The project owner shall be responsible for monitoring storm flows and changes to channels to evaluate need for fence inspection. Any damage to the fencing shall be temporarily repaired immediately to keep tortoises out of the site, and permanently repaired within 48 hours of observing damage. Inspections of permanent site

fencing shall occur for the life of the project. Temporary fencing shall be inspected weekly and, where drainages intersect the fencing, during and within 24 hours following major rainfall events. All temporary fencing shall be repaired immediately upon discovery and, if the fence may have permitted tortoise entry while damaged, the Designated Biologist shall inspect the area for tortoise.

Derailment or other emergency. In the case of derailment or other emergency, project owner is required to provide BNSF access to the Project site for emergency response. This access may include, among other activities, temporary removal of portions of the desert tortoise exclusionary fencing, the immediate placement of a temporary fence and the placement of the applicable portion of the permanent fence within 48 hours of the temporary removal of such portion.

2. Desert Tortoise Clearance Surveys within the Plant Site. Following construction of the permanent perimeter security fence and the attached tortoise exclusion fence, the permanently fenced power plant site shall be cleared of tortoises by the Designated Biologist, who may be assisted by the Biological Monitors. Clearance surveys shall be conducted in accordance with the USFWS' 2009 *Desert Tortoise Field Manual* (Chapter 6 – Clearance Survey Protocol for the Desert Tortoise – Mojave Population) and shall consist of two surveys covering 100 percent the project area by walking transects no more than 15-feet apart. If a desert tortoise is located on the second survey, a third survey shall be conducted. Each separate survey shall be walked in a different direction to allow opposing angles of observation. Clearance surveys of the power plant site may only be conducted when tortoises are most active (April through May or September through October). Surveys outside of these time periods require approval by USFWS and CDFG. Any tortoise located during clearance surveys of the power plant site shall be relocated and monitored in accordance with the Desert Tortoise Translocation Plan (Condition of Certification **BIO-1 6).**

Burrow Searches. During clearance surveys all desert tortoise burrows, and burrows constructed by other species that might be used by desert tortoises, shall be examined by the Designated Biologist, who may be assisted by the Biological Monitors, to assess occupancy of each burrow by desert tortoises and handled in accordance with the USFWS' 2009 *Desert Tortoise Field Manual.* To prevent reentry by a tortoise or other wildlife, all burrows shall be collapsed once absence has been determined. Tortoises taken from burrows and from elsewhere on the power plant site shall be translocated as described in the Desert Tortoise Translocation Plan.

Burrow Excavation/Handling. All potential desert tortoise burrows located during clearance surveys would be excavated by hand, tortoises removed, and collapsed or blocked to prevent occupation by desert tortoises. All desert tortoise handling and removal, and burrow excavations, including nests, would be

conducted by the Designated Biologist, who may be assisted by a Biological Monitor in accordance with the USFWS' 2009 *Desert Tortoise Field Manual.*

Monitoring Following Clearing. Following the desert tortoise clearance and removal from the power plant site and utility corridors and initial memo or verbal completion report shall be sent to BLM's Wildlife Biologist, the CPM, USFWS, and CDFG (see item 4 below), workers and heavy equipment shall be allowed to enter the project site to perform clearing, grubbing, leveling, and trenching. A Designated Biologist shall monitor clearing and grading activities to find and move tortoises missed during the initial tortoise clearance survey. Should a tortoise be discovered, it shall be translocated as described in the Desert Tortoise Translocation Plan to an area approved by the Designated Biologist.

Reporting. The Designated Biologist shall record the following information for any desert tortoises handled: a) the locations (narrative and maps) and dates of observation; b) general condition and health, including injuries, state of healing and whether desert tortoise voided their bladders; c) location moved from and location moved to (using GPS technology); d) gender, carapace length, and diagnostic markings (i.e., identification numbers or marked lateral scutes); e) ambient temperature when handled and released; and f) digital photograph of each handled desert tortoise as described in the paragraph below. Desert tortoise moved from within project areas shall be marked and monitored in accordance with the Desert Tortoise Translocation Plan.

Verification: All mitigation measures and their implementation methods shall be included in the BRMIMP and implemented. Implementation of the measures shall be reported in the Monthly Compliance Reports by the Designated Biologist. Immediately upon completion of clearance surveys and desert tortoise removal from the site, the Designated Biologist shall provide an initial memo or verbal report of the results to BLM's Wildlife Biologist, the CPM, USFWS, and CDFG. Within 30 days after completion of desert tortoise clearance surveys the Designated Biologist shall submit a report to BLM's Wildlife Biologist, the CPM, USFWS, and CDFG describing implementation of each of the mitigation measures listed above ~~and compliance with Gila monster clearance survey (**BIO14**)~~**.** The report shall include the desert tortoise survey results, capture and release locations of any relocated desert tortoises, and any other information needed to demonstrate compliance with the measures described above.

DESERT TORTOISE TRANSLOCATION PLAN

BIO-16 The project owner shall develop and implement a final Desert Tortoise Translocation Plan (Plan) in conformance with standards and guidelines described in *Translocation of Desert Tortoises (Mojave Population) From Project Sites: Plan Development Guidance* (USFWS 2010), any more current

guidance or recommendations as available from CDFG or USFWS, and meets the approval of USFWS, CDFG, BLM's Wildlife Biologist and the CPM. The goal of the Plan shall be to safely exclude desert tortoises from within the fenced project area and translocate them to suitable habitat capable of supporting them, while minimizing stress and potential for disease transmission. Tortoises to be moved farther than 500 meters shall be tested for disease prior to translocation. The Plan shall include written correspondence with CalTrans indicating whether tortoise exclusion fencing may be installed to prevent tortoises on the southern NAP area (between the project site and Interstate-40) to prevent tortoises from entering the highway. If CalTrans does not permit that fencing, then desert tortoises shall be translocated off the NAP site (see **BIO-15).** The final Plan shall be based on the draft Desert Tortoise Translocation Plan prepared by the applicant and shall include all revisions deemed necessary by USFWS, CDFG, BLM'S Wildlife Biologist, and staff. The Plan shall include but not be limited to, a list of the authorized handlers, protocols for disease testing and assessing tortoise health, proposed translocation locations and procedures, schedule of translocations, a habitat assessment of translocation lands, monitoring and reporting, and contingency planning (e.g., handling an injured or diseased tortoise).

Verification: ~~Within 30 days of publication of the Energy Commission License Decision or BLM's Record of Decision/ROW Issuance, whichever comes first~~At least 30 days prior to the start of Pre-Construction Site Mobilization, the project owner shall provide BLM's Wildlife Biologist and the CPM with the final version of a Desert Tortoise Translocation Plan that has been reviewed and approved by BLM's Wildlife Biologist and the CPM in consultation with USFWS and CDFG. The plan shall include the locations of the translocation sites. The project owner may not translocate more than 98 tortoises unless the project owner first provides the CPM with documentation demonstrating that adequate translocation sites have been identified, and obtains CPM approval of those translocation sites. All modifications to the approved Plan shall be made only after approval by BLM's Wildlife Biologist and the CPM, in consultation with USFWS and CDFG. Within 30 days after initiation of translocation activities, the Designated Biologist shall provide to BLM's Wildlife Biologist and the CPM for review and approval, a written report identifying which items of the Plan have been completed, and a summary of all modifications to measures made during implementation of the Plan. Written monthly progress reports shall be provided to the BLM's Wildlife Biologist and CPM for the duration of the Plan implementation, including the duration of monitoring of translocated tortoises.

DESERT TORTOISE COMPENSATORY MITIGATION

BIO-17 The project owner shall provide compensatory mitigation acreage of 10,302 acres of desert tortoise habitat lands, adjusted to reflect the final project footprint, as specified in this condition. In addition, the project owner shall provide funding for initial improvement and long term maintenance, enhancement, and management of the acquired lands for protection and enhancement of desert tortoise populations, and comply with other related requirements of this condition. This acreage was calculated as follows: a ratio of 1:1 for the project area south of the BNSF railroad tracks (2,140 acres); a ratio of 3:1 ratio for 2,104 acres of the project area north of the BNSF railroad tracks; and a ratio of 5:1 for 370 additional acres north of the BNSF railroad tracks. See **Table,** below.

Desert Tortoise Compensation Acreage Summary:

Location	Project Impact Acreage	Mitigation Ratio	Compensation Acreage
South of BNSF RR	2,140 acres	1:1	2,140 acres
Immeditately North of BNSF RR ~~(southern Phase 1b~~	~~2..104~~2.,104 acres	3:1	6,312 acres
Far North of BNSF RR ~~(northern Phase 2 Scenario 5.5~~	370 acres	5:1	1,850 acres
~~Scenario 5.5~~ **Total**	**4,613 acres**		**10,302 acres**

Costs of these requirements are estimated to be $31,079,934.00 for ~~Scenario 5.5~~the Project (see Ex. 317, **Biological Resources Addendum Tables 5** and **7** for a complete breakdown of costs and acreage).

As many as 4,613 acres of the compensation lands requirement may be satisfied by ~~applicant~~project owner's compliance with the desert tortoise habitat acquisition or enhancement requirements of BLM, to be calculated as an acre-for-acre offset in the Energy Commission requirement for mitigation provided to satisfy BLM's requirements. For purposes of this paragraph, credit will be given for BLM-required mitigation without regard to whether BLM uses the mitigation funds for habitat acquisition or for enhancement projects to benefit the species.

These impact acreages shall be adjusted to reflect the final project footprint. For purposes of this condition, the Project footprint means all lands disturbed in the construction and operation of the Calico Solar Project, including all linear project components, as well as all undeveloped areas inside the Project's boundaries.

The project owner shall provide financial assurances as described below in the amount of $31,079,934.00. In lieu of acquiring lands itself, the Project owner may satisfy the requirements of this condition by depositing funds into a Renewable Energy Action Team (REAT) Account established with the National Fish and Wildlife Foundation (NFWF), as described below. If the Project owner elects to establish a REAT NFWF Account and have NFWF and the agencies complete the required habitat compensation, then the total estimated cost of complying with this condition is $31,755,574.02. The amount of security or NFWF deposit shall be adjusted up or down to reflect any revised cost estimates recommended by REAT.

The actual costs to comply with this condition will vary depending on the final footprint of the Project, the costs of acquiring compensation habitat, the costs of initially improving the habitat, and the actual costs of long-term management as determined by a Property Analysis Report or similar analysis (below). The 4,613 acre habitat requirement, and associated funding requirements based on that acreage, shall be adjusted up or down if there are changes in the final footprint of the project or the associated costs of evaluation, acquisition, management, and other factors listed in **Biological Resources Addendum Tables 5** and **7.** Regardless of actual cost, the project owner shall be responsible for funding all requirements of this condition.

COMPENSATORY MITIGATION LAND ACQUISITION

1. Method of Acquisition. Compensation lands shall be acquired by either of the two options listed below. Regardless of the method of acquisition, the transaction shall be complete only upon completion of all terms and conditions described in this Condition of Certification.

The project owner shall acquire lands and transfer title and/or conservation easement to a state or federal land management agency or to a third-party non-profit land management organization, as approved by the CPM in consultation with BLM, CDFG, and USFWS; or

The Project owner shall deposit funds into a project-specific subaccount within the REAT Account established with the NFWF, in the amount as indicated in **Biological Resources Addendum Tables 5** and **7** (adjusted to reflect final project footprint and any applicable REAT adjustments to costs).

2. Selection Criteria for Compensation Lands. The compensation lands selected for acquisition to meet Energy Commission and CESA requirements shall be equal to or better than the quality and function of the habitat impacted and:

a. be within the Western Mojave Recovery Unit, with potential to contribute to desert tortoise habitat connectivity and build linkages between desert tortoise designated critical habitat, known populations of desert tortoise, and/or other preserve lands; provide habitat for desert tortoise with capacity to regenerate naturally when disturbances are removed;

be near larger blocks of lands that are either already protected or planned for protection, or which could feasibly be protected long-term by a public resource agency or a nongovernmental organization dedicated to habitat preservation;

be contiguous and biologically connected to lands currently occupied by desert tortoise, ideally with populations that are stable, recovering, or likely to recover;

not have a history of intensive recreational use or other disturbance that might cause future erosional damage or other habitat damage, and make habitat recovery and restoration infeasible;

not be characterized by high densities of invasive species, either on or immediately adjacent to the parcels under consideration, that might jeopardize habitat recovery and restoration; and

not contain hazardous wastes that cannot be removed to the extent that the site could not provide suitable habitat; and

h. have water and mineral rights included as part of the acquisition, unless the CPM, in consultation with CDFG, BLM and USFWS, agrees in writing to the acceptability of land without these rights.

Review and Approval of Compensation Lands Prior to Acquisition. The project owner shall submit a formal acquisition proposal to the CPM describing the parcel(s) intended for purchase. This acquisition proposal shall discuss the suitability of the proposed parcel(s) as compensation lands for desert tortoise in relation to the criteria listed above and must be approved by the CPM. The CPM will share the proposal with and consult with CDFG, BLM and the USFWS before deciding whether to approve or disapprove the proposed acquisition.

Compensation Lands Acquisition Conditions: The project owner shall comply with the following conditions relating to acquisition of the compensation lands after the CPM, in consultation with CDFG, BLM and the USFWS have approved the proposed compensation lands:

a. Preliminary Report: The Project owner, or approved third party, shall provide a recent preliminary title report, initial hazardous materials survey report, biological analysis, and other necessary or requested documents for the proposed compensation land to the CPM. All documents conveying or conserving compensation lands and all conditions of title are subject to review and approval by the CPM, in consultation with CDFG, BLM and the USFWS. For conveyances to the State, approval may also be required from the California Department of

General Services, the Fish and Game Commission and the Wildlife Conservation Board.

Title/Conveyance: The Project owner shall acquire and transfer fee title to the compensation lands, a conservation easement over the lands, or both fee title and conservation easement as required by the CPM in consultation with CDFG. Any transfer of a conservation easement or fee title must be to CDFG, a non-profit organization qualified to hold title to and manage compensation lands (pursuant to California Government Code section 65965), or to BLM or other public agency approved by the CPM in consultation with CDFG. If an approved non-profit organization holds fee title to the compensation lands, a conservation easement shall be recorded in favor of CDFG or another entity approved by the CPM. If an approved non-profit holds a conservation easement, CDFG shall be named a third party beneficiary. If an entity other than CDFG holds a conservation easement over the compensation lands, the CPM may require that CDFG or another entity approved by the CPM, in consultation with CDFG, be named a third party beneficiary of the conservation easement. The Project owner shall obtain approval of the CPM, in consultation with CDFG, of the terms of any transfer of fee title or conservation easement to the compensation lands.

Property Analysis Record. Upon identification of the compensation lands, the Project owner shall conduct a Property Analysis Record (PAR) or PAR-like analysis to establish the appropriate amount of the long-term maintenance and management fund to pay the in-perpetuity management of the compensation lands. The PAR or PAR-like analysis must be approved by the CPM, in consultation with CDFG, before it can be used to establish funding levels or management activities for the compensation lands.

5. Compensation Lands Acquisition Costs: The Project owner shall pay all other costs related to acquisition of compensation lands and conservation easements. In addition to actual land costs, these acquisition costs shall include but shall not be limited to the items listed below. Management costs including site cleanup measures are described separately, in the following section.

Level 1 Environmental Site Assessment;

Appraisal;

Title and document review costs;

Expenses incurred from other state, federal, or local agency reviews;

Closing and escrow costs;

Overhead costs related to providing compensation lands to CDFG or an approved third party;

Biological survey(s) to determine mitigation value of the land; and

Agency costs to accept the land (e.g., writing and recording of conservation easements; title transfer).

COMPENSATORY MITIGATION LAND IMPROVEMENT

1. Land Improvement Requirements: The Project owner shall fund activities that the CPM, in consultation with the CDFG, USFWS and BLM, requires for the initial protection and habitat improvement of the compensation lands. These activities will vary depending on the condition and location of the land acquired, but may include surveys of boundaries and property lines, installation of signs, trash removal and other site cleanup measures, construction and repair of fences, invasive plant removal, removal of roads, and similar measures to protect habitat and improve habitat quality on the compensation lands.

   The costs of these activities are estimated at $250 an acre, but will vary depending on the measures that are required for the compensation lands. A non-profit organization, CDFG or another public agency may hold and expend the habitat improvement funds if it is qualified to manage the compensation lands (pursuant to California Government Code section 65965), if it meets the approval of the CPM in consultation with CDFG, and if it is authorized to participate in implementing the required activities on the compensation lands. If CDFG takes fee title to the compensation lands, the habitat improvement fund must be paid to CDFG or its designee.

COMPENSATORY MITIGATION LAND LONG-TERM MANAGEMENT

Long-term Management Requirements: Long-term management is required to ensure that the compensation lands are managed and maintained to protect and enhance habitat for desert tortoise. Management activities may include maintenance of signs, fences, removal of invasive weeds, monitoring, security and enforcement, and control or elimination of unauthorized use.

Long-term Management Plan. The project owner shall pay for the preparation of a Management Plan for the compensation lands. The Management Plan shall reflect site-specific enhancement measures on the acquired compensation lands. The plan shall be submitted for approval of the CPM, in consultation with CDFG, BLM and USFWS.

3. Long-Term Maintenance and Management Funding. The Project owner shall provide money to establish an account with a long-term maintenance and management. that will be used to fund the long term maintenance and management of the compensation lands. The amount of money to be paid will be determined through an approved PAR or PAR-like analysis conducted for the compensation lands. The amount of required funding is initially estimated to be $1,450 for every acre of compensation lands. If compensation lands will not be identified and a PAR

or PAR-like analysis completed within the time period specified for this payment (see the verification section at the end of this condition), the Project owner shall provide initial payment of $14,937,900.00 calculated at $1,450 an acre for each compensation acre, as shown in **Biological Resources Addendum Tables 5 and 7** (above into an account for long-term maintenance and management of compensation lands. The amount of the required initial payment or security for this item shall be adjusted for any change in the Project footprint as described above. If an initial payment is made based on the estimated per-acre costs, the project owner shall deposit additional money as may be needed to provide the full amount of long-term maintenance and management funding indicated by a PAR or PAR-like analysis, once the analysis is completed and approved. If the approved analysis indicates less than $1,450 an acre will be required for long-term maintenance and management, the excess paid will be returned to the Project owner.

The project owner must obtain the CPM's approval of the entity that will receive and hold the long-term maintenance and management fund for the compensation lands. The CPM will consult with the project owner and CDFG before deciding whether to approve an entity to hold the project's long-term maintenance and management funds on any lands. The CPM, in consultation with the project owner and CDFG, may designate another state agency or nonprofit organization to hold the long-term maintenance and management fee if the organization is qualified to manage the compensation lands in perpetuity.

If CDFG takes fee title to the compensation lands, CDFG shall determine whether it will hold the long-term management fee in the special deposit fund, leave the money in the REAT Account, or designate another entity to manage the long-term maintenance and management fee for CDFG and with CDFG supervision. The Project owner shall ensure that an agreement is in place with the long-term maintenance and management fee holder/manager to ensure the following conditions:

Interest. Interest generated from the initial capital shall be available for reinvestment into the principal and for the longterm operation, management, and protection of the approved compensation lands, including reasonable administrative overhead, biological monitoring, improvements to carrying capacity, law enforcement measures, and any other action approved by CDFG designed to protect or improve the habitat values of the compensation lands.

Withdrawal of Principal. The long-term maintenance and management fee principal shall not be drawn upon unless such withdrawal is deemed necessary by the CPM, in consultation with CDFG, or the approved third-party long-term maintenance and management fee manager to ensure the continued viability of the species on the compensation lands. If CDFG takes fee title to the compensation lands, monies received by CDFG pursuant to this provision shall be deposited in a special deposit fund established solely for the purpose to manage lands in perpetuity unless

CDFG designates NFWF or another entity to manage the longterm maintenance and management fee for CDFG.

Pooling Funds. A CPM- approved non-profit organization qualified to hold long-term maintenance and management fees solely for the purpose to manage lands in perpetuity, may pool the fund with other funds for the operation, management, and protection of the compensation lands for local populations of desert tortoise. However, for reporting purposes, the long-term maintenance and management fee fund must be tracked and reported individually to the CDFG and CPM.

Reimbursement Fund. The project owner shall provide reimbursement to CDFG or an approved third party for reasonable expenses incurred during title, easement, and documentation review; expenses incurred from other State or State-approved federal agency reviews; and overhead related to providing compensation lands.

COMPENSATORY MITIGATION LAND SECURITY

1. Compensation Mitigation Security: The project owner shall provide security sufficient for funding acquisition, improvement, and longterm management of desert tortoise compensation land. Financial assurance can be provided to the CPM in the form of an irrevocable letter of credit, a pledged savings account or another form of security ("Security"). Prior to submitting the Security to the CPM, the Project owner shall obtain the CPM's approval, in consultation with CDFG, BLM and the USFWS, of the form of the Security.

The security amount shall be based on the estimates provided in **Biological Resources Addendum Tables 5** and **7.** This amount shall be updated and verified prior to payment and shall be adjusted to reflect actual costs or more current estimates as agreed upon by the REAT agencies.

The Project owner shall provide verification that financial assurances have been established to the CPM with copies of the document(s) to BLM, CDFG and the USFWS, to guarantee that an adequate level of funding is available to implement any of the mitigation measures required by this condition that are not completed prior to the start of ground-disturbing activities described in Section A of this condition.

In the event that the project owner defaults on the Security, the CPM may use money from the Security solely for implementation of the requirements of this condition. The CPM's use of the security to implement measures in this condition may not fully satisfy the Project owner's obligations under this condition. Any amount of the Security that is not used to carry out mitigation shall be returned to the Project owner upon successful completion of the associated requirements in this condition.

Security for the requirements of this condition shall be provided in the amount of $31,079,934 (or $31,755,574.02 if the project owner elects to use the REAT Account with NFWF pursuant to paragraph 4 of this condition, below). The Security is calculated in part from the items that follow but adjusted as specified below (consult **Biological Resources Addendum Tables 5** and **7** for the complete breakdown of estimated costs). However, regardless of the amount of the security or actual cost of implementation, the project owner shall be responsible for implementing all aspects of this condition.

land acquisition costs for compensation land, calculated at $1,000/acre;

Site assessments, appraisals, biological surveys, transaction closing and escrow costs, calculated as $18,000 total per parcel (presuming 320 acres per parcel)

iii. Initial site clean-up, restoration, or enhancement, calculated at $250/acre;

Third-party and agency administrative transaction costs and overhead, calculated as percentages of land cost;

Long-term management and maintenance fund, calculated at $1 ,450 per acre;

vi. NFWF fees to establish a project-specific account; manage the sub-account for acquisition and initial site work; and manage the sub-account for long term management and maintenance.

Phasing of Security Payment: Compensatory Mitigation Land Security may be phased according to phasing of the project's approval and construction. Phasing of compensation funding shall be based upon land disturbance and habit impacts for each project phase. Phasing of the mitigation payment is described further in staff's recommended Condition of Certification **BIO-31** (most recent revision, below).

The project owner may elect to comply with some or all of the requirements in this condition by providing funds to implement the requirements into the Renewable Energy Action Team (REAT) Account established with the National Fish and Wildlife Foundation (NFWF). To use this option, the Project owner must make an initial deposit to the REAT Account in an amount equal to the estimated costs of implementing the requirement (as set forth in the Security section of this condition, paragraph 3, above). If the actual cost of the acquisition, initial protection and habitat improvements, longterm funding or other cost is more than the estimated amount initially paid by the project owner, the project owner shall make an additional deposit into the REAT Account sufficient to cover the actual acquisition costs, the actual costs of initial protection and habitat improvement on the compensation lands, the long-term funding requirements as established in an approved PAR or PAR-like analysis, or the other actual costs that are

estimated in the table. If those actual costs or PAR projections are less than the amount initially transferred by the ~~applicant~~project owner, the remaining balance shall be returned to the project owner.

4. The responsibility for acquisition of compensation lands may be delegated to a third party other than NFWF, such as a nongovernmental organization supportive of desert habitat conservation, by written agreement of the Energy Commission. Such delegation shall be subject to approval by the CPM, in consultation with CDFG, BLM and USFWS, prior to land acquisition, enhancement or management activities. Agreements to delegate land acquisition to an approved third party, or to manage compensation lands~~,~~ shall be executed and implemented within 18 months ~~of the Energy Commission's certification of the project~~after start of Pre-Construction Site Mobilization.
5. The project owner may request the CPM to provide it with all available information about any funds held by the Energy Commission, CDFG, or NFWF as project security, or funds held in a NFWF sub-account for this project, or other project-specific account held by a third party. The CPM shall also fully cooperate with any independent audit that the project owner may choose to perform on any of these funds.

Verification: The project owner shall provide the CPM with written notice of intent to start ground disturbance at least 30 days prior to ~~the start of ground-disturbing activities on the project site~~Pre-Construction Site Mobilization.

If the mitigation actions required under this condition are not completed at least 30 days prior to ~~the start of ground-disturbing activities~~any phase of Pre-Construction Site Mobilization, the Project owner shall provide verification to the CPM and CDFG that an approved Security for such phase has been established in accordance with this condition of certification no later than 30 days prior ~~to beginning Project ground-disturbing activities~~Pre-Construction Site Mobilization of the phase. Financial assurance can be provided to the CPM in the form of an irrevocable letter of credit, a pledged savings account or another form of security ("Security"). Prior to submitting the Security to the CPM, the project owner shall obtain the CPM's approval, in consultation with CDFG, BLM and the USFWS, of the form of the Security. The project owner, or an approved third party, shall complete and provide written verification to the CPM, CDFG, BLM and USFWS of the compensation lands acquisition and transfer within 18 months of the start of ~~Project ground-disturbing activities~~Pre-Construction Site Mobilization.

No later than 12 months after the start of any phase of ~~ground-disturbing project activities~~Pre-Construction Site Mobilization, the project owner shall submit a formal acquisition proposal to the CPM describing the parcels intended for purchase, and shall obtain approval from the CPM, in consultation with CDFG, BLM and USFWS, prior to

the acquisition. If NFWF or another approved third party is handling the acquisition, the project owner shall fully cooperate with the third party to ensure the proposal is submitted within this time period. The project owner or an approved third party shall complete the acquisition and all required transfers of the compensation lands, and provide written verification to the CPM, CDFG, BLM and USFWS of such completion, no later than 18 months after the ~~issuance of the Energy Commission Decision~~start of Pre-Construction Site Mobilization. If NFWF or another approved third party is being used for all or part of the acquisition, the project owner shall ensure that funds needed to accomplish the acquisition are transferred in timely manner to facilitate the planned acquisition and to ensure the land can be acquired and transferred prior to the 18-month deadline.

The project owner shall complete and submit to the CPM a PAR or PAR-like analysis no later than 60 days after the CPM approves compensation lands for acquisition associated with any phase of construction. The project owner shall fully fund the required amount for long-term maintenance and management of the compensation lands for that phase of construction no later than 30 days after the CPM approves a PAR or PAR-like analysis of the anticipated long-term maintenance and management costs of the compensation lands. Written verification shall be provided to the CPM and CDFG to confirm payment of the long-term maintenance and management funds.

No later than 60 days after the CPM determines what activities are required to provide for initial protection and habitat improvement on the compensation lands for any phase of construction, the project owner shall make funding available for those activities and provide written verification to the CPM of what funds are available and how costs will be paid. Initial protection and habitat improvement activities on the compensation lands for that phase of construction shall be completed, and written verification provided to the CPM, no later than six months after the CPM's determination of what activities are required on the compensation lands.

The project owner, or an approved third party, shall provide the CPM, CDFG, BLM and USFWS with a management plan for the compensation lands associated with any phase of construction within180 days of the land or easement purchase, as determined by the date on the title. The CPM, in consultation with CDFG, BLM and the USFWS, shall approve the management plan after its content is acceptable to the CPM.

Within 90 days after completion of ~~all~~ project ~~related ground disturbance~~construction, the project owner shall provide to the CPM, CDFG, BLM and USFWS an analysis, based on aerial photography, with the final accounting of the amount of habitat disturbed during Project construction. If this analysis shows that more lands were disturbed than was anticipated in this condition, the project owner shall provide the Energy

Commission with additional compensation lands and funding commensurate with the added impacts and applicable mitigation ratios set forth in this condition. A final analysis of all project related ground disturbance may not result in a reduction of compensation requirements if the deadlines established under this condition for transfer of compensation lands and funding have passed prior to completion of the analysis.

RAVEN MONITORING, MANAGEMENT, AND CONTROL PLAN

BIO-18 The project owner shall design and implement a Raven Monitoring, Management, and Control Plan (Raven Plan) that is consistent with the most current USFWS-approved raven management guidelines and that meets the approval of the USFWS, CDFG, and the CPM. Any subsequent modifications to the approved Raven Plan shall be made only with approval of the CPM in consultation with USFWS and CDFG. The Raven Plan shall include but not be limited to a program to monitor increased raven presence in the Project vicinity and to implement raven control measures as needed based on that monitoring. The purpose of the plan is to avoid any Project-related increases in raven numbers during construction, operation, and decommissioning. The threshold for implementation of raven control measures shall be any increases in raven numbers from baseline conditions, as detected by monitoring to be proposed in the Raven Plan. Regardless of raven monitoring results, the project owner shall be responsible for all other aspects of the Raven Plan, including avoidance and minimization of project-related trash, water sources, or perch/roost sites that could contribute to increased raven numbers. In addition, to offset the cumulative contributions of the Project to desert tortoise from increased raven numbers, the Project owner shall also contribute to the USFWS Regional Raven Management Program. The Project owner shall do all of the following:

1. Prepare and Implement a Raven Management Plan that includes the following:

   Identify conditions associated with the Project that might provide raven subsidies or attractants;

   Describe management practices to avoid or minimize conditions that might increase raven numbers and predatory activities;

   Describe control practices for ravens;

   Address monitoring and nest removal during construction and for the life of the Project, and;

   e. Discuss reporting requirements.

2. Contribute to the USFWS Regional Raven Management Program. The project owner shall submit payment to the project sub-account of the REAT Account held by the National Fish and Wildlife Foundation (NFWF) to support the USFWS Regional Raven Management Program. The amount shall be a one-time payment of $105 per acre of permanent disturbance (totaling $484,470). Payment may be made in phases corresponding to proposed phasing of the project described in Condition of Certification **BIO-31.**

Verification: No later than 30 days prior to ~~the start of construction~~Pre-Construction Site Mobilization, the project owner shall provide written verification to the CPM that NFWF has received and accepted payment into the project's sub-account of the REAT Account to support the USFWS Regional Raven Management Program.

No later than 30 days prior to ~~any construction-related ground disturbance activities~~Pre-Construction Site Mobilization, the Project owner shall provide the CPM, USFWS, and CDFG with the final version of a Raven Plan. All modifications to the approved Raven Plan shall be made only with approval of the CPM in consultation with USFWS and CDFG.

Within 30 days after completion of Project construction, the Project owner shall provide to the CPM for review and approval, a written report identifying which items of the Raven Plan have been completed, a summary of all modifications to mitigation measures made during the Project's construction phase, and which items are still outstanding.

On January 31st of each year following construction the Designated Biologist shall provide a report to the CPM that includes: a summary of the results of raven management and control activities for the year; a discussion of whether raven control and management goals for the year were met; and recommendations for raven management activities for the upcoming year.

PRE-CONSTRUCTION NEST SURVEYS AND IMPACT AVOIDANCE MEASURES FOR MIGRATORY BIRDS

BIO-19 Pre-construction nest surveys shall be conducted each year during the construction phase of the project if construction activities will occur during the breeding period (from January 1 through August 1). The Designated Biologist or Biological Monitor conducting the surveys shall be experienced bird surveyors who have demonstrated experience conducting nest searches; are knowledgeable of the nesting habitats of species that may nest on the site; and are familiar with standard nest-locating techniques such as those described in Martin and Guepel (1993). Surveys shall be conducted in

accordance with the following guidelines. Nothing in this condition requires the project owner to conduct burrowing owl surveys by entering private lands adjacent to the project site when the project owner has made reasonable attempts to obtain permission to enter the property for survey work but was unable to obtain such permission. In this situation only, the project owner may substitute binocular surveys for protocol field surveys.

Surveys shall cover all potential nesting habitat in the project site and within 500 feet of the boundaries of the plant site and linear facilities;

At least two pre-construction 100-percent coverage surveys shall be conducted of each ~~proposes~~proposed construction area, separated by a minimum 10-day interval. One of the surveys shall be conducted within the 10 days preceding initiation of construction activity. Additional follow-up surveys may be required if periods of construction inactivity exceed one week in any given area, an interval during which birds may establish a nesting territory and initiate egg laying and incubation; If active nests are detected during the survey, a 500 foot no-disturbance buffer zone shall be implemented and a monitoring plan shall be developed. This protected area surrounding the nest may be adjusted by the Designated Biologist in consultation with CDFG, BLM, USFWS, and CPM. Nest locations shall be mapped using GPS technology and the location data provided in completion reports (below) to the CPM and BLM Wildlife Biologist; and

The Designated Biologist shall monitor the nest until he or she determines that nestlings have fledged and dispersed. Monitoring shall avoid disturbing the nests or causing an increased risk of predation. Activities that might, in the opinion of the Designated Biologist and in consultation with the CPM and BLM, disturb nesting activities shall be prohibited within the buffer zone until such a determination is made.

Verification: Upon completion of the surveys, and prior to initiating any vegetation removal or ground-disturbing activities (i.e., no more than 10 days prior to the start of such activities), the project owner shall provide the CPM and BLM a letter-report describing the methods and findings of the pre-construction nest surveys, including the time, date, and duration of the survey; identity and qualifications of the surveyor(s); and a list of species observed. If active nests are detected during the survey, the report shall include a map or aerial photo identifying the location of the nest and shall depict the boundaries of the no-disturbance buffer zone around the nest.

PRE-CONSTRUCTION SURVEYS FOR GOLDEN EAGLES

BIO-20 The Project owner shall implement the following measures to avoid or minimize Project-related construction impacts to golden eagles.

Annual Inventory During Construction. For each calendar year during which construction will occur an inventory shall be conducted to determine if golden eagle territories occur within one mile of the Project boundaries. Survey methods and surveyor qualifications for the inventory shall be as described in the Interim Golden Eagle Inventory and Monitoring Protocols; and Other Recommendations (Pagel et al. 2010) or more current guidance from the USFWS.

Inventory Data: Data collected during the inventory shall include at least the following: territory status (unknown, vacant, occupied, breeding successful, breeding unsuccessful); nest location, nest elevation; age class of golden eagles observed; nesting chronology; number of young at each visit; digital photographs; and substrate upon which nest is placed.

Determination of Unoccupied Territory Status: A nesting territory or inventoried habitat shall be considered unoccupied by golden eagles only after completing at least two full surveys in a single breeding season.

Monitoring and Adaptive Management Plan: If an occupied nest[2] is detected within one mile of the Project boundaries, the Project owner shall prepare and implement a Golden Eagle Monitoring and Management Plan for the duration of construction to ensure that Project construction activities do not result in injury or disturbance to golden eagles. The monitoring methods shall be consistent with those described in the Interim Golden Eagle Inventory and Monitoring Protocols; and Other Recommendations (Pagel et al. 2010) or more current guidance from the USFWS. The Monitoring and Management Plan shall be prepared in consultation with the USFWS. Triggers for adaptive management shall include any evidence of Project-related disturbance to nesting golden eagles, including but not limited to: agitation behavior (displacement, avoidance, and defense); increased vigilance behavior at nest sites; changes in foraging and feeding behavior, or nest site abandonment. The monitoring and Management Plan shall include a description of adaptive management actions, which shall include, but not be limited to, cessation of construction activities that are deemed by the Designated Biologist to be the source of golden eagle disturbance.

Verification: No later than 30 days after completion of the golden eagle inventory the project owner shall submit a report to the CPM, CDFG, and USFWS documenting the results of the inventory.

If an occupied nest is detected within one mile of the Project boundary during the inventory, the Project owner shall contact staff at the USFWS Ventura Office and CDFG within one working day of detection of the nest for interim guidance on monitoring and nest protection. The project owner shall provide the CPM, CDFG, and USFWS with the final version of the Golden Eagle Monitoring and Management Plan within 30 days after

detection of the nest. This final Plan shall have been reviewed and approved by the CPM in consultation with USFWS and CDFG.

BURROWING OWL IMPACT AVOIDANCE AND MINIMIZATION MEASURES

BIO-21 The Project owner shall implement the following measures to avoid, minimize and offset impacts to burrowing owls. Nothing in this condition requires the project owner to conduct burrowing owl surveys by entering private lands adjacent to the project site when the project owner has made reasonable attempts to obtain permission to enter the property for survey work but was unable to obtain such permission. In this situation only, the project owner may substitute binocular surveys for protocol field surveys.

Pre-Construction Surveys. The Designated Biologist or Biological Monitor shall conduct pre-construction surveys for burrowing owls ~~no more than 30 days prior to initiation of construction activities~~. Surveys shall be focused exclusively on detecting burrowing owls, and shall be conducted from two hours before sunset to one hour after or from one hour before to two hours after sunrise. The survey area shall include the Project Disturbance Area and surrounding 500-foot survey buffer.

Implement Avoidance Measures. If an active burrowing owl burrow is detected within 500 feet from the Project Disturbance Area the following avoidance and minimization measures shall be implemented:

Establish Non-Disturbance Buffer. Fencing shall be installed at a 250-foot radius from the occupied burrow to create a non-disturbance buffer around the burrow. The non-disturbance buffer and fence line may be reduced to 160 feet if all Project-related activities that might disturb burrowing owls would be conducted during the non-breeding season (September 1st through January 31st) . Signs shall be posted in English and Spanish at the fence line indicating no entry or disturbance is permitted within the fenced buffer.

Monitoring: If construction activities would occur within 500 feet of the occupied burrow during the nesting season (February 1 – August 31st) the Designated Biologist or Biological Monitor shall monitor to determine if these activities have potential to adversely affect nesting efforts, and shall implement measures to minimize or avoid such disturbance.

3. Passive Relocation of Burrowing Owls. If pre-construction surveys indicate the presence of burrowing owls within the Project Disturbance Area (the Project Disturbance Area means all lands disturbed in the construction and operation of the

~~Genesis~~Calico Project), the Project owner shall prepare and implement a Burrowing Owl Relocation and Mitigation Plan, in addition to the avoidance measures described above. The final Burrowing Owl Relocation and Mitigation Plan shall be approved by the CPM, in consultation with USFWS, BLM and CDFG, and shall:

a. Identify and describe suitable relocation sites within 1 mile of the Project Disturbance Area, and describe measures to ensure that burrow installation or improvements would not affect sensitive species habitat or existing burrowing owl colonies in the relocation area;

Provide guidelines for creation or enhancement of at least two natural or artificial burrows per relocated owl, including a discussion of timing of burrow improvements, specific location of burrow installation, and burrow design. Design of the artificial burrows shall be consistent with CDFG guidelines (CDFG 1995) and shall be approved by the CPM in consultation with CDFG, BLM and USFWS;

Passive relocation sites shall be in areas of suitable habitat for burrowing owl nesting, and be characterized by minimal human disturbance and access. Relative cover of non-native plants within the proposed relocation sites shall not exceed the relative cover of non-native plants in the adjacent habitats;

d. Provide detailed methods and guidance for passive relocation of burrowing owls occurring within the Project Disturbance Area; and

4. Acquire Compensatory Mitigation Lands for Burrowing Owls. The following measures for compensatory mitigation shall apply only if burrowing owls ~~that~~ are detected within the Project Disturbance Area. The Project owner shall acquire, in fee or in easement, 19.5 acres of land for each burrowing owl that is displaced by construction of the Project. This compensation acreage of 19.5 acres per single bird or pair of nesting owls assumes that there is no evidence that the compensation lands are occupied by burrowing owls. If burrowing owls are observed to occupy the compensation lands, then only 9.75 acres per single bird or pair is required, per CDFG (1995) guidelines. If the compensation lands are contiguous to currently occupied habitat, then the replacement ratio will be 13.0 acres per pair or single bird. The Project owner shall provide funding for the enhancement and long-term management of these compensation lands. The acquisition and management of the compensation lands may be delegated by written agreement to CDFG or to a third party, such as a nongovernmental organization dedicated to habitat conservation, subject to approval by the CPM, in consultation with CDFG and USFWS prior to land acquisition or management activities. Additional funds shall be based on the adjusted market value of

compensation lands at the time of construction to acquire and manage habitat. In lieu of acquiring lands itself, the Project owner may satisfy the requirements of this condition by depositing funds into the Renewable Energy Action Team (REAT) Account established with the National Fish and Wildlife Foundation (NFWF), as described in Section 3.i. of Condition of Certification **BIO-17.**

Criteria for Burrowing Owl Mitigation Lands. The terms and conditions of this acquisition or easement shall be as described in Paragraph 1 of **BIO-17** [Desert Tortoise Compensatory Mitigation], with the additional criteria to include: 1) the mitigation land must provide suitable habitat for burrowing owls, and 2) the acquisition lands must either currently support burrowing owls or be within dispersal distance from an active burrowing owl nesting territory (generally approximately 5 miles). The burrowing owl mitigation lands may be included with the desert tortoise mitigation lands ONLY if these two burrowing owl criteria are met. If the burrowing owl mitigation land is separate from the acquisition required for desert tortoise compensation lands, the Project owner shall fulfill the requirements described below in this condition.

Security. If burrowing owl mitigation land is separate from the acreage required for desert tortoise compensation lands the Project owner or an approved third party shall complete acquisition of the proposed compensation lands prior to initiating ground-disturbing Project activities. Alternatively, financial assurance can be provided by the Project owner to the CPM with copies of the document(s) to CDFG, BLM and the USFWS, to guarantee that an adequate level of funding is available to implement the mitigation measure described in this condition. These funds shall be used solely for implementation of the measures associated with the Project. Financial assurance can be provided to the CPM in the form of an irrevocable letter of credit, a pledged savings account or another form of security ("Security") prior to initiating ground-disturbing Project activities. Prior to submittal to the CPM, the Security shall be approved by the CPM, in consultation with CDFG, BLM and the USFWS to ensure funding. The estimated costs of enhancement and endowment are discussed in condition **BIO-17.** The final amount due will be determined by the PAR analysis conducted pursuant to **BIO-17.**

Verification: If pre-construction surveys detect burrowing owls within 500 feet of proposed construction activities, the Designated Biologist shall provide to the CPM, BLM, CDFG and USFWS documentation indicating that non-disturbance buffer fencing has been installed at least 10 days prior to the start of ~~any construction-related ground disturbance activities~~Pre-Construction Site Mobilization. The Project owner shall report monthly to the CPM, CDFG, BLM and USFWS for the duration of construction on the implementation of burrowing owl avoidance and minimization

measures. Within 30 days after completion of construction the Project owner shall provide to the CPM, BLM, CDFG and USFWS a written construction termination report identifying how mitigation measures described in the plan have been completed.

If pre-construction surveys detect burrowing owls within the Project Disturbance Area, the Project owner shall notify the CPM, BLM, CDFG and USFWS no less than 10 days of completing the surveys that a relocation of owls is necessary. The Project owner shall do all of the following if relocation of one or more burrowing owls is required:

Within 30 days of completion of the burrowing owl pre-construction surveys, submit to the CPM, CDFG and USFWS a Burrowing Owl Relocation and Mitigation Plan.

No less than 90 days prior to acquisition of the burrowing owl compensation lands, the Project owner, or an approved third party, shall submit a formal acquisition proposal to the CPM, CDFG, and USFWS describing the 39-acre parcel intended for purchase. At the same time the Project owner shall submit a PAR or PAR-like analysis for the parcels for review and approval by the CPM, CDFG and USFWS.

Within 90 days of the land or easement purchase, as determined by the date on the title, the Project owner shall provide the CPM with a management plan for review and approval, in consultation with CDFG, BLM and USFWS, for the compensation lands and associated funds.

No later than 30 days prior to the start of ~~construction-related ground disturbing activities~~any phase of Pre-Construction Site Mobilization, the Project owner shall provide written verification of Security for such phase in accordance with this condition of certification.

No later than 18 months after ~~the start of construction-related ground disturbance activities~~Pre-Construction Site Mobilization, the Project owner shall provide written verification to the CPM, BLM, CDFG and USFWS that the compensation lands or conservation easements have been acquired and recorded in favor of the approved recipient.

On January 31st of each year following construction for a period of five years, the Designated Biologist shall provide a report to the CPM, USFWS, BLM and CDFG that describes the results of monitoring and management of the burrowing owl

relocation area. The annual report shall provide an assessment of the status of the relocation area with respect to burrow function and weed infestation, and shall include recommendations for actions the following year for maintaining the burrows as functional burrowing owl nesting sites and minimizing the occurrence of weeds.

AVIAN PROTECTION PLAN / MONITORING BIRD IMPACTS FROM SOLAR TECHNOLOGY

BIO-22 The project owner shall prepare and implement an Avian and Bat Protection Plan to monitor bird and bat collisions with facility features (study described below). The Project owner shall use the monitoring data to inform and develop an adaptive management program that would avoid and minimize Project-related avian and bat impacts. Project-related bird and bat deaths or injuries shall be reported to the CPM, CDFG and USFWS. The CPM, in consultation with CDFG and USFWS, shall determine if the Project-related bird or bat deaths or injuries warrant implementation of adaptive management measures contained in the Avian and Bat Protection Plan. The study design for the Avian and Bat Protection Plan shall be approved by the CPM in consultation with CDFG and USFWS, and, once approved, shall be incorporated into the project's BRMIMP and implemented. The Plan shall include adaptive management strategies that include the placement of bird flight diverters, aerial markers, or other strategies to minimize collisions with the SunCatcher units.

The Avian and Bat Protection Plan shall include a Bird Monitoring Study to monitor the death and injury of birds and bats from collisions with facility features such as reflective mirror-like surfaces and from heat, and bright light from concentrating sunlight. The study design shall be approved by BLM's Wildlife Biologist and the CPM in consultation with CDFG and USFWS, and shall be incorporated into the project's BRMIMP and implemented. The Bird Monitoring Study shall be based upon prior studies by McCrary et al. (1986) or other applicable literature including the Region 8 Interim Guidelines for the Development of a Project-Specific Avian and Bat Protection Plan for Solar Energy Plants and Related Transmission Facilities (USFWS 2010), and shall include detailed specifications on data and carcass collection protocol and a rationale justifying the proposed schedule of carcass searches. The study shall also include seasonal trials to assess bias from carcass removal by scavengers as well as searcher bias and proposed disposition of dead or injured birds.

Verification: ~~No more than 30 days following the publication of the Energy Commission License Decision or BLM's Record of Decision/ROW Issuance, whichever comes first~~At least 30 days prior to Pre-Construction Site Mobilization, the project owner shall submit to

the CPM, BLM's Wildlife Biologist, USFWS and CDFG a final Avian Protection Plan. Modifications to the Avian Protection Plan shall be made only after approval from BLM's Wildlife Biologist and the CPM.

For one year following the beginning of ~~power plant~~SunCatcher operation, the Designated Biologist shall submit quarterly reports to BLM's Wildlife Biologist , CPM, CDFG, and USFWS describing the methods, dates, durations, and results of monitoring. The quarterly reports shall provide a detailed description of any project-related bird or wildlife deaths or injuries detected during the monitoring study or at any other time. Following the completion of the fourth quarter of monitoring the Designated Biologist shall prepare an Annual Report that summarizes the year's data, analyzes any project-related bird fatalities or injuries detected, and provides recommendations for future monitoring and any adaptive management actions needed. The Annual Report shall be provided to the CPM, BLM's Wildlife Biologist, CDFG, and USFWS. Quarterly reporting shall continue until BLM's Wildlife Biologist and the CPM, in consultation with CDFG and USFWS determine whether more years of monitoring are needed, and whether mitigation and adaptive management measures are necessary. After the Bird Monitoring Study is determined by BLM's Wildlife Biologist and the CPM to be complete, the project owner or contractor shall prepare a paper that describes the study design and monitoring results to be submitted to the CPM, BLM's Wildlife Biologist, CDFG, USFWS, and a peer-reviewed scientific journal. Proof of submittal shall be provided to BLM's Wildlife Biologist and the CPM within one year of concluding the monitoring study.

NELSON'S BIGHORN SHEEP MITIGATION

BIO-23 The Designated Biologist or Biological Monitor shall be responsible for daily binocular scans of the project area and surrounding hills and bajadas to search for Nelson's bighorn sheep. At any time bighorn sheep are seen within ~~2000~~2,000 feet of any active construction site, the Designated Biologist or Biological Monitor shall monitor their activity until the animals leave the area. If the bighorn sheep approach within 500 feet of any active construction site, then construction shall cease until the animals have moved farther than 500 feet away from construction activities, even if construction is occurring within an area that had been fenced with tortoise exclusion fencing. This buffer may be modified with the approval of the CPM, and BLM, ~~and~~in consultation with CDFG. In addition, the project owner shall provide resource agency staff and private conservation foundation staff and volunteers permanent access to the Cady Mountains via Hector Road or another suitable route for any activities related to Nelson's bighorn sheep monitoring or management.

Verification: Impact minimization measures and implementation methods for Nelson's bighorn sheep and their implementation methods shall be included in the final BRMIMP and implemented during construction and operation of the project. Implementation of the measures shall be reported in the Monthly Compliance Reports by the Designated Biologist.

AMERICAN BADGER AND DESERT KIT FOX IMPACT AVOIDANCE AND MINIMIZATION MEASURES

BIO-24 Prior to ground disturbance the project owner shall conduct pre-construction surveys for American badgers and desert kit fox. These surveys may be conducted concurrent with the desert tortoise surveys. Surveys shall be conducted as described below:

Biological Monitors shall perform pre-construction surveys for badger and kit fox dens in the project area, including areas within 90 feet of all project facilities, utility corridors, and access roads. If dens are detected, each den shall be classified as inactive, potentially active, or definitely active.

Inactive dens that would be directly impacted by construction activities shall be excavated by hand and backfilled to prevent reuse by badgers or kit fox. Potentially active dens that would be directly impacted by construction activities shall be monitored by the Biological Monitor for three consecutive nights using a tracking medium (such as diatomaceous earth or fire clay) and/or infrared camera stations at the entrance. If no tracks are observed in the tracking medium or no photos of the target species are captured after three nights, the den shall be excavated and backfilled by hand.

Occupied badger dens shall be flagged and ground-disturbing activities avoided within 50 feet of the occupied den. Maternity dens shall be avoided during the pup-rearing season (15 February through 1 July) and a minimum 200-foot disturbance-free buffer established. Buffers may be modified with the concurrence of CDFG and CPM. Maternity dens shall be flagged for avoidance, identified on construction maps, and a biological monitor shall be present during construction.

If avoidance of a non-maternity den is not feasible, badgers shall be relocated or allowed to escape the project area (e.g., by providing a temporary monitored opening in the tortoise exclusion fence and directing the animal toward the opening with temporary plastic construction fencing). If necessary, dens will be slowly excavated (either by hand or mechanized equipment under the direct supervision of the biologist, removing no more that

4 inches at a time) before or after the rearing season (15 February through 1 July). Any relocation of badgers shall occur only after consultation with the CDFG and CPM. A written report documenting the badger removal shall be provided to the CPM within 30 days of relocation. In the event that passive relocation techniques fail for badgers, the ~~Applicant~~Project owner will contact CDFG to explore other relocation options, which may include trapping.

Verification: The project owner shall submit a report to the CPM, BLM, and CDFG within 30 days of completion of badger and kit fox surveys. The report shall describe survey methods, results, mitigation measures implemented, and the results of the mitigation.

BAT IMPACT AVOIDANCE AND MINIMIZATION MEASURES

BIO-25 The project owner shall conduct a survey for roosting bats prior to any ground disturbance activities in all areas within 200 feet of rocky outcrops or the existing BNSF railroad trestles. The project owner shall also conduct surveys for roosting bats during the maternity season (1 March to 31 July) within 300 feet of project activities at the existing railroad trestles and rocky outcrops. These areas shall be surveyed by a qualified bat biologist, who shall be approved by the Designated Biologist. Surveys shall include a minimum of one day and one evening visit. If active maternity roosts or hibernacula are found, the rock outcrop or trestle occupied by the roost shall be avoided (i.e., not removed) by the project, if feasible. If avoidance of the maternity roost is not feasible, the bat biologist shall survey (through the use of radio telemetry or other CDFG/CPM/BLM-approved methods) for nearby alternative maternity colony sites. If the bat biologist determines in consultation with and with the approval of the CDFG, BLM's Wildlife Biologist, and CPM that there are alternative roost sites used by the maternity colony and young are not present, then no further action is required. However, if there are no alternative roost sites used by the maternity colony, provision of substitute roosting bat habitat is required. If active maternity roosts are absent, but a hibernaculum (i.e., a non-maternity roost) is present, then exclusion of bats prior to demolition of roosts is required.

1. Provision of substitute roosting bat habitat. If a maternity roost will be impacted by the project, and no alternative maternity roosts are in use within 1 mile of the site, substitute roosting habitat for the maternity colony shall be provided on, or in close proximity to, the project site no less than three months prior to the eviction of the colony. Alternative roost sites will be constructed in accordance with the specific bats' requirements in coordination with CDFG, BLM's Wildlife Biologist, and the CPM. Alternative roost sites must be of comparable size and proximal

in location to the impacted colony. The CDFG shall also be notified of any hibernacula or active nurseries within the construction zone.

2. Exclude bats prior to demolition of roosts. If non-breeding bat hibernacula are found in rocky outcrops scheduled to be removed or in crevices in rock outcrops within the grading footprint, the individuals shall be safely evicted, according to timing and under the direction of the qualified bat biologist, by opening the roosting area to allow airflow through the cavity or other means determined appropriate by the bat biologist (e.g., installation of one-way doors). In situations requiring one-way doors, a minimum of one week shall pass after doors are installed and temperatures should be sufficiently warm for bats to exit the roost. This action should allow all bats to leave during the course of one week. Roosts that need to be removed in situations where the use of one-way doors is not necessary in the judgment of the qualified bat biologist shall first be disturbed by various means at the direction of the bat biologist at dusk to allow bats to escape during the darker hours, and the roost tree shall be removed or the grading shall occur the next day (i.e., there shall be no less or more than one night between initial disturbance and the grading or tree removal).

   If an active maternity roost is located in an area to be impacted by the project, and alternative roosting habitat is available, the demolition of the roost site must commence before maternity colonies form (i.e., prior to 1 March) or after young are flying (i.e., after 31 July) using the exclusion techniques described above.

Verification: The project owner shall submit a report to the CPM, the BLM Wildlife Biologist, and the CDFG within 30 days of completion of roosting bat surveys and any subsequent mitigation. The report shall describe survey methods, results, mitigation measures implemented, and the results of the mitigation.

STREAMBED IMPACT MINIMIZATION AND COMPENSATION MEASURES

BIO-26 The project owner shall implement the following measures to avoid, minimize and mitigate for direct and indirect impacts to jurisdictional waters of the State and to satisfy requirements of California Fish and Game Code sections 1600 and 1607. Throughout this condition, “jurisdictional” refers to streambeds or acreages of streambed meeting CDFG criteria as waters of the State.

Section A: Acquire Off-Site State Waters.

The project owner shall acquire, in fee or in easement, a parcel or parcels of land ~~that includes no fewer than 152.3 acres of State jurisdictional waters. Prior to construction~~as state-jurisdictional streambed compensation acreage calculated at a ratio of 1:1 for waters of the State. The applicant shall map the vegetation with emphasis on desert wash, including microphyll woodland, communities within the drainages subject to project disturbance and provide a map to the CPM, CDFG and BLM. The parcel or parcels comprising the ~~152.3 acres of ephemeral washes~~state-jurisdictional streambed compensation acreage calculated at a 1:1 ratio shall include the same types of vegetation as mapped in the project footprint.

This compensation acreage may be included ("nested") within the acreage acquired and managed as desert tortoise habitat compensation (Condition of Certification **BIO-17)** only if:

Adequate acreage of qualifying state-jurisdictional streambed delineated within the desert tortoise compensation lands;

The desert tortoise habitat compensation lands are acquired and dedicated as permanent conservation lands within 18 months ~~of~~from the start of ~~project construction~~Pre-Construction Site Mobilization.

If these two criteria are not met, then the project owner shall provide no fewer than ~~152.3 acres of~~ state-jurisdictional streambed compensation ~~lands~~acreage calculated at the 1:1 ratio independent of any compensation land required under other conditions of certification (adjusted to reflect the final project footprint and expert's delineation of streambed on the compensation lands), and shall also provide funding for the initial improvement and long-term maintenance and management of the acquired lands, and to comply with other related requirements this condition. Costs of these requirements cannot be estimated in advance because jurisdictional streambed would make up only a small portion of any acquired parcel and might vary widely among available parcels. In general, however the total costs shall be based upon land acquisition and management costs as discussed in Condition of Certification **BIO-17** and shall include all associated costs as described in that Condition. This amount may be revised by the CPM in consultation with DFG, BLM and USFWS, based on further analysis of long-term management and maintenance costs. See **Biological Resources Addendum Tables 5** and **9.** The terms and conditions of this acquisition or easement shall be as described in Condition of Certification **BIO-17.** Mitigation for impacts to State waters shall occur within the surrounding watersheds, as close to the project site as possible.

The project owner may elect to comply with the requirements in this condition for acquisition of compensation lands, initial protection and habitat improvement on the compensation lands, or long-term maintenance and management of the compensation lands by funding, or any combination of these three requirements, by

providing funds to implement those measures into the Renewable Energy Action Team (REAT) Account established with the National Fish and Wildlife Foundation (NFWF). To use this option, the Project owner must make an initial deposit to the REAT Account in an amount equal to the estimated costs of implementing the requirement. If the actual cost of the acquisition, initial protection and habitat improvements, or longterm funding is more than the estimated amount initially paid by the project owner, the project owner shall make an additional deposit into the REAT Account sufficient to cover the actual acquisition costs, the actual costs of initial protection and habitat improvement on the compensation lands, or the long-term funding requirements as established in an approved PAR or PAR-like analysis. If those actual costs or PAR projections are less than the amount initially transferred by the ~~applicant~~project owner, the remaining balance shall be returned to the project owner.

The responsibility for acquisition of compensation lands may be delegated to a third party other than NFWF, such as a nongovernmental organization supportive of desert habitat conservation, by written agreement of the Energy Commission. Such delegation shall be subject to approval by the CPM, in consultation with CDFG, BLM and USFWS, prior to land acquisition, enhancement or management activities. Agreements to delegate land acquisition to an approved third party, or to manage compensation lands, shall be executed and implemented within 18 months of the Energy Commission's certification of the project.

Management Plan for Acquired Lands: The project owner shall prepare and submit to Energy Commission CPM and CDFG a draft Management Plan that reflects site-specific enhancement measures for the drainages on the acquired compensation lands. The objective of the Management Plan shall be to enhance the wildlife value of the drainages, and may include enhancement actions such as weed control, fencing to exclude livestock, or erosion control. Where applicable, the management plan should be integrated with desert tortoise compensation land habitat management planning requirements as described in **BIO-17.**

Section B: On-site Measures:

1. Copies of Requirements, Stop Work Authority: The project owner shall provide a copy of the Streambed Impact Minimization and Compensation Measures to all contractors, subcontractors, and the ~~applicant~~project owner's project supervisors. Copies shall be readily available at work sites at all times during periods of active work and must be presented to any CDFG personnel or personnel from another agency upon demand. The CPM reserves the right to issue a stop work order after giving notice to the project owner, if the CPM, in consultation with CDFG, determines that the project owner is not in compliance with any of the requirements of this condition, including but not limited to the existence of any of the following:

The information provided by the ~~applicant~~project owner regarding streambed alteration is incomplete or inaccurate;

New information becomes available that was not known to the Energy Commission at the time of project certification; or

c. The project or project activities as described in the Supplemental Staff Assessment/ Final Environmental Impact Statement have changed.

2. Best Management Practices: The project owner shall comply with the following conditions to protect drainages near the Project Disturbance Area:

The project owner shall not operate vehicles or equipment in ponded or flowing water except as described in this condition.

With the exception of the retention basins and drainage control system installed for the project the installation of bridges, culverts, or other structures shall be such that water flow (velocity and low flow channel width) is not impaired. Bottoms of temporary culverts shall be placed at or below stream channel grade.

When any activity requires moving of equipment across a flowing drainage, such operations shall be conducted without substantially increasing stream turbidity.

Vehicles driven across ephemeral drainages when water is present shall be completely clean of petroleum residue and water levels shall be below the vehicles' axels.

The project owner shall minimize road building, construction activities and vegetation clearing within ephemeral drainages to the extent feasible.

The project owner shall not allow water containing mud, silt, or other pollutants from grading, aggregate washing, or other activities to enter ephemeral drainages or be placed in locations that may be subjected to high storm flows.

The project owner shall comply with all litter and pollution laws. All contractors, subcontractors, and employees shall also obey these laws, and it shall be the responsibility of the project owner to ensure compliance.

Spoil sites shall not be located at least 30 feet from the boundaries and drainages or in locations that may be subjected to high storm flows, where spoils might be washed back into drainages.

i. Raw cement/concrete or washings thereof, asphalt, paint or other coating material, oil or other petroleum products, or any other substances that could be hazardous to vegetation or wildlife resources, resulting from project-related activities, shall be prevented from contaminating the soil and/or entering waters of the State. These materials, placed within or where they may enter a drainage by the project owner or any party working under contract or with the permission of the project owner, shall be removed immediately.

No broken concrete, debris, soil, silt, sand, bark, slash, sawdust, rubbish, cement or concrete or washings thereof, oil or petroleum products or other organic or

earthen material from any construction or associated activity of whatever nature shall be allowed to enter into, or placed where it may be washed by rainfall or runoff into, waters of the State.

When operations are completed, any excess materials or debris shall be removed from the work area. No rubbish shall be deposited within 150 feet of the high water mark of any drainage.

No equipment maintenance shall occur within 150 feet of any ephemeral drainage where petroleum products or other pollutants from the equipment may enter these areas under any flow.

Stationary equipment such as motors, pumps, generators, and welders, located within or adjacent to a drainage shall be positioned over drip pans. Stationary heavy equipment shall have suitable containment to handle a catastrophic spill/leak. Clean up equipment such as booms, absorbent pads, and skimmers, shall be on site prior to the start of construction.

n. The cleanup of all spills shall begin immediately. The CDFG, BLM Wildlife Biologist, and CPM shall be notified immediately by the project owner of any spills and shall be consulted regarding clean-up procedures.

Non-Native Vegetation Removal. The owner shall remove any nonnative vegetation (Consistent with the Weed Management Plan, see Condition of Certification **BIO-1 1)** from any on-site portion of any drainage that requires the placement of a bridge, culvert or other structure. Removal shall be done at least twice annually (Spring/Summer) throughout the life of the Project.

Reporting of Special-Status Species: If any special-status species are observed on or in proximity to the project site, or during project surveys, the project owner shall submit California Natural Diversity Data Base (CNDDB) forms and maps to the CNDDB within five working days of the sightings and provide the regional CDFG office with copies of the CNDDB forms and survey maps. The CNDDB form is available online at: www.dfg.ca.gov/whdab/pdfs/natspec.pdf. This information shall be mailed within five days to: California Department of Fish and Game, Natural Diversity Data Base, 1807 1 3th Street, Suite 202, Sacramento, CA 95814, (916) 324-3812. A copy of this information shall also be mailed within five days to CDFG, BLM Wildlife Biologist, and the CPM.

5. Notification: Prior to any activities that cross or have the potential to impact any jurisdictional drainage, the project owner shall provide a detailed map to the CDFG, BLM's Wildlife Biologist, and CPM in a GIS format that identifies all potential crossings of jurisdictional habitats including retention basins, detention basins, reconfigured channels and culverts. The maps shall identify the type of crossing proposed by the owner such as bridges, culverts, or other mechanism and the best management practices that would be employed. The project owner shall notify the CPM, BLM's Wildlife Biologist, and CDFG, in writing, at least five days prior to initiation of project activities in jurisdictional areas and at least five days prior to

completion of project activities in jurisdictional areas. The project owner shall notify the CPM, BLM Wildlife Biologist, and CDFG of any change of conditions to the project, the jurisdictional impacts, or the mitigation efforts, if the conditions at the site of the proposed project change in a manner which changes risk to biological resources that may be substantially adversely affected by the proposed project. The notifying report shall be provided to the CPM, BLM's Wildlife Biologist, and CDFG no later than 7 days after the change of conditions is identified. As used here, change of condition refers to the process, procedures, and methods of operation of a project; the biological and physical characteristics of a project area; or the laws or regulations pertinent to the project, as described below. A copy of the notifying change of conditions report shall be included in the annual reports.

Biological Conditions: a change in biological conditions includes, but is not limited to, the following: 1) the presence of biological resources within or adjacent to the project area, whether native or non-native, not previously known to occur in the area; or 2) the presence of biological resources within or adjacent to the project area, whether native or non-native, the status of which has changed to endangered, rare, or threatened, as defined in section 15380 of Title 14 of the California Code of Regulations.

Physical Conditions: a change in physical conditions includes, but is not limited to, the following: 1) a change in the morphology of a river, stream, or lake, such as the lowering of a bed or scouring of a bank, or changes in stream form and configuration caused by storm events; 2) the movement of a river or stream channel to a different location; 3) a reduction of or other change in vegetation on the bed, channel, or bank of a drainage, or 4) changes to the hydrologic regime such as fluctuations in the timing or volume of water flows in a river or stream.

c. Legal Conditions: a change in legal conditions includes, but is not limited to, a change in Regulations, Statutory Law, a Judicial or Court decision, or the listing of a species, the status of which has changed to endangered, rare, or threatened, as defined in section 15380 of Title 14 of the California Code of Regulations.

Verification: No fewer than 30 days prior to the start of ~~any site or related facilities mobilization activities~~Pre-Construction Site Mobilization, the project owner shall implement the mitigation measures described in this condition. No fewer than 30 days prior to the start of work potentially affecting waters of the State, the project owner shall provide written verification (i.e., through incorporation into the BRMIMP) to the CPM and BLM's Wildlife Biologist that the above best management practices will be implemented and provide a discussion of work in waters of the State in Compliance Reports for the duration of the project.

Within 30 days after ~~completion of~~ the first ~~year of project construction~~anniversary of Pre-Construction Site Mobilization , the project owner shall provide to the CPM for review and approval a report identifying that appropriate mitigation lands have

been obtained, verification of the acreage of state jurisdictional streambeds on the compensation lands (to be delineated using methodology identical to the delineation of on-site jurisdictional streambeds and using the most current CDFG guidelines for delineation of state waters), a draft Management Plan for review and approval by the CPM and CDFG, and verification on ongoing enhancement techniques, and a summary of all modifications made to the existing channels on the project site.

EVAPORATION POND DESIGN, MONITORING, AND MANAGEMENT PLAN

BIO-27 The project owner shall install netting over the evaporation ponds and design and implement an Evaporation Pond Design, Monitoring, and Management Plan (Evaporation Pond Plan) to be based upon the draft Evaporation Pond Plan submitted by the ~~applicant~~project owner. The Plan shall meet the approval of ~~the USFWS, CDFG,~~ BLM's Wildlife Biologist, and the CPM in consultation with USFWS and CDFG. The goal of the Evaporation Pond Plan shall be to avoid the potential for wildlife mortality associated with the evaporation ponds. The Evaporation Pond Plan shall include: a discussion of the objectives of the Evaporation Pond Plan; a description of project design features such as side slope specifications, freeboard and depth requirements, covering, and fencing; a discussion on the placement of the evaporation pond as to reduce the potential of collision or electrocution of wildlife near the transmission line; avian, pond, and water quality monitoring for selenium and other Title 20 compounds, management actions such as bird deterrence/hazing and water level management, triggers for those management actions; and annual reporting requirements.

Verification: At least 30 days prior to start of any ~~project-related ground disturbance activities~~Pre-Construction Site Mobilization, the project owner shall provide the CPM, BLM's Wildlife Biologist, USFWS, and CDFG with the final version of the Evaporation Pond Plan that has been reviewed and approved by BLM and the CPM in consultation with USFWS~~,~~ and CDFG~~, and staff~~. The CPM and BLM's Wildlife Biologist would determine the plan's acceptability within 15 days of receipt of the final plan. All modifications to the approved Evaporation Pond Plan must be made only after consultation the staff, USFWS, and CDFG. The project owner shall notify the CPM and BLM's Wildlife Biologist no less than 5 working days before implementing any BLM- and CPM-approved modifications to the Evaporation Pond Plan.

Within 30 days after completion of evaporation pond construction, the project owner shall provide to the CPM for review and approval a report identifying which items of the Evaporation Pond Plan have been completed, a summary of all modifications to mitigation measures made during the project's construction phase, and as-built

drawings of the evaporation ponds. Throughout the life of the project, the project owner shall provide annual reports on results of the previous year's evaporation plan monitoring, including but not limited to description and summary of wildlife mortality, water quality, and management actions taken or proposed.

CHANNEL DECOMMISSIONING AND RECLAMATION PLAN

BIO-28 Upon project closure, the project owner shall implement a final Decommissioning and Reclamation Plan to remove ~~the~~any engineered diversion channels, detention basins, and other sediment control features from the project site. The goal of the plan shall be to restore the site's topography and hydrology to a relatively natural condition and to establish native plant communities within the Project Disturbance Area. The Channel Decommissioning and Reclamation Plan shall include a cost estimate for implementing the proposed decommissioning and reclamation activities. The plan and cost estimate shall be consistent with the guidelines in BLM's 43 CFR 3809.550 et seq., subject to review and revisions from BLM's Wildlife Biologist and the CPM in consultation with USFWS and CDFG.

Verification: ~~No less than 90 days from publication of the Energy Commission Decision or the Record of Decision, whichever comes first~~At least 160 days prior to initiation of reclamation activities, the project owner shall provide to BLM's Wildlife Biologist and the CPM an agency-approved ~~final~~draft Channel Decommissioning and Reclamation Plan. Modifications to the approved Channel Decommissioning Plan shall be made only after approval from BLM's Wildlife Biologist and the CPM, in consultation with USFWS, and CDFG. A final plan shall be approved by the BLM and the CPM no more than 90 days prior to the initiation of reclamation activities.

No more than 10 days prior to ~~initiating project-related ground disturbance activities~~start of Pre-Construction Site Mobilization, the project owner shall provide financial assurances to BLM's Wildlife Biologist and the CPM to guarantee that an adequate level of funding would be available to implement measures described in the Channel Decommissioning and Reclamation Plan, pursuant to 43 CFR 3809.550 et seq.

CLOSURE PLAN MEASURES

BIO-29 The project owner shall implement and incorporate into the facility closure plan measures to address the local biological resources related to facility closure. A funding mechanism shall be developed in consultation with staff to ensure sufficient funds are available for revegetation, reclamation, and decommissioning. The

facility closure plan shall address biological resources-related mitigation measures. In addition to these measures, the plan must include the following:

Removal of transmission conductors when they are no longer used and useful;

Removal of all above-ground and subsurface power plant site facilities and related facilities;

Methods for restoring wildlife habitat and promoting the reestablishment of native plant and wildlife species;

Revegetation of the project site and other disturbed areas utilizing appropriate methods for establishing native vegetation; components of the revegetation plan, including performance standards and monitoring, shall be as described in Condition of Certification **BIO-1 0;**

A cost estimate to complete closure-related activities, to be based upon decommissioning costs required under 43 CFR 3809.550 et seq.

An implementation and monitoring plan to ensure successful and satisfactory completion of every element of the Facility Closure Plan.

In addition, the project owner shall secure funding to ensure implementation of the plan and provide to the CPM and BLM Wildlife Biologist written evidence of the dedicated funding mechanism(s). The financial assurances may be in the form of an irrevocable letter of credit, a performance bond, a pledged savings account, or another equivalent form of security, as approved by the CPM and BLM Wildlife Biologist.

Verification: Prior to initiating ground-disturbing project activities, the project owner shall provide financial assurances (as described in this condition, above) to the CPM and BLM Wildlife Biologist to guarantee that an adequate level of funding will be available to implement decommissioning and closure activities described above.

At least 12 months prior to commencement of planned closure activities, the project owner shall address all biological resources-related issues associated with facility closure, and provide final measures, in a Biological Resources Element. The draft planned permanent or unplanned closure measures shall be submitted to the CPM, BLM Wildlife Biologist, CDFG, and USFWS. After revision, final measures shall comprise the Biological Resources Element, which shall include the items listed above as well as written evidence of the dedicated funding mechanism(s) for these measures. The final Biological Resources Element shall become part of the facility closure plan, which is submitted to the CPM and BLM Wildlife Biologist within 90 days of the permanent closure or another period of time agreed to by the CPM and BLM Wildlife Biologist.

In the event of an unplanned permanent closure, or an indeterminate suspension of operations, the project owner shall notify the CPM and BLM Wildlife Biologist , as well as other responsible agencies, by telephone, fax, or e-mail, within 24 hours and shall

take all necessary steps to implement the on-site contingency plan (see **Compliance** Conditions of Certification).

Upon facility closure, the project owner shall implement measures in the Biological Resources Element and provide written status updates on all closure activities to the CPM and BLM Wildlife Biologist at a frequency determined by the CPM and BLM's Wildlife Biologist.

IN-LIEU FEE MITIGATION OPTION

BIO-30 The Project owner may choose to satisfy certain compensatory mitigation obligations identified in this Decision by paying an in lieu fee to the Department of Fish and Game pursuant to Fish and Game code sections 2069 and 2099, to the extent the in-lieu fee provision is found by the Commission to be in compliance with CEQA and CESA requirements.

Verification: If electing to use this provision, the Project owner shall notify the Commission that it would like a determination that the in-lieu fee proposal meets CEQA and CESA requirements.

PROJECT CONSTRUCTION AND COMPENSATION PHASING PLAN

BIO-31 As an alternative to providing mitigation or security for the entire project prior to the start of the first ground-disturbing activities, the Project Owner may elect to provide compensatory mitigation for the total Project Disturbance Area in two phases and may elect to provide security in three phases as specified in this condition.

Only the phases identified as Phase 1~~a, Phase 1b,~~ and Phase 2, as described in this condition, in text and maps provided ~~on September 10, 2010~~in the Petition for Amendment by the Project Owner ~~(tn: 58411, Applicant's submittal of Updated Reduced Project Boundary Scenarios 5.5 or Figures 17 and 18 [Scenario 5.5])~~ may be used for the phasing of mitigation and security requirements. To the extent those sources are found to contain conflicting information about Project phasing, the description in this condition shall control. ~~In particular, the Project Owner has divided the project's Phase 1 activities into two separate sub-phases, identified as Phase 1 a and Phase 1 b, since the Supplemental Staff Assessment was prepared.~~ This condition presumes that the phases identified in this condition are identical to the phases that the Bureau of Land Management (BLM) will authorize work on through issuance of "notices to proceed"; if phases used by BLM are not identical to the phases as described in this condition and the materials identified

above, the Project Owner shall obtain separate written authorization from the CPM prior to beginning work on each of the ~~three~~two phases.

~~For purposes of this condition:~~

~~"Project Disturbance Area" or "ground disturbance area" means all areas that will be temporarily or permanently disturbed during construction or operation of the Project, including all linear facilities.~~

~~"Project footprint" means the Project Disturbance Area and undeveloped areas inside the Project's boundaries that will no longer provide functional habitat value, including but not limited to desert tortoise habitat, Mojave fringe toed lizard habitat, burrowing owl habitat, rare plant habitat, and areas within ephemeral washes and drainages.~~

~~"Project construction" or "construction" means any ground-disturbing activity, including but not limited to construction work, site mobilization, fence construction, or any tortoise translocation activities.~~

~~"Security" means the security that is required under other biological conditions of certification to ensure required mitigation measures will be implemented, or payments by the Project Owner into the National Fish and Wildlife Service mitigation account in accordance with the option provided in other conditions of certification.~~

Overview of Project Phases

~~Phase 1a is strictly limited to construction of the main access road, the waterline, the Main Services Area, the substation area, the installation of 60 SunCatcher pedestals, the temporary at-grade crossing over the Burlington Northern Santa Fe (BNSF) railroad tracks, the permanent bridge spanning the railroad tracks, and any surveys, translocations, or other activities required within the Phase 1a area that are required by Commission Conditions of Certification. The ground disturbance area during Phase 1a shall be no greater than 250 acres and shall be limited to the geographic areas indicated on the maps identified above.~~

~~Phase 1-b is strictly limited to construction of solar fields and related facilities located throughout the remainder of the area identified as Phase 1 in the Supplemental Staff Assessment and in applicant's Scenario 5.5-6 (tn: 58411, Applicant's submittal of Updated Reduced Project Boundary Scenarios 5.5 Information), and any surveys, translocations, or other activities required within the Phase 1-b area that are required by Commission Conditions of Certification. The ground disturbance area during Phase 1b shall be limited to the areas indicated on the maps identified above.~~

The majority of Phase 1 of the project is located south of the Burlington Northern Santa Fe (BNSF) Railway tracks and will include construction of the perimeter and desert tortoise fencing for Phase 1 and the main access road from the site access at Hector Road to the railroad tracks. It also includes construction of the main services complex, the substation, the water well (north of the tracks) and waterline to the main services complex, and the solar field consisting of Photovoltaic modules mounted on single axis tracking systems to produce up to 275 MW (AC). The water well and the waterline are located in the Project area north of the railroad tracks and will be constructed during Phase 1.

Phase 2 ~~is strictly limited to the remainder of the project site as identified as Scenario 5.5 in applicant's maps (tn: 58411, Applicant's submittal of Updated Reduced Project Boundary Scenarios 5.5).~~of the project includes construction of the perimeter and desert tortoise fencing for the Project area north of the railroad tracks, the bridge over the BNSF tracks and the continuation of the main access road. It also includes construction of the solar field which will be comprised of up to 288 MW (AC) of single axis tracking PV modules and 100.5 MW of SunCatchers with the SunCatchers to be built towards the center of Phase 2 so as to minimize edge effects caused by the noise and potential glint/glare from the SunCatchers. Phase 2 also includes the hydrogen generation, storage, and distribution system for the SunCatchers.

General Requirements

At no time may the Project Owner ~~cause~~perform ground-disturbance to any location outside of the area that has been approved for construction according to the phasing plan identified in this Condition of Certification without the approval of the CPM.

Prior to initiating construction in any phase of the Project, the Project Owner shall comply with all pre-construction requirements in this and other Conditions of Certification and shall notify the CPM that it has obtained a Notice to Proceed for the phase or subphase from the BLM.

Construction activities, including work on linear and non-linear features, shall not occur outside desert tortoise exclusion areas that have been fenced and cleared in accordance with USFWS protocols and as described in Condition of Certification **BIO-15** (Desert Tortoise Clearance and Exclusion Fencing).

The Project Owner shall provide security to ensure implementation of the mitigation requirements in Conditions of Certification **BIO-12** (Special-Status Plant Impact and Avoidance and Minimization), **BIO-13** (Mojave Fringe-Toed Lizard Mitigation), **BIO-16**

(Desert Tortoise Translocation Plan), **BIO-17** (Desert Tortoise Compensatory Mitigation), **BIO-21** (Burrowing Owl Impact Avoidance and Minimization Measures), and **BIO-26** (Streambed Impact Minimization and Compensation Measures) for each of the three phases prior to any Project construction associated with that phase. Phasing of security only applies to security required by the Conditions listed above. If the Project Owner elects to phase payments of security, the amount of the security (including payments to NFWF [see definition of security above]) will be adjusted by the CPM in consultation with CDFG, BLM and USFWS prior to each phase to reflect the CPM's best estimate at that time of the estimated costs of land acquisition, long-term management and maintenance costs, and other costs that are included in the security computation. Those costs may be greater than the costs identified in the Conditions of Certification.

Even when security has been provided, the Project Owner shall complete the acquisition, protection and transfer of all compensation lands required in the Conditions of Certification listed above, as well as all funding requirements associated with those lands, within the time periods identified in those Conditions of Certification, except that the time period for providing compensation lands and funding associated with ~~both Phases~~Phase 1~~a and 1b~~ shall be measured from the start of construction of Phase ~~1a alone,~~1, and the period for providing lands and funding required for Phase 2 activities shall be measured from the start of construction of Phase 2.

Additional requirements within the Project's Conditions of Certification that are not expressly phased in this Condition shall be phased as necessary to carry out the purpose of this condition, or to ensure that no project construction occurs in an area for which the Project Owner has not provided security and obtained permission to begin construction. Examples may include such activities as construction and location of desert tortoise exclusion fencing or timing of pre-construction clearance surveys for other species. The Project Owner shall first obtain approval from the CPM, acting in consultation with BLM, CDFG and USFWS, for the phasing of any requirements or deadlines that are not expressly phased in Conditions of Certification.

Detailed Phasing Requirements

Phased impacts and compensation requirements are described in tables below, by phase.

Phase 1~~a~~

Phase 1~~a~~ would result in the loss or isolation of ~~250~~2,1444 acres of desert tortoise habitat from the placement of fencing, road construction, and the development of project facilities. ~~The construction and fencing of the temporary and Main~~

~~Access Road would also result in the temporary isolation of approximately 650 acres of desert tortoise habitat.~~ In addition, proposed Phase 1~~a~~ Project construction would affect Mojave fringe-toed lizard habitat and would affect state-jurisdictional streambeds and, possibly, burrowing owl or rare plant locations that are identified during pre-construction and late-season botanical surveys. The ~~applicant~~project owner shall provide an enumeration of streambed, burrowing owl, and rare plant habitat impacts and shall provide security for required compensation those impacts as described in Conditions of Certification **BIO-12** (Special-Status Plant Impact and Avoidance and Minimization), **BIO-13** (Mojave Fringe-Toed Lizard Mitigation), **BIO-16** (Desert Tortoise Translocation Plan), **BIO-17** (Desert Tortoise Compensatory Mitigation), **BIO-21** (Burrowing Owl Impact Avoidance and Minimization Measures), and **BIO-26** (Streambed Impact Minimization and Compensation Measures) prior to initiating Project construction associated with Phase ~~1a,~~1, as set forth in the verification section of this Condition.

All project access throughout Phase 1~~a~~ construction shall be via temporary or permanent access as mapped by the ~~applicant. Isolation of desert tortoise habitat between the proposed temporary and permanent construction access routes shall be limited to winter months when tortoises are largely inactive~~project owner. Desert tortoise exclusion fencing shall be installed along the existing temporary construction access routes to allow access and construction of the well and waterline north of the railway prior to other ground disturbance at the project site, and fencing shall be maintained as described in Condition of Certification **BIO-15** (Desert Tortoise Clearance and Exclusion Fencing) until completion of the proposed Main Access Road. Desert tortoise exclusion fencing shall be installed along the proposed Main Access Road alignment prior to beginning construction of that road. ~~If project-related access along the temporary construction access route continues beyond March 15, 2011, the Project Owner shall provide additional security to the CPM for all acreage within the area isolated between the two fenced access routes (estimated by staff as approximately 650 acres) by March 15, 2011 and shall implement desert tortoise clearance surveys and translocation of any tortoises within the isolated area consistent with the requirements of Condition of Certification **BIO-15** (Desert Tortoise Clearance and Exclusion Fencing) . If the Main Access Road is complete by March 15, 2011 and no further project access via the temporary route is necessary, desert tortoise fencing along the temporary access road shall be removed on or before March 15, 2011~~

BIO-31 Table ~~1a.~~1.
Phase 1~~a~~ Impacts and Compensation Acreage ~~(Scenario 5.5)~~

~~Resource~~	~~Phase 1a Impact (acres) and Mitigation Ratios~~	~~Compensation (acres)~~
~~Direct impact: Desert tortoise habitat~~	~~56 ac. S of BNSF at 1:1 194 ac. N of BNSF~~	~~56~~ ~~582~~
~~State Jurisdictional streambed~~ ~~1~~	~~[to be provided by Project Owner] at 1:1~~	
~~Mojave fringe-toed lizard~~ ~~1~~	~~0~~	~~000~~
~~Additional (burrowing owl, special status~~	~~[to be provided by Project Owner] at 3:1~~	
~~**Total per-acre basis for Phase 1a Security (through**~~		~~**638**~~ ~~2~~ ~~**acres**~~
~~Potential impact: Isolation of desert tortoise habitat~~	~~650 acres at 1:1~~ ~~[staff estimate; to be verified~~	~~650 acres~~
~~**Total per-acre basis for Phase 1a Security (after**~~		~~**1,288**~~ ~~2~~ ~~**acres**~~

~~1. Compensation may be nested within desert tortoise compensation land.~~
~~2. Acreages to be adjusted upon completion of each construction phase and upon confirmation by CPM in consultation with CDFG, USFWS, and BLM of acres impacted.~~

~~**Phase 1b**~~

~~Phase 1 b consists of solar generators in the central portion of the project area, north of the BNSF railroad. Phase 1 b would directly impact 1,626 acres of desert tortoise habitat. Compensation mitigation ratios for these project components shall be as described in Condition of Certification **BIO-17**(Desert Tortoise Compensatory Mitigation). Construction of stormwater detention basins and debris basins that may be constructed during Phase 1b, pending hydrology analyses and BNSF review pursuant to Condition of Certification **SOIL AND WATER-8** will also result in direct impacts to State jurisdictional streambeds located downstream in portions of Phase 2. For that reason, all jurisdictional waters that occur below any future detention basins may also be included in the calculation of Phase 1 b security and in the calculation of Phase 1 mitigation requirements. In addition, proposed Phase 1 b Project construction could affect burrowing owl or rare plant locations that may be identified during pre-construction and late-season botanical surveys required in the Conditions of Certification described below. The applicant shall provide the CPM with an enumeration of burrowing owl and rare plant habitat impacts and shall provide security for required compensation of those impacts as described in Conditions of Certification **BIO-12** (Special Status Plant Impact and Avoidance and Minimization), **BIO-17**(Desert Tortoise Compensatory Mitigation), **BIO-21**~~

~~(Burrowing Owl Impact Avoidance and Minimization Measures), and **BIO-26** (Streambed Impact Minimization and Compensation Measures). Security shall be provided prior to the start of any Phase 1 b construction, as set forth in the verification section of this Condition, or prior to September 1, 2011, whichever occurs first.~~

~~BIO-31 Table 1b.~~
~~Phase 1b Impacts and Compensation Acreage (Scenario 5.5)~~

Resource	Phase 1~~b~~ Impact (acres) and Mitigation Ratios	Compensation (acres)
Direct impact: Desert tortoise habitat ~~(excluding disturbed or isolated acreage reported above in~~	~~1,626~~2,140 ac. S of BNSF at 1:1 4 ac. N of BNSF at 3:1	~~4,878 acres~~2,152
State Jurisdictional streambed [1]	[to be provided by Project Owner] at 1:1 ~~Owner] at 1:1~~	
Mojave fringe-toed lizard [1]	~~[to be provided by Project Owner] at 1:1~~	64.2 ~~99143.3~~
Additional (burrowing owl, special status	[to be provided by Project Owner] 11as	
Total per-acre basis for Phase 1~~b~~ Security		**~~4,878~~[2] 3[2] 32,152[2] acres**

Compensation may be nested within desert tortoise compensation land.
Acreages to be adjusted upon completion of each construction phase and upon confirmation by CPM in consultation with CDFG, USFWS, and BLM of acres impacted.

Phase 2

Phase 2 construction would directly impact 2,473 acres of occupied desert tortoise habitat north ~~and south~~ of the BNSF railroad tracks. ~~Phase 2 would impact 2,085 acres of occupied desert tortoise habitat south of the BNSG railroad tracks~~2,104 acres of which are to be mitigated at a ~~1~~3:1 ratio~~. In addition, Scenario 5.5 would impact~~, and 369 acres of high-density occupied desert tortoise habitat to be mitigated at the 5:1 ratio. Compensation mitigation ratios for these project components shall be as described in Condition of Certification **BIO-17** (Desert Tortoise Compensatory Mitigation). In addition, proposed Phase 2 Project construction~~ would affect Mojave fringe-toed lizard habitat and~~ could affect burrowing owl or rare plant locations that may be documented during late-season field surveys. The ~~applicant~~project owner shall provide the CPM an enumeration of burrowing owl, and rare plant habitat impacts and shall provide security for required compensation of those impacts as described in Conditions of Certification **BIO-12** (Special-Status Plant Impact and Avoidance

and Minimization), **BIO-~~13 (Mojave Fringe-Toed Lizard Mitigation), BIO-~~16** (Desert Tortoise Translocation Plan), **BIO-17** (Desert Tortoise Compensatory Mitigation), **BIO-21** (Burrowing Owl Impact Avoidance and Minimization Measures), and **BIO-**26 (Streambed Impact Minimization and Compensation Measures) Security for each phase shall be provided to the CPM, prior to beginning of ~~any project-related ground disturbing activities~~the start of Pre-Construction Site Mobilization of such phase, as set forth in the verification section of this Condition.

BIO-31 Table 2.
Phase 2 Impacts and Compensation Acreage.

Resource	Phase 2 Impact (acres) and Mitigation Ratios	Compensation (acres)
Desert tortoise habitat ~~(excluding disturbed or isolatedat 3:1 acreage in Phase 1a; see Table 1a)~~	~~2,085~~2,104 acres ~~S of BNSF at 13:1~~ ~~283 acres N of BNSF at 3:1~~	~~2,085~~6,312 ~~849~~
Desert tortoise habitat at 5:1 ~~(Scenario 5.5 only)~~	369 acres at 5:1	1,845
State Jurisdictional streambed [1]	0	0
~~Mojave fringe-toed lizard [1]~~	~~21.4 acres at 1:1 143.3~~	~~21.4 429.~~
Additional (burrowing owl, special status plants)	To be provided by the Project	
Total ~~Scenario 5.5~~ per-acre basis for Phase 2 Security		~~5,230~~[2]8,157[2] **acres**

Compensation may be nested within desert tortoise compensation land.
Acreages to be adjusted upon completion of each construction phase and upon confirmation by CPM in consultation with CDFG, USFWS, and BLM of acres impacted.

Verification: No fewer than 30 days prior to the start of desert tortoise clearance surveys for each phase, the Project owner shall submit a description of the proposed construction activities for that phase to CDFG, USFWS and BLM for review and to the CPM for review and approval. The description for each phase shall include the proposed construction schedule, a figure depicting the locations of proposed construction and number of acres of rare plant habitat, burrowing owl habitat, and state-jurisdictional streambeds to be disturbed.

If all mitigation requirements, including habitat acquisition and protection, are not completed for a Project phase at least 30 days prior to the start of ~~ground-disturbing activities~~Pre-Construction Site Mobilization for that phase, the Project Owner shall provide verification to the CPM and CDFG that approved security (as described in Conditions of Certification **BIO-12** (Special-Status Plant Impact and

Avoidance and Minimization), **BIO-13** (Mojave Fringe-Toed Lizard Mitigation), **BIO-16** (Desert Tortoise Translocation Plan), **BIO-17** (Desert Tortoise Compensatory Mitigation), **BIO-21** (Burrowing Owl Impact Avoidance and Minimization Measures), and **BIO26** (Streambed Impact Minimization and Compensation Measures)) has been established in accordance with these Conditions of Certification no later than 30 days prior to ~~beginning ground-disturbing activities~~start of Pre-Construction Site Mobilization for each ~~Phase~~phase. Prior to submitting verification regarding the security to the CPM, the project owner shall obtain the CPM's approval of the security as required by the other Conditions.

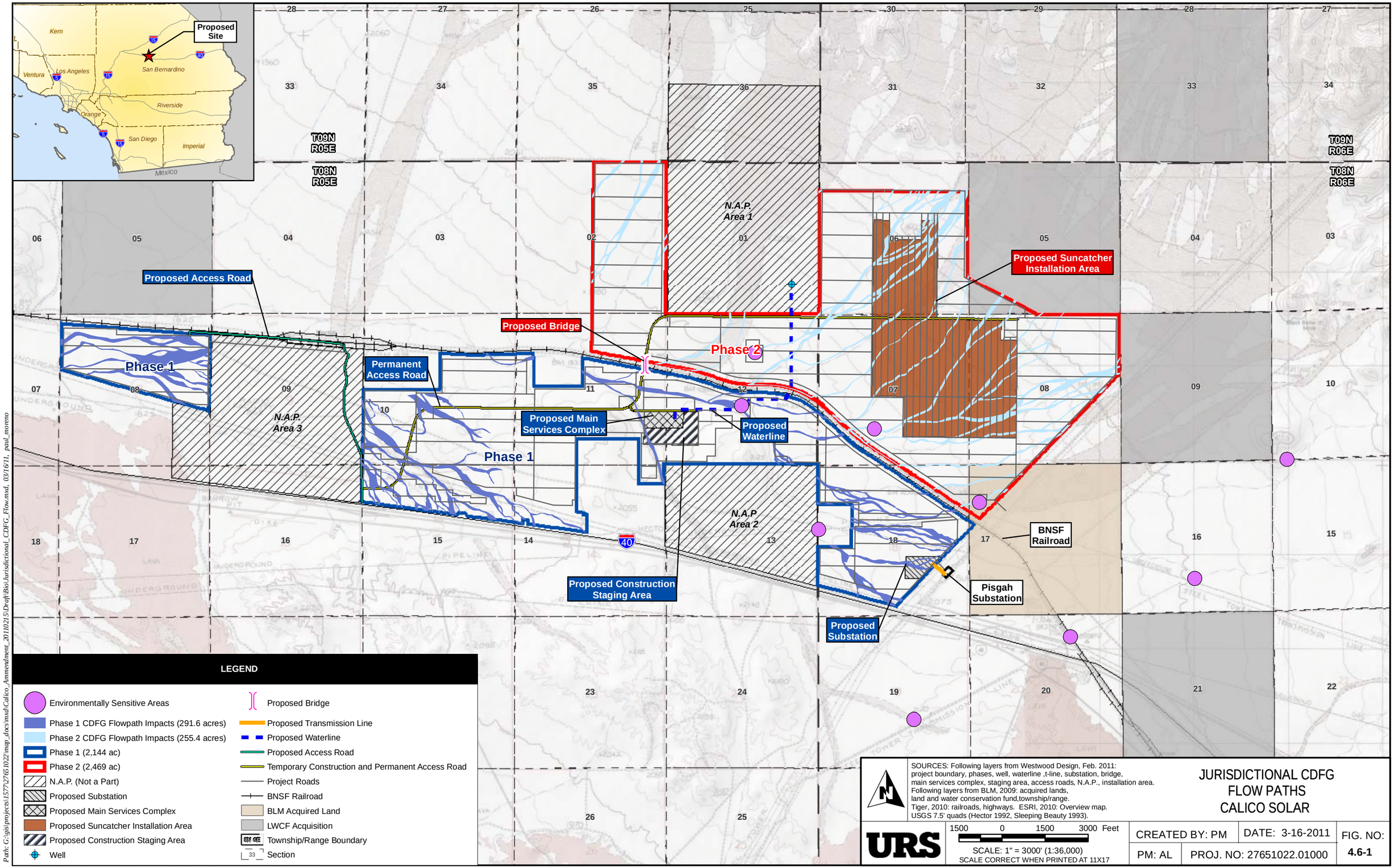
~~For Phase 1-b, the Project Owner shall obtain the CPM's approval of security and shall provide verification that approved security has been established by September 1, 2011 or 30 days prior to the start of Phase 1b construction, whichever occurs first. The fixed deadline for Phase 1-b security is necessary because under terms of this Condition, compensation lands and associated funding for both Phase 1a and Phase 1b will be due in the first half of 2012, assuming Phase 1a construction begins as planned in late 2010, and security must be in place well in advance of the mitigation obligations that are being guaranteed.~~

The Project Owner shall provide written verification to the CPM, CDFG, BLM and USFWS of the compensation lands acquisition, protection, and transfer requirements and satisfaction of associated funding requirements as set forth in **BIO-17** and other conditions within the following time frames: (1) For Phase 1~~a and Phase 1b~~ mitigation, verification shall be provided no later than ~~1 - 8~~18 months after the start of ~~construction~~Pre-Construction Site Mobilization of Phase ~~1a,~~1, and (2) for Phase 2 mitigation, such verification shall be provided no later than 18 months after the start of ~~construction~~Pre-Construction Site Mobilization of Phase 2. Other verification, notification and reporting requirements and other deadlines set forth in BIO-17 and other Conditions that relate to compensation land requirements, to the option of funding mitigation through the NFWF account, or to use of approved third parties to carry out mitigation requirements also apply to Phase 1 ~~(1a and 1b combined)~~ and to Phase 2.

Within 90 days after completion of ~~all~~ project ~~related ground disturbance~~construction for each project phase ~~or sub-phase~~, the project owner shall provide to the CPM, CDFG, BLM and USFWS an analysis, based on aerial photography, with the final accounting of the amount of habitat disturbed during Project construction.

4.6.7 References Cited

No references other than those presented in the Approved Project's record were used in the preparation of this analysis.


Proposed Site
Kern
Ventura
Los Angeles
San Bernardino
Riverside
Orange
San Diego
Imperial
Mexico
T09N R05E
T08N R05E
T09N R06E
T08N R06E
N.A.P. Area 1
N.A.P. Area 2
N.A.P. Area 3
Proposed Access Road
Proposed Bridge
Proposed Suncatcher Installation Area
Phase 1
Phase 2
Permanent Access Road
Proposed Main Services Complex
Proposed Waterline
Proposed Construction Staging Area
BNSF Railroad
Pisgah Substation
Proposed Substation
LEGEND
Environmentally Sensitive Areas
Phase 1 CDFG Flowpath Impacts (291.6 acres)
Phase 2 CDFG Flowpath Impacts (255.4 acres)
Phase 1 (2,144 ac)
Phase 2 (2,469 ac)
N.A.P. (Not a Part)
Proposed Substation
Proposed Main Services Complex
Proposed Suncatcher Installation Area
Proposed Construction Staging Area
Well
Proposed Bridge
Proposed Transmission Line
Proposed Waterline
Proposed Access Road
Temporary Construction and Permanent Access Road
Project Roads
BNSF Railroad
BLM Acquired Land
LWCF Acquisition
Township/Range Boundary
Section
SOURCES: Following layers from Westwood Design, Feb. 2011:
project boundary, phases, well, waterline ,t-line, substation, bridge,
main services complex, staging area, access roads, N.A.P., installation area.
Following layers from BLM, 2009: acquired lands,
land and water conservation fund,township/range.
Tiger, 2010: railroads, highways. ESRI, 2010: Overview map.
USGS 7.5' quads (Hector 1992, Sleeping Beauty 1993).
JURISDICTIONAL CDFG
FLOW PATHS
CALICO SOLAR
URS
1500 0 1500 3000 Feet
SCALE: 1" = 3000' (1:36,000)
SCALE CORRECT WHEN PRINTED AT 11X17
CREATED BY: PM
DATE: 3-16-2011
FIG. NO:
PM: AL
PROJ. NO: 27651022.01000
4.6-1
Path: G:\gis\projects\1577\27651022\map_docs\mxd\Calico_Ammendment_20110215\Draft\Bio\Jurisdictional_CDFG_Flow.mxd, 03/16/11, paul_moreno

4.7 CULTURAL RESOURCES AND NATIVE AMERICAN VALUES

As described in detail below impacts of the Modified Project to cultural resources and Native American values are expected to be less than those of the Approved Project.

4.7.1 Summary of Project Changes Related to Cultural Resources

The Modified Project involves the reduction of SunCatcher technology, the addition of PV modules, and a phasing change compared to the Approved Project. The Modified Project would not change the Approved Project footprint (see Appendix E, filed under confidential cover) and would not disturb a greater area or volume of soils within the footprint compared to the Approved Project area. The only proposed modification that relates to cultural resources is the addition of PV modules; whereas SunCatchers are 40 feet tall, the PV modules would, on average, be approximately 9 feet above ground. This change is relevant to the Modified Project's visual impacts to US Route 66.

4.7.2 Changes in Environmental Impacts

The Commission Decision identified significant impacts to cultural resources (Commission Decision, Cultural Resources, pages 55-60). The Commission Decision concluded that construction of the Approved Project may wholly or partially destroy the majority of the surface archaeological resources in the Approved Project area of analysis; cause a net reduction in archaeological resources; destroy a potential archaeological landscape; and indirectly impact three National Register of Historic Places (NRHP)- and California Register of Historical Resources (CRHR)-eligible archaeological sites (Commission Decision, Cultural Resources, pages 37-38, 57-58). As a result, the Commission Decision set forth Conditions that address potential effects from construction activities and impacts, operation activities and impacts, Project closure and decommissioning, project-related future actions, and cumulative impacts in order to reduce archaeological impacts to a level less than significant. As described below, the Modified Project would result in no increased impacts to cultural resources or Native American values in the Project area.

4.7.2.1 Route 66

The Commission Decision concluded that there would be a direct visual effect to one built environment resource, U.S. Route 66 (CA-SBR-2910H), from the installation of the proposed 26,540 SunCatcher dishes. The portion of U.S. Route 66 within the Project area is a contributing feature toward a NRHP-eligible historic property and CRHR-eligible historical resource. The direct visual effect would represent a significant and unavoidable impact (Commission Decision, Cultural Resources, pages 59-60).

Under the Modified Project, the number of SunCatcher units would be reduced from about 26,540 to approximately 4,020, and approximately 2,140 PV Tracker Blocks would be added (Commission Decision, Project Description, page 5; Section 2, Proposed Modifications of this AFC Amendment). As a result of these changes, the direct visual effect to U.S. Route 66 would be less, since there would be fewer SunCatcher units in the Project footprint, and the PV Tracker Blocks would be approximately 30 feet shorter in height than the SunCatchers. These changes would result in a less significant direct visual effect to the historic setting, viewshed, and feeling of U.S. Route 66. However, the impacts to U.S. Route

66 from the Modified Project would still be considered significant and unavoidable due to the permanent impairment of the landscape's character-defining features and travel experience associated with U.S. Route 66. As noted in the Commission Decision, under the Approved Project, views might be obstructed for a distance of nearly 20 miles from the Project, however, under the Modified Project, it is expected that the obstruction would be substantially less significant due to the lower height of the PV equipment (Commission Decision, Cultural Resources, pages 59-60). Although the impacts would be less significant under the Modified Project, the Project would still cause a significant and unavoidable impact to cultural resources.

4.7.2.2 Archaeological Resources

The Commission Decision concluded that there would be a direct effect to archaeological resources as a result of the Approved Project. Because there would be no increase to the Project footprint, boundaries, or overall disturbance under the Modified Project, despite changes to the Project layout and facilities components, there would be no increase in impacts to archaeological resources or Native American values. Therefore, the Modified Project would result in no additional significant impacts to cultural resources in the Project area.

4.7.3 Changes in Cumulative Environmental Impacts

The Commission Decision concluded that the construction and operation of the Approved Project, in addition to the other foreseeable cumulative projects in the Project area, would contribute to permanent long term, potentially unmitigable, cumulative adverse impacts (Commission Decision, Cultural Resources, pages 67-68). Incremental impacts of the Modified Project on archaeological resources or Native American values are expected to be the same or slightly reduced compared to the Approved Project. As described in Section 4.23, Cumulative Scenario, no new reasonably foreseeable future actions beyond those assumed in the Commission Decision have been identified. Therefore, no increase in cumulative impacts under the Modified Project is anticipated.

4.7.4 Changes in LORS Conformance and Other Permits

In the Commission Decision, the Commission concluded that, with the implementation of the Conditions, the Approved Project would comply with all applicable LORS. The Commission identified the LORS associated with archaeological resources or Native American values as set forth in the pertinent portion of Appendix A of the Commission Decision. As with the Approved Project, the Modified Project would comply with all applicable LORS, and no new or additional LORS have been identified.

As with the Approved Project, the Modified Project would be required to obtain the following permits: BLM Statewide permit CA-0611 issued to URS and BLM Fieldwork Authorization to Conduct Specific Cultural Resources Work FA-680-08-26 (Calico Solar Project Technical Report, page 1-1). The Modified Project would not necessitate any additional permits.

4.7.5 Changes in Proposed Mitigation

Since there would be no additional impacts to cultural resources under the Modified Project, and no regulatory changes that affect cultural resources, no changes in the proposed mitigation measures under the Modified Project are anticipated.

4.7.6 Changes in Conditions of Certification

The conforming changes to the Conditions for the Modified Project related to cultural resources or Native American values are:

~~**CUL-1** Prior to the start of ground disturbance (includes "preconstruction site mobilization," "ground disturbance," and "construction grading, boring, and trenching," as defined in the General Conditions for this project), the project owner shall obtain the services of a Cultural Resources Specialist (CRS) and one or more alternate CRSs (at the project owner's option).~~

CUL-1 The project owner shall obtain the services of a Cultural Resources Specialist (CRS) and one or more alternate CRSs (at the project owner's option).

The CRS shall manage all cultural resources monitoring, mitigation, curation, and reporting activities in accordance with the Conditions of Certification (Conditions). The CRS may elect to obtain the services of Cultural Resources Monitors (CRMs) and other technical specialists, if needed, to assist in monitoring, mitigation, and curation activities. The project owner shall ensure that the CRS makes recommendations regarding the eligibility for listing in the California Register of Historical Resources (CRHR) of any cultural resources that are newly discovered or that may be affected in an unanticipated manner. No ~~ground disturbance~~Pre-Construction Site Mobilization shall occur prior to Compliance Project Manager (CPM) approval of the CRS and alternates, unless such activities are specifically approved by the CPM.

Approval of a CRS may be denied or revoked for reasons including but not limited to non-compliance on this or other Energy Commission projects. After all ground disturbance is completed and the CRS has fulfilled all responsibilities specified in these cultural resources conditions, the project owner may discharge the CRS, if the CPM approves. With the discharge of the CRS, these cultural resources conditions no longer apply to the activities of this power plant. **Cultural Resources Specialist**

The resumes for the CRS and alternate(s) shall include information demonstrating to the satisfaction of the CPM that their training and backgrounds conform to the U.S. Secretary of Interior's Professional Qualifications Standards, as published in Title 36, Code of Federal

Regulations, part 61 (36 C.F.R., part 61). In addition, the CRS shall have the following qualifications:

The CRS's qualifications shall be appropriate to the needs of the project and shall include a background in anthropology, archaeology, history, architectural history, or a related field;

At least three years of archaeological or historical, as appropriate (per nature of predominant cultural resources on the project site), resource mitigation and field experience in California; and

3. At least one year of experience in a decision-making capacity on cultural resources projects in California and the appropriate training and experience to knowledgably make recommendations regarding the significance of cultural resources.

The resumes of the CRS and alternate CRS shall include the names and telephone numbers of contacts familiar with the work of the CRS/alternate CRS on referenced projects and demonstrate to the satisfaction of the CPM that the CRS/alternate CRS has the appropriate training and experience to implement effectively the Conditions.

Cultural Resources Monitors

CRMs shall have the following qualifications:

a B.S. or B.A. degree in anthropology, archaeology, historical archaeology, or a related field, and one year experience monitoring in California; or

an A.S. or A.A. degree in anthropology, archaeology, historical archaeology, or a related field, and four years' experience monitoring in California; or

3. enrollment in upper division classes pursuing a degree in the fields of anthropology, archaeology, historical archaeology, or a related field, and two years of monitoring experience in California.

Cultural Resources Technical Specialists

The resume(s) of any additional technical specialist(s), e.g., historical archaeologist, historian, architectural historian, and/or physical anthropologist, shall be submitted to the CPM for approval.

Verification: At least 45 days prior to the start of ~~ground disturbance~~Pre-Construction Site Mobilization, the project owner shall submit the resume for the CRS, and alternate(s) if desired, to the CPM for review and approval. At least 10 days prior to a termination or release of the CRS, or within 10 days after the resignation of a CRS, the project owner shall submit the resume of the proposed new CRS to the CPM for review and approval. At the same time, the project owner shall also provide to the proposed new CRS the AFC and all cultural resources documents, field notes,

photographs, and other cultural resources materials generated by the project. If no alternate CRS is available to assume the duties of the CRS, a monitor may serve in place of a CRS so that ground disturbance may continue up to a maximum of 3 days without a CRS. If cultural resources are discovered then ground disturbance will remain halted until there is a CRS or alternate CRS to make a recommendation regarding significance.

At least 20 days prior to ~~ground disturbance~~Pre-Construction Site Mobilization, the CRS shall provide a letter naming anticipated CRMs for the project and stating that the identified CRMs meet the minimum qualifications for cultural resources monitoring required by this Condition.

At least 5 days prior to additional CRMs beginning on-site duties during the project, the CRS shall provide letters to the CPM identifying the new CRMs and attesting to their qualifications.

At least 10 days prior to any technical specialists, other than CRMS, beginning tasks, the resume(s) of the specialists shall be provided to the CPM for review and approval.

At least 10 days prior to the start of ~~ground disturbance~~Pre-Construction Site Mobilization, the project owner shall confirm in writing to the CPM that the approved CRS will be available for onsite work and is prepared to implement the cultural resources conditions.

CUL-2 ~~Prior to the start of ground disturbance, if~~If the CRS has not previously worked on the project, the project owner shall provide the CRS with copies of the AFC, data responses, confidential cultural resources reports (upon BLM approval), and the Energy Commission's Supplemental Staff Assessment Part II (SSA Part II) and the BLM's Final Environmental Impact Statement (FEIS) for the project. The project owner shall also provide the CRS and the CPM with maps and drawings showing the footprints of the power plant, all linear facility routes, all access roads, and all laydown areas. Maps shall include the appropriate USGS quadrangles and a map at an appropriate scale (e.g., 1:2400 or 1" = 200') for plotting cultural features or materials. If the CRS requests enlargements or strip maps for linear facility routes, the project owner shall provide copies to the CRS and CPM. The CPM shall review map submittals and, in consultation with the CRS, approve those that are appropriate for use in cultural resources planning activities. No ground disturbance shall occur prior to CPM approval of maps and drawings, unless such activities are specifically approved by the CPM.

If construction of the project would proceed in phases, maps and drawings not previously provided shall be provided to the CRS and CPM prior to the start of each phase. Written notice identifying the proposed schedule of each project phase shall be provided to the CRS and CPM.

~~Weekly, until ground disturbance is completed, the project construction manager shall provide to the CRS and CPM a schedule of project activities for the following week, including the identification of area(s) where ground disturbance will occur during that week.~~

~~The project owner shall notify the CRS and CPM of any changes to the scheduling of the construction phases.~~

Verification: At least 15 days prior to the start of ~~ground disturbance~~Pre-Construction Site Mobilization, the project owner shall provide the AFC, data responses, confidential cultural resources documents, the SSA Part II, and the FEIS to the CRS, if needed, and the subject maps and drawings to the CRS and CPM. The CPM will review submittals in consultation with the CRS and approve maps and drawings suitable for cultural resources planning activities. Project owner shall submit confidential information to the CPM, only after receiving approval from the BLM.

At least 15 days prior to the start of ~~ground disturbance~~Pre-Construction Site Mobilization, if there are changes to any project-related footprint, the project owner shall provide revised maps and drawings for the changes to the CRS and CPM.

At least 15 days prior to the start of Pre-Construction Site Mobilization of each phase of a phased project, the project owner shall submit the appropriate maps and drawings, if not previously provided, to the CRS and CPM.

Weekly, during ~~ground disturbance~~Pre-Construction Site Mobilization, a current schedule of anticipated project activity shall be provided to the CRS and CPM by letter, e-mail, or fax.

Within 5 days of changing the scheduling of phases of a phased project, the project owner shall provide written notice of the changes to the CRS and CPM.

CUL-3 Changes to the proposed project or to the character of its construction, operation, and maintenance that may become necessary subsequent to the approval of the project, were such approval to occur, may in turn require the re-consideration of the extent of the original project area. Where such changes indicate the need to alter the original project area to include additional lands that were not elements of analysis during the certification process, the effects of any proposed changes on historical resources that may be on such lands would need to be taken into account. Changes in the character of the construction, operation, and maintenance of the proposed project may include such actions as decisions to use non-commercial borrow or disposal sites.

Upon the recognition that proposed changes to the project would require the use of lands that were not a part of the original project area of analysis, the project owner shall ensure that the CRS surveys any such lands for cultural resources and record each newly found resource on DPR 523 Series forms. Exceptions would be made to this protocol in cases where cultural resources surveys no greater than five years in age are documented for the entirety of the subject lands and approved by the CPM. Where new cultural resources surveys are warranted, the project owner shall convey the results of such surveys, along with the CRS's recommendations for further action, to the CPM, who will determine whether further action is necessary. If the CPM determines that historical resources may be present and that any such resource may be subject to a substantial adverse change in its significance, the project owner shall ensure that the CRS provides the CPM with substantiated recommendations on whether each such resource is eligible for listing in the CRHR and recommendations for the resolution of any such significant effects. The CRS, the project owner, and the CPM shall then confer on said recommendations, and, upon the concurrence of the CPM with those recommendations, the project owner shall ensure that the CRS proceeds to implement them, and reports on the methods and the results of any such work in the final Cultural Resources Report (CRR) (**CUL-8).**

Verification: Upon the recognition that proposed changes to the project or to the character of the construction, operation, and maintenance of the project would require the use of lands that were not a part of the original project area, the project owner shall notify the CRS and CPM. The project owner shall then provide, for CPM review and approval, documentation of any cultural resources surveys five years or less in age that exist for the additional lands.

At least 105 days prior to the use of the new additional project area lands, in the absence of any such cultural resources surveys or when the extant cultural resources surveys do not cover the entirety of the lands to be added to the project area, the project owner shall ensure that the CRS surveys the additional lands for cultural resources, notifies the project owner and the CPM of the results of the new cultural resources survey, and recommends further action.

No more than 15 days subsequent to the receipt of the information in verification 2, **CUL-3,** above, the CPM shall determine whether historical resources may be present and whether any such resources may be subject to substantial adverse changes in significance.

At least 60 days prior to the use of the new additional project area lands, if the CPM determines that historical resources may be subject to substantial adverse changes in significance, the project owner shall ensure that the CRS provides the CPM with substantiated evaluations, based on archival and field research, on whether each such resource is eligible for listing in the CRHR and recommendations for the resolution of any potential significant effects.

For no longer than 15 days, the project owner, the CRS, and the CPM shall confer about the above evaluations and recommendations, and, upon the concurrence of the CPM with those evaluations and recommendations, the project owner shall ensure that the CRS proceeds to resolve any significant effects pursuant to the above recommendations prior to the use of the new additional project area lands. The project owner shall ensure that the CRS reports on the methods and the results of all such work in the CRR (**CUL-7).**

Project owner shall submit confidential information to the CPM, only after receiving approval from the BLM.

CUL-4 ~~Prior to the start of ground disturbance, the~~The project owner shall develop, prepare, and implement a series of protocols the purposes of which will be to gather and analyze information to refine the assessments of the historical significance of the archaeological resources in the project area of analysis. The project owner shall prepare and submit, for the review and approval of the CPM and consistent with the guidance found in the February 1990 "Archaeological Resource Management Reports (ARMR): Recommended

Contents and Format" and the February 1991 "Guidelines for Archaeological Research Designs," separate protocols for the CRHR evaluation of each archaeological site type or site type group in the CPM-approved, final archaeological resource taxonomy and for each archaeological district, landscape, or other large-scale archaeological resource in the subject taxonomy. A field methodology will be included in each protocol which outlines a representative sample of 20% of each of the site types which would be selected for further evaluation. Ground disturbance on or in the vicinity of sites selected for evaluation may not commence until the evaluation reports have been completed. Ground disturbance may begin on portions of the project area which do not contain sites selected for further evaluation, subject to the construction monitoring provisions of **CUL-9.** Among the large-scale resources that the project owner shall explicitly are a prehistoric archaeological landscape that encompasses the numerous and diverse individual prehistoric archaeological sites across the desert pavements in the southern portion of the project area, a potential historical archaeological gravel mining district over roughly the western to west-central portion of the project area, and the archaeological remnants of the segment of the National Trails Road in the project area that may be a contributing element to a National Trails Road historic district.

Each CRHR evaluation protocol shall include, at a minimum, the following elements:

A background research section which develops interpretive contexts germane to each protocol and which presents information on previous research in the vicinity of the project area, generally, and on previous research on the specific resource types under consideration in the respective protocols.

An evaluation phase research design which, in the case of protocols prepared for individual archaeological resource types or type groups, should include a rationalized 20% sample of the resources in a type or type group, rather than a protocol structured to sample 100 percent of the population of a type or type group, and which explicitly takes into account extant information on the subject resources.

A detailed and explicit field methodology tailored to acquire the data necessary to address specific research questions.

Provisions for specialists to be present on site and specialized laboratory analyses of recovered cultural materials where feasible and if determined necessary to complete CRHR evaluation.

5. Provisions for laboratory analyses of chronometric samples, and organic remains and residues, where feasible and if determined necessary to complete CRHR evaluation.

Where defensible relative to archaeological theory, the project owner may submit documents that, within a single document, tier several separate evaluation protocols from common background research. In such documents, the project owner would develop and present germane prehistoric or historic contexts and present a general review of previous archaeological research in the project area vicinity before laying out the specific evaluation protocols for particular archaeological resources by reviewing previous archaeological research specific to a resource type, type group, or large-scale resource, and then developing and presenting custom research designs for those particular resources.

Subsequent to the completion of the implementation of each protocol, the project owner shall prepare and submit, for the review and approval of the CPM, separate reports on the results of the implementation of each protocol, on the analysis and interpretation of that data, and on the CRHR evaluation of the resource type, type group, or large-scale resource that a subject protocol addresses.

Each CRHR evaluation report shall include, unless otherwise determined by the CPM, the following elements:

Synopses of the background research section, evaluation phase research design, field methodology, and material culture, chronometric, and organic analyses as set out in the relevant original evaluation protocol.

A detailed, explicit, illustrated presentation of the results of the field and laboratory work done under the relevant protocol.

An analysis and behavioral interpretation of data from previous research and of field and laboratory data acquired as the result of the implementation of the relevant protocol.

Formal evaluation of the specific resource types relative to the CRHR program. The project owner may lump the evaluation reports into report documents that reflect any prior approved protocol documents that contain more than one protocol.

Should an agreement document be executed in consideration of the proposed action pursuant to 36 CFR §§ 800.6 or 800.14(b) among the Bureau of Land Management or other Federal agencies, and the California State Historic Preservation Officer, with or without the participation of the Advisory Council on Historic Preservation, and should that document provide for the collection of factual evidence sufficient to substantiate the evaluation of the California Register of Historical Resources eligibility of those potentially effected archaeological resources, as determined by the CPM, then the ~~applicant~~project owner shall adhere to the executed agreement document to mitigate any significant effects. The requirements as set out in the executed agreement document shall supersede the requirements set out above and the requirements set out above would have no further force or effect.

Should the executed agreement document be amended in such a manner that it no longer can be reasonably judged to provide for the collection of factual evidence sufficient to substantiate the evaluation of the California Register of Historical Resources eligibility of those potentially effected archaeological resources, as determined by the CPM, or should the executed agreement document be terminated prior to the complete implementation of the mitigation measures set out in it, then the project owner shall implement the above requirements, in addition to any measures set out under the amended agreement document and in addition to any measures that may have been partially completed prior to the termination of said agreement.

Verification: At least 15 days prior to the start of ~~ground disturbance~~Pre-Construction Site Mobilization, the project owner shall have submitted all CRHR evaluation protocols to the CPM for review and approval. CPM review will take no longer than 5 days.

At least 60 days prior to the start of ~~ground disturbance~~Pre-Construction Site Mobilization, which would impact sites selected for further evaluation, the project owner shall have submitted all CRHR evaluation reports to the CPM for review and approval.

Project owner shall submit confidential information to the CPM, only after receiving approval from the BLM.

CUL-5 ~~Prior to the start of ground disturbance, the~~The project owner shall submit the CRMMP, as prepared by or under the direction of the CRS, to the CPM for review and approval. The CRMMP shall follow the content and organization of the draft model CRMMP, provided by the CPM, and the authors' name(s) shall appear on the title page of the CRMMP. The CRMMP shall identify general and specific measures to minimize potential impacts to sensitive cultural resources. Implementation of the CRMMP shall be the responsibility of the CRS and the project owner. Copies of the CRMMP shall reside with the CRS, alternate CRS, each CRM, and the project owner's on-site construction manager. No ground disturbance shall occur prior to CPM approval of the CRMMP, unless such activities are specifically approved by the CPM.

The CRMMP shall include, but not be limited to, the following elements and measures:

The following statement included in the Introduction: "Any discussion, summary, or paraphrasing of the Conditions of Certification in this CRMMP is intended as general guidance and as an aid to the user in understanding the Conditions and their implementation. The conditions, as written in the Commission Decision, shall supersede any summarization, description, or interpretation of the conditions in the CRMMP. The Cultural Resources Conditions of Certification from the Commission Decision are contained in Appendix A."

A proposed general research design that includes a discussion of archaeological research questions and testable hypotheses specifically applicable to the project area, and a discussion of artifact collection, retention/disposal, and curation policies as related to the research questions formulated in the research design. The research design will specify that the preferred treatment strategy for any buried archaeological deposits is avoidance. Specific mitigation plans shall be prepared and submitted, for the review and approval of the CPM, for any unavoidable significant effects to archaeological resource types, type groups, or large-scale archaeological resources determined by the process in **CUL4** to be eligible for listing in the CRHR. Specific mitigation plans shall also be prepared and submitted, pursuant to **CUL-6,** for the review and approval of the CPM, for the unmitigable significant effects that the project will have on U.S. Route 66, and for any other significant effects that the project may have on other significant built-environment resources. Prescriptive treatment plans for construction-related discoveries may also be included in the CRMMP for limited archaeological resource types.

Indication of how recovered materials and records will be disposed, taking into account the expressed wishes of the consulting Native Americans.

Inclusion of a schedule for providing the consulting Native Americans with periodic updates on implementation of the Treatment Plan. Inclusion of a schedule for completing a final data recovery and discovery report and specify when and to whom this report will be distributed.

Inclusion of a curation agreement that ensures that all materials (other than Native American human remains and grave-associated materials) and records are maintained in accordance with 36 CFR Part 79. Materials recovered from privately owned lands, other than Native American human remains and grave-associated materials, that are to be returned to their owners, will be maintained in accordance with 36 CFR Part 79 until their analysis is completed.

Specification of the manner in which human remains and grave-associated artifacts recovered during data recovery or discovered during subsequent construction will be treated according to the applicable laws and regulations, and in consultation with the wishes of the consulting Native Americans.

Specification of the implementation sequence and the estimated time frames needed to accomplish all project-related tasks during the ground-disturbance and post-ground–disturbance analysis phases of the project.

9. Identification of the person(s) expected to perform each of the tasks, their responsibilities, and the reporting relationships between project construction management and the mitigation and monitoring team.

10 A description of the manner in which Native American observers or monitors will be included, the procedures to be used to select them, and their role and responsibilities.

A description of all impact-avoidance measures (such as flagging or fencing) to prohibit or otherwise restrict access to sensitive resource areas that are to be avoided during ground disturbance, construction, and/or operation, and identification of areas where these measures are to be implemented. The description shall address how these measures would be implemented prior to the start of ground disturbance and how long they would be needed to protect the resources from project-related effects.

A statement that all encountered cultural resources over 50 years old shall be recorded on Department of Parks and Recreation (DPR) 523 forms and mapped and photographed. In addition, all archaeological materials retained as a result of the archaeological investigations (survey, testing, data recovery) shall be curated in accordance with the California State Historical Resources Commission's *Guidelines for the Curation of Archaeological Collections,* into a retrievable storage collection in a public repository or museum. A statement that the project owner will pay all curation fees for artifacts recovered and for related documentation produced during cultural resources investigations conducted for the project. The project owner shall identify three possible curation facilities that could accept cultural resources materials resulting from project activities.

A statement that the CRS has access to equipment and supplies necessary for site mapping, photography, and recovery of any cultural resource materials that are encountered during ground disturbance and cannot be treated prescriptively.

A description of the contents, format, and review and approval process of the final Cultural Resource Report (CRR), which shall be prepared according to ARMR guidelines.

Verification: Upon approval of the CRS proposed by the project owner, the CPM will provide to the project owner an electronic copy of the draft model CRMMP for the CRS.

At least 30 days prior to the start of ground disturbance, the project owner shall submit the CRMMP to the CPM for review and approval.

At least 30 days prior to the start of ground disturbance, in a letter to the CPM, the project owner shall agree to pay curation fees for any materials generated or collected as a result of the archaeological investigations (survey, testing, and data recovery).

Within 90 days after completion of ground disturbance (including landscaping), if cultural materials requiring curation were generated or collected, the project owner shall provide to the CPM a copy of an agreement with, or other written commitment

from, a curation facility that meets the standards stated in the California State Historical Resources Commission's *Guidelines for the Curation of Archaeological Collections,* to accept the cultural materials from this project. Any agreements concerning curation will be retained and available for audit for the life of the project.

Project owner shall submit confidential information to the CPM, only after receiving approval from the BLM.

CUL-6 ~~Prior to the start of ground disturbance the project owner shall complete Historic American Landscape Survey (HALS) large-format photographs (with negatives), and sketch plan(s) of the 9-mile long segment of U.S. Route 66, including its landscape, viewshed, and character-defining features within the project area visible from the roadway. In total, no more than fifteen negatives will be prepared. Photographs shall be keyed to a locational map, which shall also include any bridges or culverts associated with the road. The project owner shall also complete written HALS Level II documentation of the aforementioned segment of Route 66. The project owner shall ensure that archivally stable original photographs and negatives (HALS Level III), and written documentation (HALS Level II) are submitted to the following repositories and agencies for archival storage and public use: California Historical Resources Information System (CHRIS) (to receive the original set), the County of San Bernardino, California Energy Commission, and the Bureau of Land Management. The project owner shall be responsible for any associated curation fees. Documentation may also be submitted to the HALS program for archival storage.~~

~~Documentation shall adhere to the established HALS recordation guidelines and be undertaken and completed by a person meeting the U.S. Secretary of Interior's Professional Qualifications Standards for historic landscape architecture, or history or architectural history with a demonstrated knowledge of the documentation and evaluation of historic landscapes, as published in Title 36, Code of Federal Regulations, part 61 (36 C.F.R., part 61) and a qualified architectural photographer. The resumes of the qualified personnel and architectural photographer shall include the names and telephone numbers of contacts familiar with their work on referenced projects and demonstrate to the satisfaction of the CPM that the qualified personnel and architectural photographer have the appropriate training and experience to effectively implement this condition.~~

~~The project owner shall submit the final HALS level photographic and written documentation to the CPM for review and approval. The final written report shall be provided in the format specified by the HALS Level II guidelines and photographic documentation shall be provided in the format specified by HALS~~

~~Level III guidelines. The project owner may undertake the HALS recordation activities prior to certification, at their own risk, as a means of advantaging the schedule.~~

~~The HALS documentation shall be submitted to a local repository, approved by the CPM, to be displayed in an area easily accessible by the public. The display shall include photographs of the project site and include a written history of Route 66 and its significance in the eastern Mojave, to be reviewed and approved by the CPM prior to submission.~~

~~Should~~

Project owner executed an agreement document~~ be executed in consideration of the proposed action~~ pursuant to 36 CFR §§ 800.6 or 800.14(b) ~~among~~with the Bureau of Land Management or other Federal agencies, and the California State Historic Preservation Officer, ~~with or without the participation of the Advisory Council on Historic Preservation, and should that document provide for equivalent or more intensive~~which provides for HALS Level I or II documentation ~~than the requirements set out above, as determined by the CPM, then the applicant shall adhere to the more stringent requirements in the executed agreement document~~ to mitigate the significant effects of the proposed action on US Route 66. ~~Under this scenario, the requirements as set out in the executed agreement document, as they apply to project-related impacts to US Route 66, would supersede any lesser requirements set out above and those lesser requirements would have no further force or effect. Should the executed agreement document be amended in such a manner that the mitigation measures for project-related impacts to US Route 66 become less stringent than those set out above, as determined by the CPM, or should the agreement document be terminated prior to the complete implementation of the project-related US Route 66 mitigation measures set out in it, then the project owner shall implement all of the above requirements, in addition to any measures set out under the amended agreement document and in addition to any measures that may have been partially completed prior to the termination of said agreement.~~

Verification: At least ~~25~~30 days prior to the start of ~~ground disturbance~~Pre-Construction Site Mobilization, the project owner shall submit ~~the resume for the qualified personnel and architectural photographer to the CPM for review and approval. CPM review will take no longer than 5 working days.~~verification to the CPM that the agreement document has been executed and the project owner is in compliance with the terms of the agreement document.

~~Within 10 days after CPM approval of the HALS report, the project owner shall provide documentation to the CPM confirming that copies of the final report have been provided to CHRIS, County of San Bernardino, and Bureau of Land Management.~~

~~Within 90 days following initial ground disturbance, the project owner shall submit the Level III HALS large format photographs (with negatives), sketch plan(s) and locational map to the CPM for review and approval.~~

~~Within 3 years following the start of ground disturbance, the project owner shall submit the final Level II HALS written report to the CPM for review and approval.~~

~~Within 60 days following CPM approval of the Level II HALS report, the project owner shall provide documentation to the CPM confirming that copies of the final report and copies of the photographs have been provided to CHRIS, County of San Bernardino, and the Bureau of Land Management.~~

CUL-7 The project owner shall submit the final Cultural Resources Report (CRR) to the CPM for approval. The final CRR shall be written by or under the direction of the CRS and shall be provided in the ARMR format. The final CRR shall report on all field activities including dates, times and locations, results, samplings, and analyses. All survey reports, Department of Parks and Recreation (DPR) 523 Series forms, data recovery reports, and any additional research reports not previously submitted to the California Historical Resource Information System (CHRIS) and the State Historic Preservation Officer (SHPO) shall be included as appendices to the final CRR.

If the project owner requests a suspension of ground disturbance and/or construction activities, then a draft CRR that covers all cultural resources activities associated with the project shall be prepared by the CRS and submitted to the CPM for review and approval on the same day as the suspension/extension request. The draft CRR shall be retained at the project site in a secure facility until ground disturbance and/or construction resumes or the project is withdrawn. If the project is withdrawn, then a final CRR shall be submitted to the CPM for review and approval at the same time as the withdrawal request.

Verification: Within 30 days after requesting a suspension of construction activities, the project owner shall submit a draft CRR to the CPM for review and approval. Project owner shall submit confidential information to the CPM, only after receiving approval from the BLM.

Within 90 days after completion of ~~ground disturbance (including landscaping)~~Pre-Construction Site Mobilization, the project owner shall submit the final CRR to the CPM for review and approval. If any reports have previously been sent to the CHRIS,

then receipt letters from the CHRIS or other verification of receipt shall be included in an appendix.

Within 10 days after CPM approval of the CRR, the project owner shall provide documentation to the CPM confirming that copies of the final CRR have been provided to the SHPO, the CHRIS, the curating institution, if archaeological materials were collected, and to the Tribal Chairpersons of any Native American groups requesting copies of project-related reports.

CUL-8 ~~Prior to and for the duration of ground disturbance, the~~The project owner shall provide Worker Environmental Awareness Program (WEAP) training to all new workers within their first week of employment at the project site, along the linear facilities routes, and at laydown areas, roads, and other ancillary areas. The training shall be prepared by the CRS, may be conducted by any member of the archaeological team, and may be presented in the form of a video. The CRS shall be available (by telephone or in person) to answer questions posed by employees. The training may be discontinued when ground disturbance is completed or suspended, but must be resumed when ground disturbance, such as landscaping, resumes.

The training shall include:

A discussion of applicable laws and penalties under the law;

Samples or visuals of artifacts that might be found in the project vicinity;

A discussion of what such artifacts may look like when partially buried, or wholly buried and then freshly exposed;

A discussion of what prehistoric and historical archaeological deposits look like at the surface and when exposed during construction, and the range of variation in the appearance of such deposits;

5. Instruction that the CRS, alternate CRS, and CRMs have the authority to halt ground disturbance in the area of a discovery to an extent sufficient to ensure that the resource is protected from further impacts, as determined by the CRS;

Instruction that employees are to halt work on their own in the vicinity of a potential cultural resources discovery and shall contact their supervisor and the CRS or CRM, and that redirection of work would be determined by the construction supervisor and the CRS;

An informational brochure that identifies reporting procedures in the event of a discovery;

An acknowledgement form signed by each worker indicating that they have received the training; and

A sticker that shall be placed on hard hats indicating that environmental training has been completed.

No ground disturbance shall occur prior to implementation of the WEAP program, unless such activities are specifically approved by the CPM.

Verification: At least 30 days prior to the ~~beginning of ground disturbance~~start of Pre-Construction Site Mobilization, the CRS shall provide the training program draft text and graphics and the informational brochure to the CPM for review and approval.

At least 15 days prior to the ~~beginning of ground disturbance~~start of Pre-Construction Site Mobilization, the CPM will provide to the project owner a WEAP Training Acknowledgement form for each WEAP-trained worker to sign.

Monthly, until ground disturbance is completed, the project owner shall provide in the Monthly Compliance Report (MCR) the WEAP Training Acknowledgement forms of workers who have completed the training in the prior month and a running total of all persons who have completed training to date.

CUL-9 The project owner shall ensure that the CRS, alternate CRS, or CRMs monitor full time all ground disturbance at the project site, along the linear facilities routes, and at laydown areas, roads, and other ancillary areas, to ensure there are no impacts to undiscovered resources and to ensure that known resources are not impacted in an unanticipated manner.

Full-time archaeological monitoring for this project shall be the archaeological monitoring of ground disturbance for as long as the activities are ongoing. An archaeological monitor shall be made available to observe both the active ground-disturbance/excavation of soils, as well as the disposal of any removed soils. The number of monitors required shall be determined by the CRS. It is anticipated that during the monitoring effort the archaeological monitors will be moving in and around the construction equipment in order to meaningfully inspect the soils. The archaeological monitors shall observe the ground-disturbance and/or soil disposal activities within a close enough distance to reasonably allow for the detection of cultural artifacts and/or features that could potentially be unearthed during construction, no farther away than 50 feet, or as otherwise directed by the CPM.

A Native American monitor shall be invited to monitor ground disturbance, in the presence of an archaeological monitor, in areas where Native American artifacts may be discovered. Contact lists of interested Native Americans and guidelines for monitoring shall be obtained from the Native American Heritage Commission. Preference in selecting a monitor shall be given to Native Americans with traditional ties to the area that shall be monitored. If efforts to obtain the services of a qualified Native American monitor are unsuccessful, the project owner shall immediately inform the

CPM. The CPM will either identify potential monitors or will allow ground disturbance to proceed without a Native American monitor.

The research design in the CRMMP shall govern the collection, treatment, retention/disposal, and curation of any archaeological materials encountered.

On forms provided by the CPM, CRMs shall keep a daily log of any monitoring and other cultural resources activities and any instances of non-compliance with the Conditions and/or applicable LORS. Copies of the daily monitoring logs shall be provided by the CRS to the CPM, if requested by the CPM. From these logs, the CRS shall compile a monthly monitoring summary report to be included in the MCR. If there are no monitoring activities, the summary report shall specify why monitoring has been suspended.

The CRS or alternate CRS shall report daily to the CPM on the status of the project's cultural resources-related activities, unless reducing or ending daily reporting is requested by the CRS and approved by the CPM.

In the event that the CRS believes that the current level of monitoring is not appropriate in certain locations, a letter or e-mail detailing the justification for changing the level of monitoring shall be provided to the CPM for review and approval prior to any change in the level of monitoring.

The CRS, at his or her discretion, or at the request of the CPM, may informally discuss cultural resources monitoring and mitigation activities with Energy Commission technical staff.

Cultural resources monitoring activities are the responsibility of the CRS. Any interference with monitoring activities, removal of a monitor from duties assigned by the CRS, or direction to a monitor to relocate monitoring activities by anyone other than the CRS shall be considered non-compliance with these Conditions.

Upon becoming aware of any incidents of non-compliance with the Conditions and/or applicable LORS, the CRS and/or the project owner shall notify the CPM by telephone or e-mail within 24 hours. The CRS shall also recommend corrective action to resolve the problem or achieve compliance with the Conditions. When the issue is resolved, the CRS shall write a report describing the issue, the resolution of the issue, and the effectiveness of the resolution measures. This report shall be provided in the next MCR for the review of the CPM.

Verification: At least 15 days prior to the start of ~~ground disturbance~~Pre-Construction Site Mobilization, the CPM will provide to the CRS an electronic copy of a form to be used as a daily monitoring log.

Monthly, while monitoring is on-going, the project owner shall include in each MCR a copy of the monthly summary report of cultural resources-related monitoring

prepared by the CRS and shall attach any new DPR 523A forms completed for finds treated prescriptively, as specified in the CRMMP.

At least 24 hours prior to implementing a proposed change in monitoring level, the project owner shall submit to the CPM, for review and approval, a letter or email (or some other form of communication acceptable to the CPM) detailing the CRS's justification for changing the monitoring level.

Daily, as long as no cultural resources are found, the CRS shall provide a statement that "no cultural resources over 50 years of age were discovered" to the CPM as an e-mail or in some other form of communication acceptable to the CPM.

At least 24 hours prior to reducing or ending daily reporting, the project owner shall submit to the CPM, for review and approval, a letter or e-mail (or some other form of communication acceptable to the CPM) detailing the CRS's justification for reducing or ending daily reporting.

No later than 30 days following the discovery of any Native American cultural materials, the project owner shall submit to the CPM copies of the information transmittal letters sent to the Chairpersons of the Native American tribes or groups who requested the information. Additionally, the project owner shall submit to the CPM copies of letters of transmittal for all subsequent responses to Native American requests for notification, consultation, and reports and records.

Within 15 days of receiving them, the project owner shall submit to the CPM copies of any comments or information provided by Native Americans in response to the project owner's transmittals of information.

Project owner shall submit confidential information to the CPM, only after receiving approval from the BLM.

CUL-10 The project owner shall grant authority to halt ground disturbance to the CRS, alternate CRS, and the CRMs in the event of a discovery. Redirection of ground disturbance shall be accomplished under the direction of the construction supervisor in consultation with the CRS.

In the event that a cultural resource over 50 years of age is found (or if younger, determined exceptionally significant by the CPM), or impacts to such a resource can be anticipated, ground disturbance shall be halted or redirected in the immediate vicinity of the discovery sufficient to ensure that the resource is protected from further impacts. Monitoring and daily reporting, as provided in other conditions, shall continue during the project's ground-disturbing activities elsewhere. The halting or redirection of ground disturbance shall remain in effect until the CRS has visited the discovery, and all of the following have occurred:

The CRS has notified the project owner, and the CPM has been notified within 24 hours of the discovery, or by Monday morning if the cultural resources discovery occurs between 8:00 AM on Friday and 8:00 AM on Sunday morning, including a description of the discovery (or changes in character or attributes), the action taken (i.e., work stoppage or redirection), a recommendation of CRHR eligibility, and recommendations for data recovery from any cultural resources discoveries, whether or not a determination of CRHR eligibility has been made.

If the discovery would be of interest to Native Americans, the CRS has notified all Native American groups that expressed a desire to be notified in the event of such a discovery.

The CRS has completed field notes, measurements, and photography for a DPR 523 "Primary" form. Unless the find can be treated prescriptively, as specified in the CRMMP, the "Description" entry of the DPR 523 "Primary" form shall include a recommendation on the CRHR eligibility of the discovery. The project owner shall submit completed forms to the CPM.

The CRS, the project owner, and the CPM have conferred, and the CPM has concurred with the recommended eligibility of the discovery and approved the CRS's proposed data recovery, if any, including the curation of the artifacts, or other appropriate mitigation; and any necessary data recovery and mitigation have been completed.

Verification: At least 15 days prior to the start of ~~ground disturbance~~Pre-Construction Site Mobilization, the project owner shall provide the CPM and CRS with a letter confirming that the CRS, alternate CRS, and CRMs have the authority to halt ground disturbance in the vicinity of a cultural resources discovery, and that the project owner shall ensure that the CRS notifies the CPM within 24 hours of a discovery, or by Monday morning if the cultural resources discovery occurs between 8:00 AM on Friday and 8:00 AM on Sunday morning.

Within 48 hours of the discovery of a resource of interest to Native Americans, the project owner shall ensure that the CRS notifies all Native American groups that expressed a desire to be notified in the event of such a discovery. Unless the discovery can be treated prescriptively, as specified in the CRMMP, completed DPR 523 forms for resources newly discovered during ground disturbance shall be submitted to the CPM for review and approval no later than 24 hours following the notification of the CPM, or 48 hours following the completion of data recordation/recovery, whichever the CRS decides is more appropriate for the subject cultural resource.

Project owner shall submit confidential information to the CPM, only after receiving approval from the BLM.

CUL-11: If human remains are encountered, State Health and Safety Code Section 7050.5 states that no further disturbance shall occur until the County Coroner has made necessary findings as to origin and disposition of the remains pursuant to Public Resources Code Section 5097.98. The following actions, or other equally protective actions provided for in the Native American Grave Protection and Repatriation Act or the Programmatic Agreement, must be taken in the event that human remains are discovered on Federal, private or State land:

Stop work immediately and contact the County Coroner must be notified immediately of the find and the BLM archaeologist shall be notified concurrently.

The Coroner has two working days to examine human remains after being notified by the responsible person. If the remains are determined to be prehistoric of Native American origin, the BLM will notify the Native American Heritage Commission,

The Native American Heritage Commission will immediately notify the person it believes to be the most likely descendent of the deceased Native American. With the permission of the landowner or agency or an authorized representative, the MLD may inspect the site of the discovery; and

The most likely descendent makes recommendations to the owner, or representative, for the treatment or disposition, with proper dignity, of the human remains and grave goods.

If the commission is unable to identify a descendent, or the descendent identified fails to make a recommendation, or the landowner rejects the recommendations of the descendent and the mediation provided for in subdivision (k) of Section 5097.94 fails to provide measures acceptable to the landowner, the landowner or his or her authorized representative shall reinter the human remains and items associated with the Native American burial(s) with appropriate dignity on the property in a location not subject to further subsurface disturbance.

4.7.7 References Cited

No references other than those presented in the Approved Project record were used in the preparation of this analysis.

4.8 PALEONTOLOGICAL RESOURCES

As described in detail below impacts of the Modified Project to paleontological resources are expected to be less than or equal to those of the Approved Project and will remain less than significant.

4.8.1 Summary of Project Changes Related to Paleontological Resources

The Modified Project includes the same 4,613 acres as the Approved Project. Construction of the Modified Project would disturb the same surface area as the Approved Project and permanent ground disturbance would be reduced. Under the Modified Project, the maximum cut depth would be 45 feet, which is the same as the Approved Project.

4.8.2 Changes in Environmental Impacts

The Commission Decision concluded that with implementation of Conditions, the Approved Project would cause no significant impact to paleontological resources. Because the geologic setting, Project boundaries, depth of excavation, extent of construction, and levels of disturbance have either not changed or been reduced under the Modified Project, the Modified Project would result in no additional impacts to paleontological resources in the Project area.

4.8.3 Changes in Cumulative Effects

The Commission Decision concluded that the Approved Project would not result in any significant cumulative impacts to paleontological resources. Incremental impacts of the Modified Project on paleontological resources are expected to be the same or slightly reduced compared to the Approved Project. As described in Section 4.23, Cumulative Scenario, no new reasonably foreseeable future actions beyond those assumed in the Commission Decision have been identified. Therefore, no increase in cumulative impacts under the Modified Project is anticipated.

4.8.4 Changes in LORS Conformance and Other Permits

In the Commission Decision, the Commission concluded that, with the implementation of the Conditions, the Approved Project would comply with all applicable LORS. As with the Approved Project, the Modified Project would comply with all applicable LORS, and no new or additional LORS have been identified.

Neither state nor county agencies require a paleontological collecting permit to allow for the salvage of fossil remains discovered as a result of construction-related earth moving on state or private land at a Project site. However, much of the proposed Project site is located on land managed by the BLM, and that agency requires any entity salvaging significant fossil resources on those lands to have a Scientific Paleontological Collecting Permit from the California State BLM office and a Fieldwork Authorization from the Barstow BLM Field Office. The situation for required permits for the Modified Project would be identical to that of the Approved Project, thus, no changes in permitting of the Project would be required.

4.8.5 Changes in Proposed Mitigation

No new or more severe impacts requiring additional mitigation would result from the Modified Project. The mitigation measures proposed in the Commission Decision would mitigate impacts associated with the Modified Project to levels that would be less than significant.

4.8.6 Changes in Conditions of Certification

The conforming changes to the Conditions for the Modified Project related to paleontological resources are:

PAL-1 The project owner shall provide the Compliance Project Manager CPM with the resume and qualifications of its paleontological resource specialist (PRS) for review and approval. If the approved PRS is replaced prior to completion of project mitigation and submittal of the Paleontological Resources Report, the project owner shall obtain CPM approval of the replacement PRS. The project owner shall keep resumes on file for qualified paleontological resource monitors (PRMs). If a PRM is replaced, the resume of the replacement PRM shall also be provided to the CPM.

The PRS resume shall include the names and phone numbers of references. The resume shall also demonstrate to the satisfaction of the CPM the appropriate education and experience to accomplish the required paleontological resource tasks.

As determined by the CPM, the PRS shall meet the minimum qualifications for a vertebrate paleontologist as described in the Society of Vertebrate Paleontology (SVP) guidelines of 1995. The experience of the PRS shall include the following:

Institutional affiliations, appropriate credentials, and college degree;

Ability to recognize and collect fossils in the field;

Local geological and biostratigraphic expertise;

Proficiency in identifying vertebrate and invertebrate fossils; and

At least three years of paleontological resource mitigation and field experience in California and at least one year of experience leading paleontological resource mitigation and field activities.

The project owner shall ensure that the PRS obtains qualified paleontological resource monitors to monitor as he or she deems necessary on the project. Paleontological resource monitors (PRM) shall have the equivalent of the following qualifications:

BS or BA degree in geology or paleontology and one year of experience monitoring in California; or

AS or AA in geology, paleontology, or biology and four years' experience monitoring in California; or

Enrollment in upper division classes pursuing a degree in the fields of geology or paleontology and two years of monitoring experience in California.

Verification: At least 30 days prior to the start of ~~ground disturbance~~Pre-Construction Site Mobilization, the project owner shall submit a resume and statement of availability of its designated PRS for on-site work.

At least 20 days prior to ~~ground disturbance~~start of Pre-Construction Site Mobilization, the PRS or project owner shall provide a letter with resumes naming anticipated monitors for the project, stating that the identified monitors meet the minimum qualifications for paleontological resource monitoring required by the Condition. If additional monitors are obtained during the project, the PRS shall provide additional letters and resumes to the CPM. The letter shall be provided to the CPM no later than one week prior to the monitor's beginning on-site duties.

Prior to the termination or release of a PRS, the project owner shall submit the resume of the proposed new PRS to the CPM for review and approval.

PAL-2 The project owner shall provide to the PRS and the CPM, for approval, maps and drawings showing the footprint of the power plant, construction lay-down areas, and all related facilities. Maps shall identify all areas of the project where ground disturbance is anticipated. If the PRS requests enlargements or strip maps for linear facility routes, the project owner shall provide copies to the PRS and CPM. The site grading plan and plan and profile drawings for the utility lines would be acceptable for this purpose. The plan drawings should show the location, depth, and extent of all ground disturbances and be at a scale between 1 inch = 40 feet and 1 inch = 100 feet. If the footprint of the project or its linear facilities changes, the project owner shall provide maps and drawings reflecting those changes to the PRS and CPM.

If construction of the project proceeds in phases, maps and drawings may be submitted prior to the start of each phase. A letter identifying the proposed schedule of each project phase shall be provided to the PRS and CPM. Before work commences on affected phases, the project owner shall notify the PRS and CPM of any construction phase scheduling changes.

At a minimum, the project owner shall ensure that the PRS or PRM consults weekly with the project superintendent or construction field manager to confirm

area(s) to be worked the following week and until ground disturbance is completed.

Verification: At least 30 days prior to the start of ~~ground disturbance~~Pre-Construction Site Mobilization, the project owner shall provide the maps and drawings to the PRS and CPM.

If there are changes to the footprint of the project, revised maps and drawings shall be provided to the PRS and CPM at least 15 days prior to the start of ~~ground disturbance~~Pre-Construction Site Mobilization.

If there are changes to the scheduling of the construction phases, the project owner shall submit a letter to the CPM within 5 days of identifying the changes.

PAL-3 The project owner shall ensure that the PRS prepares, and the project owner submits to the CPM for review and approval, a PRMMP to identify general and specific measures to minimize potential impacts to significant paleontological resources. Approval of the PRMMP by the CPM shall occur prior to any ground disturbance. The PRMMP shall function as the formal guide for monitoring, collecting, and sampling activities and may be modified with CPM approval. This document shall be used as the basis of discussion when on-site decisions or changes are proposed. Copies of the PRMMP shall reside with the PRS, each monitor, the project owner's on-site manager, and the CPM.

The PRMMP shall be developed in accordance with the guidelines of the SVP (1995) and shall include, but not be limited, to the following:

Assurance that the performance and sequence of project-related tasks, such as any literature searches, pre-construction surveys, worker environmental training, fieldwork, flagging or staking, construction monitoring, mapping and data recovery, fossil preparation and collection, identification and inventory, preparation of final reports, and transmittal of materials for curation will be performed according to PRMMP procedures;

Identification of the person(s) expected to assist with each of the tasks identified within the PRMMP and the Conditions of Certification;

A thorough discussion of the anticipated geologic units expected to be encountered, the location and depth of the units relative to the project when known, and the known sensitivity of those units based on the occurrence of fossils either in that unit or in correlative units;

An explanation of why, how, and how much sampling is expected to take place and in what units. Include descriptions of different sampling procedures that shall be used for fine-grained and coarse-grained units;

A discussion of the locations of where the monitoring of project construction activities is deemed necessary, and a proposed plan for monitoring and sampling;

A discussion of procedures to be followed in the event of a significant fossil discovery, halting construction, resuming construction, and how notifications will be performed;

A discussion of equipment and supplies necessary for collection of fossil materials and any specialized equipment needed to prepare, remove, load, transport, and analyze large-sized fossils or extensive fossil deposits;

Procedures for inventory, preparation, and delivery for curation into a retrievable storage collection in a public repository or museum, which meet the Society of Vertebrate Paleontology's standards and requirements for the curation of paleontological resources;

9. Identification of the institution that has agreed to receive data and fossil materials collected, requirements or specifications for materials delivered for curation and how they will be met, and the name and phone number of the contact person at the institution; and 10. A copy of the paleontological Conditions of Certification.

Verification: At least 30 days prior to ~~ground disturbance~~start of Pre-Construction Site Mobilization, the project owner shall provide a copy of the PRMMP to the CPM. The PRMMP shall include an affidavit of authorship by the PRS and acceptance of the PRMMP by the project owner evidenced by a signature.

PAL-4 Prior to ground disturbance and for the duration of construction activities involving ground disturbance, the project owner and the PRS shall prepare and conduct weekly CPM-approved training for the following workers: project managers, construction supervisors, foremen, and general workers involved with or who operate ground-disturbing equipment or tools. Workers shall not excavate in sensitive units prior to receiving CPM-approved worker training. Worker training shall consist of an initial in-person PRS training during the project kick off for those mentioned above. Following initial training, a CPM approved video or in-person training may be used for new employees. The training program may be combined with other training programs prepared for cultural and biological resources, hazardous materials, or other areas of interest or concern. No ground disturbance shall occur prior to CPM approval of the Worker Environmental Awareness Program (WEAP), unless specifically approved by the CPM.

The WEAP shall address the possibility of encountering paleontological resources in the field, the sensitivity and importance of these resources, and legal obligations to preserve and protect those resources.

The training shall include:

A discussion of applicable laws and penalties under the law;

Good quality photographs or physical examples of vertebrate fossils for project sites containing units of high paleontological sensitivity;

Information that the PRS or PRM has the authority to halt or redirect construction in the event of a discovery or unanticipated impact to a paleontological resource;

Instruction that employees are to halt or redirect work in the vicinity of a find and to contact their supervisor and the PRS or PRM;

An informational brochure that identifies reporting procedures in the event of a discovery;

A WEAP certification of completion form signed by each worker indicating that he/she has received the training; and

7. A sticker that shall be placed on hard hats indicating that environmental training has been completed.

Verification: At least 30 days prior to ~~ground disturbance~~start of Pre-Construction Site Mobilization, the project owner shall submit the proposed WEAP, including the brochure, with the set of reporting procedures for workers to follow.

At least 30 days prior to ~~ground disturbance~~start of Pre-Construction Site Mobilization, the project owner shall submit the script and final video to the CPM for approval if the project owner is planning to use a video for interim training.

If the owner requests an alternate paleontological trainer, the resume and qualifications of the trainer shall be submitted to the CPM for review and approval prior to installation of an alternate trainer. Alternate trainers shall not conduct training prior to CPM authorization.

In the monthly compliance report (MCR), the project owner shall provide copies of the WEAP certification of completion forms with the names of those trained and the trainer or type of training (in-person or video) offered that month. The MCR shall also include a running total of all persons who have completed the training to date.

PAL-5 The project owner shall ensure that the PRS and PRM(s) monitor consistent with the PRMMP all construction-related grading, excavation, trenching, and augering in areas where potential fossil-bearing materials have been identified, both at the site and along any constructed linear facilities associated with the project. In the event that the PRS determines full-time monitoring is not necessary in locations that were identified as potentially fossil bearing in the PRMMP, the project owner shall notify and seek the concurrence of the CPM.

The project owner shall ensure that the PRS and PRM(s) have the authority to halt or redirect construction if paleontological resources are encountered. The project owner shall ensure that there is no interference with monitoring activities unless directed by the PRS. Monitoring activities shall be conducted as follows:

Any change of monitoring from the accepted schedule in the PRMMP shall be proposed in a letter or email from the PRS and the project owner to the CPM prior to the change in monitoring and will be included in the monthly compliance report. The letter or email shall include the justification for the change in monitoring and be submitted to the CPM for review and approval.

The project owner shall ensure that the PRM(s) keep a daily monitoring log of paleontological resource activities. The PRS may informally discuss paleontological resource monitoring and mitigation activities with the CPM at any time.

3. The project owner shall ensure that the PRS notifies the CPM within 24 hours of the occurrence of any incidents of noncompliance with any **Paleontological Resources** Conditions of Certification. The PRS shall recommend corrective action to resolve the issues or achieve compliance with the conditions of certification.

4. For any significant paleontological resources encountered, either the project owner or the PRS shall notify the CPM within 24 hours, or Monday morning in the case of a weekend event, where construction has been halted because of a paleontological find.

The project owner shall ensure that the PRS prepares a summary of monitoring and other paleontological activities placed in the monthly compliance reports. The summary will include the name(s) of PRS or PRM(s) active during the month; general descriptions of training and monitored construction activities; and general locations of excavations, grading, and other activities. A section of the report shall include the geologic units or subunits encountered, descriptions of samplings within each unit, and a list of identified fossils. A final section of the report will address any issues or concerns about the project relating to paleontological monitoring, including any incidents of non-compliance or any changes to the monitoring plan that have been approved by the CPM. If no monitoring took place during the month, the report shall include an explanation in the summary as to why monitoring was not conducted.

Verification: The project owner shall ensure that the PRS submits the summary of monitoring and paleontological activities in the MCR. When feasible, the CPM shall

be notified 10 days in advance of any proposed changes in monitoring different from the plan identified in the PRMMP. If there is any unforeseen change in monitoring, the notice shall be given as soon as possible prior to implementation of the change.

PAL-6 The project owner, through the designated PRS, shall ensure that all components of the PRMMP are adequately performed including collection of fossil materials, preparation of fossil materials for analysis, analysis of fossils, identification and inventory of fossils, the preparation of fossils for curation, and the delivery for curation of all significant paleontological resource materials encountered and collected during project construction.

Verification: The project owner shall maintain in his/her compliance file copies of signed contracts or agreements with the designated PRS and other qualified research specialists. The project owner shall maintain these files for a period of three years after project completion and approval of the CPM-approved paleontological resource report (see Condition of Certification **PAL-7).** The project owner shall be responsible for paying any curation fees charged by the museum for fossils collected and curated as a result of paleontological mitigation. A copy of the letter of transmittal submitting the fossils to the curating institution shall be provided to the CPM.

PAL-7 The project owner shall ensure preparation of a Paleontological Resources Report (PRR) by the designated PRS. The PRR shall be prepared following completion of the ground-disturbing activities. The PRR shall include an analysis of the collected fossil materials and related information and submit it to the CPM for review and approval.

The report shall include, but is not limited to, a description and inventory of recovered fossil materials; a map showing the location of paleontological resources encountered; determinations of sensitivity and significance; and a statement by the PRS that project impacts to paleontological resources have been mitigated below the level of significance.

Verification: Within 90 days after completion of ~~ground-disturbing activities~~project construction, including landscaping, the project owner shall submit the PRR under confidential cover to the CPM.

4.8.7 References Cited

No references other than those presented in the Approved Project's record were used in the preparation of this analysis.

4.9 LAND USE

As described in detail below impacts of the Modified Project to land use are expected to remain the same as those of the Approved Project.

4.9.1 Summary of Project Changes Related to Land Use

No changes to the affected environment (i.e. existing land uses, General Plan, Zoning, etc.) would occur under the Modified Project. No changes would occur that would result in different impacts, LORS conformance, mitigation, or Conditions for land use. The site location, acreage, and MW are the same as those analyzed and approved in the Commission Decision.

4.9.2 Changes in Environmental Impacts

The Modified Project would not result in a significant impact or change to the land use findings relative to the Approved Project. Specifically, the Modified Project would not:

- result in impacts to farmland or rangeland areas and would not contribute to loss of productive farmland;
- physically divide an established community;
- conflict with applicable land use plans, policies, or regulations; or
- conflict with an applicable habitat conservation plan.

The Modified Project is not anticipated to require a height increase from the maximum 90-foot-high and 110-foot-high transmission towers proposed under the Approved Project and analyzed in the Commission Decision, as the change in technology proposes towers consistent with the height and scale of those described in the Approved Project. Further, because the substation would be relocated under the Modified Project, fewer towers would be necessary to transmit power to the Pisgah substation. Thus, no new effects to aircraft operation are expected.

In October 2010, the BLM issued a Record of Decision for the Project and Amendment to the California Desert Conservation Area (CDCA) Land Use Management Plan. The Project site, acreage, and output would not change, under the Modified Project, from what was approved by the BLM. Therefore, the Modified Project would not require an additional amendment to the CDCA Plan.

In the Commission Decision, the Commission concluded that there were no significant adverse direct land use impacts (Commission Decision, Section VII, A, page 13). Under the Modified Project, the site boundary, acreage, and output would be the same as approved in the Commission Decision. Therefore, the Commission Decision that the Approved Project would be consistent with surrounding land uses is expected to remain valid under the Modified Project.

4.9.3 Changes in Cumulative Environmental Impacts

The Commission Decision concluded that the Approved Project would combine with other past and reasonably foreseeable future projects to substantially reduce scenic values of wilderness areas and recreational resources in the Mojave Desert and southern California desert region, and, therefore, would result in a significant and unavoidable cumulative land use impact in this regard (Commission Decision, Section VII, A, page 13). Under the Modified Project, no new foreseeable future actions beyond those presented in the Commission Decision have been identified. Impacts on land use from the Modified Project are expected to be the same as those presented in the Commission Decision and, therefore, no additional cumulative impacts would occur.

4.9.4 Changes in LORS Conformance and Other Permits

In its Commission Decision, the Commission concluded that the Project is consistent with all applicable LORS, with the possible exception of BLM Interim Policy Memorandum (CA-2009-020) regarding lands donated to BLM or acquired with assistance from the federal Land and Water Conservation Fund. The Project site includes approximately 96 acres of donated and acquired lands in the northwest corner of Section 17 and southwest corner of Section 5. The BLM State Director recommended proceeding with authorization of solar use of the donated lands within the Project site, making the Project consistent with BLM policy regarding donated or acquired lands. The Commission Decision to approve the Project was contingent upon the grant of the ROW application, which contained BLM's determination that the Interim Policy Memorandum was satisfied. BLM granted the ROW application in October 2010, making the Approved Project consistent with all applicable LORS. The Modified Project would not require additional LORS compliance.

4.9.5 Changes in Proposed Mitigation

The Commission Decision proposed no mitigation measures for impacts to land use. No new impacts requiring mitigation would result from the Modified Project. The Modified Project would not necessitate mitigation measures, as the changes in technology under the Modified Project would be consistent with what was previously approved.

4.9.6 Changes in Conditions of Certification

The Commission Decision did not include any Conditions related to land use. The Modified Project would not necessitate Conditions, as the changes in technology under the Modified Project would be consistent with what was previously approved.

4.9.7 References Cited

Bureau of Land Management (BLM). Calico Solar Project Record of Decision and Amendment to the California Desert Conservation Area Land Use Management Plan. Located at http://www.blm.gov/ca/st/en/prog/energy/fasttrack/calico/fedstatus.html. October, 2010.

4.10 SOCIOECONOMICS

As described in detail below, socioeconomic impacts of the Modified Project are expected to be less than or equal to those of the Approved Project and will remain less than significant.

4.10.1 Summary of Project Changes Related to Socioeconomics

Compared to PV technology, SunCatchers require additional personnel to assemble and install during construction, as well as additional personnel for washing and routine maintenance functions during operation. The Modified Project involves a reduction in the number of SunCatchers and the addition of PV modules. This change in technology results in a reduction in the average numbers of construction and operation employees for the Modified Project. However, the labor categories used during construction and operation of the Modified Project would be substantially similar to those of the Approved Project. In addition, the technology change requires lower maintenance (e.g., fewer moving parts, less frequent periodic part replacement, etc.) and, therefore, a reduction in annual local expenditures for supplies.

4.10.2 Changes in Environmental Impacts

The changes to socioeconomics under the Modified Project are evaluated below. Under the Modified Project, the Project location and conditions (including the regional context) would not change from those identified in the Approved Project. Table 4.10-1 below sets forth a list of certain costs, expenditures and employee numbers for both of the Approved Project and the Modified Project.

Table 4.10-1
Project Construction and Operation: Expenditures and Average Number of Employees

Item	Approved Project	Modified Project
Capital Cost	$1 Billion	$1.875 Billion
Construction		
Approximate Total Payroll	$159 Million	$187.5 Million
Average Employees	400	340
Total Local Expenditure	$8.4 Million	$19.025 Million
Operation		
Approximate Annual Payroll	$10.1 Million	$5 Million
Average Employees	180	112
Annual Local Expenditure	$8.4 Million	$600,000

The calculation of total construction payroll is based on best professional judgment using past energy construction experience, which has shown that construction payroll is typically 10 percent of capital cost. Average construction employment is based on assumed wages and benefits for the various labor categories and staffing levels. Total local expenditures for construction are calculated based on market availability of components, materials and equipment.

Approximate annual operations payroll (hourly and salary) is calculated using assumed wages and benefits from prior plant operations staffing experience. Average operations employment is calculated to include labor categories typical for Project operations. Annual local expenditures for operations are based on budgeting experience associated with past power plant operations (e.g. fuel, solar equipment maintenance/facility supplies, etc.).

4.10.2.1 Construction Impacts

The Commission concluded that the total labor by skill in the Riverside-San Bernardino-Ontario and Los Angeles County Metropolitan Statistical Areas is more than adequate to provide construction labor for the Approved Project (Commission Decision, Section VII, C, page 2).

Under the Modified Project, typical construction trades would be required, including concrete workers, electricians, maintenance and repair workers, carpenters, equipment operators, and laborers. Much of the work would involve installing PV modules, tracking systems and SunCatchers. These construction trades correspond with the Federal Standard Occupational Classification (SOC) system categories. The SOC categories required for the Modified Project are qualitatively similar to those of the Approved Project.

Three categories of construction employment for both the Approved Project and the Modified Project (SunCatcher Technicians, SunCatcher Assemblers, and SunCatcher Material Handlers) do not directly correspond with a SOC category. These construction trades would, in most cases, require some form of on-site training. Workers recruited to fill these positions would be drawn from the same general labor pool as other members of the construction workforce. Under the Modified Project, the number of employees in these three categories would be reduced from 92 to 13 during the peak construction period.

As with the Approved Project, to the extent feasible, every effort would be made in the Modified Project to employ qualified subcontractors and construction personnel from the local area, and the majority of the labor force is expected to be hired locally (within daily commuting distance), and to commute daily to the Project site. Power plant construction workers would commute as much as two hours (one hour in each direction) to construction sites from their homes, rather than relocate (see Commission Decision, Section VII, C, page 2). The Commission found that because of the large labor force within commuting distance of the Project, the majority of construction workers would commute to the Approved Project daily from their existing residences (id.). This is also expected to be true for the Modified Project.

With the reduced number of construction workers required for the Modified Project, the total labor by skill in the regional labor market is more than adequate to provide construction labor for the Modified Project.

4.10.2.1.1 Construction Impacts on Population, Housing, Schools, and Public Services

The Commission concluded that construction of the Approved Project would not adversely impact existing housing supply (or require new housing construction), schools, parks and recreation, law enforcement, hospitals, or emergency services in the local communities. The Commission also determined that an adequate supply of motels and rental properties would be available in the city of Barstow, and in San Bernardino and Riverside Counties to accommodate weekly commuters and/or temporary residents (Commission Decision, Section VII, C, pages 2 to 3). The reduced number of

construction workers required under the Modified Project would be anticipated to result in no new or more severe impacts to the existing housing supply and local services.

4.10.2.1.2 Indirect and Induced Construction Impacts on Economy and Employment

The Commission concluded that the results of an Impact Analysis for Planning (IMPLAN) model of the Approved Project showed that purchases by construction workers and permanent employees as well as Approved Project expenditures for materials and supplies would generate quantifiable secondary economic benefits that would likely occur if the Approved Project were developed (Commission Decision, Section VII, C, page 4).

Under the Modified Project, construction is expected to require an average of 340 construction workers, and result in an estimated $19.025 million in expenditures for locally-purchased materials and supplies, which would result in secondary (indirect and induced) impacts. IMPLAN Professional Version 2.0.1025 was used to create an input/output model assessing the secondary economic impacts (indirect and induced impacts) resulting from the construction activities. The modeling impact was based on an estimated capital cost of $1.875 billion, estimated expenditures of $19.025 million for locally-purchased (i.e., San Bernardino County) materials and supplies, and 340 construction workers. The total construction worker salary under the Modified Project is estimated to be $187.5 million.

Under the Modified Project, the resulting total indirect and induced effects of the construction occurring within San Bernardino County would be an additional 97 indirect and 1,268 induced jobs generated by the local construction expenditures and construction payroll, and approximately $4,455,862 and $47,056,752 in indirect and induced income impacts, respectively (based on the total local construction expenditure for payroll, materials, and supplies). The indirect and induced output for dollars generated for other industries supplying the power generation industry was estimated at $12,732,140 and $148,708,141, respectively. Dollar estimates are provided in 2011 dollars.

Therefore, the results of the IMPLAN analysis for the Modified Project indicated that the Modified Project, like the Approved Project, would be expected to generate temporary beneficial impacts to the San Bernardino County economy.

4.10.2.1.3 Construction Impacts on Fiscal Resources

The Commission concluded that the construction payroll, local purchases of materials and supplies, and sales tax revenues generated by the expenditures associated with the Approved Project would have a temporary beneficial impact on the San Bernardino County economy (Commission Decision, Section VII, C, page 4). Under the Modified Project, estimated local expenditures of $19.025 million for construction materials and supplies would exceed those expected of the Approved Project. Assuming a current San Bernardino County tax rate of 8.75 percent, the Modified Project would generate approximately $416,172 in sales tax each year during construction. Therefore, like the Approved Project, the Modified Project would have a temporary beneficial impact on the San Bernardino County economy.

4.10.2.2 Operations Impacts

Similar to its construction phase, the Modified Project would require typical operation trades, including electricians, maintenance and repair workers, operating engineers and other equipment operators. The number of operation and maintenance employees would gradually increase until Modified Project construction is completed (see Section 2.0 for a discussion of construction timing). Once both phases of the Project were completed, the Project would employ approximately 112 full-time workers.

The Modified Project expects to draw a majority of these operation employees from areas within a two-hour commute (one hour in each direction), including the cities of Barstow and Victorville, as well as smaller communities located in the Project vicinity. Some of the positions, primarily engineering occupations, may require individuals with specialized skills who may need to be recruited from larger statewide or national labor markets. Specialized personnel recruited from outside the region would likely relocate with their families to the area (within one hour commuting distance of the Project site).

4.10.2.2.1 Operation Impacts on Population, Housing, Schools, and Public Services

The Commission concluded that 20 employees associated with operational jobs might be recruited from outside the immediate Project area and the relocation of some workers and their dependents would cause no expected adverse impacts on the local infrastructure or community services (Commission Decision, Section VII, C, page 3). To the extent feasible, every effort would be made to employ qualified operation personnel from the local area and the majority of the labor force was expected to be hired locally. However, the Modified Project might also require up to 20 specialized personnel that might need to be recruited from outside the Project area. The reduced number of operation workers required for the Modified Project would likely result in fewer effects on the local population. Operation of the Modified Project would not be expected to displace the existing population or physically divide an existing community.

The Commission concluded that some workers might relocate with their families to the Barstow area, with no expected adverse impacts on the local infrastructure or community services. Because of the large labor force within commuting distance of the Project, the majority of operation workers would commute to the Project daily from their existing residences. The Commission concluded that some workers might stay in local motels or other rental properties during the work week but return to their homes on weekends for the duration of their job assignments. The Commission determined that an adequate supply of motels and rental properties would be available in the city of Barstow, and in San Bernardino and Riverside Counties to accommodate weekly commuters and/or temporary residents (Commission Decision, Section VII, C, page 2). The Commission found that since Project-induced population changes would be minimal, operation of the Project would not result in significant adverse impacts on schools, parks and recreation, law enforcement, hospitals, or emergency services in the local communities (Commission Decision, Section VII, C, page 3). The reduced number of operation workers required for the Modified Project would be anticipated to result in fewer impacts to existing housing supply or community services.

4.10.2.2.2 Indirect and Induced Operations Impacts on Economy and Employment

The Commission concluded that the results of an IMPLAN analysis showed that purchases by permanent employees, as well as Approved Project expenditures for materials and supplies, would generate

quantifiable secondary economic benefits that would likely occur if the Project were developed (Commission Decision, Section VII, C, page 4).

Operation of the Modified Project is expected to require an average of 112 workers and approximately $600,000 in expenditures for locally purchased materials and supplies during the first year of operation. The induced and indirect economic impacts were modeled (IMPLAN Professional) based on an estimated annual operation budget of $6,162,000, expenditures of approximately $600,000 for locally purchased (i.e., San Bernardino County) materials and supplies, a total annual salary for operational workers of $4,970,000, and additional expenditures outside of San Bernardino County.

The resulting total indirect and induced effects of the Modified Project occurring within San Bernardino County during the first year of operation would be 2 additional indirect and 25 induced jobs generated by the local expenditures and payroll, and approximately $84,116 and $937,936 in indirect and induced income impacts, respectively. The indirect and induced output for dollars generated for other industries supplying the power generation industry was estimated to be $268,987 and $2,950,374, respectively. The dollar estimates are provided in 2011 dollars.

Therefore, the results of the IMPLAN Professional analysis for the Modified Project indicated that the Modified Project, like the Approved Project, would be expected to generate long-term beneficial impacts on the San Bernardino County economy.

4.10.2.2.3 Operations Impacts on Fiscal Resources

The Commission concluded that the payroll, local purchases, and sales tax revenues generated by the expenditures associated with the Approved Project would likely have long-term beneficial effects on the San Bernardino economy (Commission Decision, Section VII, C, page 3). Local purchases of materials, supplies, equipment, and services are expected to total approximately $600,000 per year once the Project is fully operational (expected in 2016). Based on the current San Bernardino County tax rate of 8.75%, the Modified Project would generate approximately $52,500 a year in sales tax. The Modified Project also would be expected to have long-term beneficial effects on the San Bernardino economy.

The Commission concluded that under existing state law, the Project is exempt from property taxes as a qualifying solar energy project (California Revenue and Taxation Code, Section 73; Commission Decision, Section VII, C, page 4). Components covered by this exemption would include storage devices, power conditioning equipment, transfer equipment, and parts related to the functioning of these items. The taxable value of the non-solar components analyzed for the Approved Project, which would include the proposed administrative offices, operation control room, and maintenance facilities, was estimated to be approximately $20 million (Commission Decision, Section VII, C, page 4). The value of components under the Modified Project would be assessed when the Project is constructed. Assuming a current San Bernardino County property tax rate for the Project area of approximately 1.04 percent, using approximately $20 million, the first operational year at full build out would generate approximately $208,000 annually in property taxes on non-solar Project components.[4] These estimates were developed

[4] The 2008 AFC and Commission Decision use a property tax rate of 1.1 percent (2008 AFC, page 5.10-30; Commission Decision, Section VII, C, page 4). However, a property tax rate of 1.04 percent is more reflective of the Project area currently.

to provide an indication of the property tax revenues that would be generated by the Project. The Modified Project would be expected to continue to have long-term beneficial effects on the San Bernardino economy.

Under the Modified Project, additional tax revenue would be generated based on the rent paid to the BLM, according to BLM Instruction Memorandum (IM 2010-141), Solar Energy Interim Rental Policy. These rental provisions associated with the BLM ROW consist of two components: a base rent to be paid upon issuance of the authorization of the Project, and a MW capacity fee that would be implemented over a five-year period once the facility began generating electricity. The BLM solar energy ROW rental fees would generate additional tax revenue for the San Bernardino economy.

The BLM would calculate and bill the Calico Solar a base rent. This base rent was calculated for San Bernardino County based on land values published by the National Agricultural Statistics Service to establish rental fees for linear ROW facilities on public lands. The base rent is a per-acre fee that would be charged, regardless of the stage of development or operation, on the entire public land acreage described in the ROW authorization. The per-acre fee for San Bernardino County is $125.56. The base rent for would be approximately $579,000 per year.[5] Using this formula for the duration of the BLM lease of 30 years, the base rent would generate approximately $17,370,000 ($579,000 x 30) for the BLM. San Bernardino County would assess a possessory use tax on the entire base rent of approximately $17,370, 000. Based on a San Bernardino County property tax rate for the Project area of approximately 1.04 percent, this use tax would total approximately $180,648 and would be assessed annually by the County. The total use tax assessed from the base rent of the 30-year lease is an estimate developed to provide an indication of possessory use tax revenues that are anticipated to be generated under the Modified Project. The BLM might adjust base rents each year and San Bernardino County tax rates would likely change. The approximate use tax generated by the Modified Project would be expected to continue to have significant long-term beneficial effects on the San Bernardino economy.

The BLM charges a MW capacity fee, in addition to the base rent, for each solar energy ROW application. The MW capacity fee captures the increased industrial use value of the authorization, above the limited rural/agricultural land value captured by the base rent. This capacity fee would be charged on an annual basis upon the start of generation of electricity from the facility. The BLM would provide for a five-year implementation of the MW capacity fee after the start of generation operations (at the rates of 20 percent the first year, 40 percent the second year, 60 percent the third year, 80 percent the fourth year, and 100 percent the fifth and subsequent years of operations). The MW capacity fee for PV is $5,256 per MW and $6,570 per MW for concentrated solar power (SunCatcher).

Using these rates, the total annual fee upon 100 percent, or the fifth and subsequent years of operations, would approximate $3 million for PV ($5,256 x 563 MW) and $660,000 for SunCatcher ($6,570 x 100.5) to total approximately $3,660,000 of annual MW capacity fee for the BLM. San Bernardino County would assess a possessory use tax fee by applying this annual estimate times 30 years (the BLM ROW period) to represent the entire approximate value of the BLM MW capacity fee. Based on a San Bernardino County property tax rate for the Project area of approximately 1.04 percent, this MW capacity

[5] The BLM approved a total 4,604 acres in the Record of Decision (ROD). The 4,604 acres approved in the ROD were used to factor the lease with the BLM.

fee would total approximately $1,113,000 in possessory use tax fees for the County. San Bernardino County would assess this entire value of $1,113,000 annually. This possessory use tax is approximate, as the BLM would periodically review the efficiency factors for the various solar technologies and update the MW capacity fee to reflect improvements in technology and San Bernardino County tax rates would likely change.

Under the Modified Project, property tax (approximately $208,000 annually) and possessory use taxes (approximately $180,648 and $1,113,000 annually) would represent approximately $1,501,648 taxes annually for San Bernardino County. Therefore, like the Approved Project, the Modified Project is expected to result in significant long-term beneficial effects on the region.

4.10.2.3 Environmental Justice

The Commission concluded that there would be no environmental justice impacts related to the Approved Project. As with the Approved Project, no minority population or low-income population within a six-mile radius of the Modified Project would exceed the 50 percent threshold established in environmental justice guidance. As with the Approved Project, the Modified Project would not create disproportionate impacts on minority and/or low-income populations (see also Section 4.2, Air Quality for a discussion of the Project change as it relates to environmental health and air quality impacts). The Modified Project would result in no environmental justice impacts.

4.10.3 Changes in Cumulative Environmental Impacts

The Commission Decision concluded that the Approved Project would not result in any significant cumulative impacts to socioeconomics. Incremental impacts of the Modified Project on socioeconomics are expected to be the same or slightly reduced compared to the Approved Project. As described in Section 4.23, Cumulative Scenario, no new reasonably foreseeable future actions beyond those assumed in the Commission Decision have been identified. Therefore, no increase in cumulative impacts under the Modified Project is anticipated.

4.10.4 Changes in LORS Conformance and Other Permits

In its Commission Decision, the Commission concluded that, with the implementation of the Conditions, the Approved Project would comply with all applicable LORS. As with the Approved Project, the Modified Project would comply with all applicable LORS, and no new or additional LORS have been identified.

4.10.5 Changes in Proposed Mitigation

No new or more severe impacts requiring additional mitigation would result from the Modified Project. The mitigation measures proposed in the Commission Decision would mitigate impacts associated with the Modified Project to levels that would be less than significant.

4.10.6 Changes in Conditions of Certification

The Commission concluded that the Approved Project would not require Conditions for socioeconomics and environmental justice. As no additional mitigation would be required, the Modified Project would not result in new Conditions.

4.10.7 References Cited

Bureau of Land Management (BLM). Instruction Memorandum No. 2010-141, Solar Energy Interim Rental Policy. June, 2010.

4.11 TRAFFIC AND TRANSPORTATION

The following sections discuss the Modified Project's impacts to traffic and transportation as compared to the Approved Project.

4.11.1 Summary of Project Changes Related to Traffic and Transportation

The Modified Project would reduce the traffic and transportation impacts identified for the Approved Project. The reduction of the SunCatcher technology and the addition of PV modules would reduce the peak construction and operation workforces, thereby reducing vehicle trip generation compared to the Approved Project. The technology change would also reduce the potential for glint and glare to affect rail transport traversing the Project site. The phasing change would reduce the need to use a temporary crossing to the north side of the railroad.

Figure 4.11-1, Project Access and Layout, illustrates the roadway circulation system serving the Project site. The figure shows some minor alignment modifications of the main access road under the Proposed Project as compared to the alignment for the Approved Project.

4.11.2 Changes in Environmental Impacts

Table 4.11-1 summarizes the Approved Project's Peak Project Construction Trip Generation, contained in the Calico Solar AFC, which was the basis for the traffic analysis provided in the Supplemental Staff Assessment and the Commission Decision on the Approved Project, and Table 4.11-2 summarizes the Modified Project's updated Peak Project Construction Trip Generation.

Table 4.11-1
Project Construction Trip Generation (Approved Project)

Vehicle Type	Peak Daily Trips	Morning Peak Trips			Evening Peak Trips		
		Inbound	Outbound	Total	Inbound	Outbound	Total
Construction worker vehicles[1]	1,462	731	0	731	0	731	731
Truck deliveries[2]	274	41	0	41	0	41	41
Total Trips	1736	771	0	771		771	771

Source: Calico Solar, LLC, 2008

Notes:

1 Peak workforce was analyzed at 731 worker trips, it was conservatively assumed each driver traveled alone during both the morning (0700 to 0900) and evening (1600 to 1800) peak hours.

2 Truck deliveries shown in the table were adjusted into PCE vehicles (3 PCE per truck). 1,099 truck trips per month = 3,297 PCEs divided by 24 working days = 137 PCE one-way trips or 274 round trips per day on average. It was also assumed that 30 percent of the truck delivery trips arrive during the morning peak hour and leave during the evening peak hour while the remaining deliveries (70 percent) would arrive and leave during off-peak hours.

PCE = passenger car equivalent

Table 4.11-2
Project Construction Trip Generation (Modified Project)

Vehicle Type	Peak Daily Trips	Morning Peak Trips			Evening Peak Trips		
		Inbound	Outbound	Total	Inbound	Outbound	Total
Construction worker vehicles[1]	714	357	0	357	0	357	357
Truck deliveries[2]	108	54	0	54	0	54	54
Total Trips	822	411	0	411		411	411

Source: Calico Solar, LLC, 2011, URS Corporation, 2011

Notes:

1 Peak workforce was analyzed at 357 (Month 13) worker trips, it was conservatively assumed each driver traveled alone during both the morning (0700 to 0900) and evening (1600 to 1800) peak hours.

2 Truck deliveries (Month 13) were adjusted into Passenger Car Equivalent (3 PCE) vehicles (18 Delivery vehicles x 3 PCE = 54 one-way or 108 round trips). Delivery trips were conservatively assumed to occur during both the morning inbound (0700 to 0900) and evening outbound (1600 to 1800) peak hours.

PCE = passenger car equivalent

A comparison of Table 4.11-1, Project Construction Trip Generation (Approved Project) and Table 4.11-2, Project Construction Trip Generation (Modified Project) shows that the updated Peak Project Construction Trip Generation under the Modified Project would be lower than the Peak Project Construction Trip Generation anticipated for the Approved Project.

Modified Project Operations Trip Generation

Table 4.11-3 summarizes, the Project Operation Trip Generation upon which the Supplemental Staff Assessment and Commission Decision on the Approved Project were based and Table 4.11-4 summarizes the updated Project Operations Trip Generation under the Modified Project.

Table 4.11-3
Project Operations Trip Generation (Approved Project)

Vehicle Type	Peak Daily Trips	Morning Peak Trips			Evening Peak Trips		
		Inbound	Outbound	Total	Inbound	Outbound	Total
Operations[1]	248	124	0	124	0	124	124
Deliveries[2]	36	9	6	15	0	6	6
Visitors	20	5	5	10	5	5	10
Total Trips	304	138	11	149	5	135	140

Source: Calico Solar, LLC 2008

Notes:

1 Peak workforce was analyzed at 124 worker trips, it was conservatively assumed each driver traveled alone during both the morning (0700 to 0900) and evening (1600 to 1800) peak hours. Note that this includes 120 workers (drive alone) plus 4 van pooling vehicles.

2 Heavy trucks shown in the table were adjusted into Passenger Car Equivalent (3 PCE) vehicles (6 Delivery vehicles x 3 PCE = 18 one-way or 36 round trips).

PCE = passenger car equivalent

Table 4.11-4
Project Operations Trip Generation (Modified Project)

Vehicle Type	Peak Daily Trips	Morning Peak Trips			Evening Peak Trips		
		Inbound	Outbound	Total	Inbound	Outbound	Total
Operations[1]	240	120	0	120	0	120	120
Van Pool	10	5		5		5	5
Deliveries[2]	24	6	4	10	0	4	4
Visitors	20	5	5	10	5	5	10
Total Trips	294	136	9	145	5	134	139

Source: Calico Solar LLC, 2011, URS Corporation, 2011

Notes:

1 Peak workforce was analyzed at 120 staff cars, it was conservatively assumed each driver traveled alone during both the morning (0700 to 0900) and evening (1600 to 1800) peak hours.

2 Heavy trucks shown in the table were adjusted into Passenger Car Equivalent (3 PCE) vehicles (4 Delivery vehicles x 3 PCE = 12 one-way or 24 round trips).

PCE = passenger car equivalent

A comparison of Table 4.11-3 Project Operations Trip Generation (Approved Project) and Table 4.11-4 Project Operations Trip Generation (Modified Project) shows that the updated Project Operation Trip Generation would be lower than the previous Project Operation Trip Generation anticipated for the Approved Project.

Based on the Project modifications described above, the Modified Project would result in traffic and transportation impacts equal to or less than those of the Approved Project. Each impact described in the Commission Decision, and the change in that impact that would result from the Modified Project, are described below.

- Project construction traffic impacts would decrease compared to the Approved Project, due to reduced trip generation.
- Project operations traffic impacts would decrease compared to the Approved Project, due to reduced trip generation.
- The modified Main Project Access Road within the Project site would not change the conclusions presented in the Commission Decision regarding traffic and transportation, including emergency services vehicle access.
- The partial technology change that would reduce the number and location of SunCatchers on the Project site would reduce transportation impacts related to potential glint and glare impacts on BNSF train operators.
- The proposed Modified Project phasing would reduce construction-phase traffic safety concerns, including emergency services vehicle access, due to the ability of Phase 2 construction personnel and equipment to use a permanent bridge, rather than a temporary crossing, to cross to the north of the BNSF railroad.
- All other Project changes not described above are anticipated to have no adverse effect on Traffic and Transportation compared to the impacts described in the Commission Decision.

Based on the information and conclusions provided above, no increase in environmental impacts associated with Traffic and Transportation are anticipated under the Modified Project.

4.11.3 Changes in Cumulative Environmental Impacts

The Commission Decision concluded that the Approved Project would not result in any significant cumulative impacts to traffic and transportation. Incremental impacts of the Modified Project on traffic and transportation are expected to be the same or slightly reduced compared to the Approved Project. As described in Section 4.23, Cumulative Scenario, no new reasonably foreseeable future actions beyond those assumed in the Commission Decision have been identified. Therefore, no increase in cumulative impacts under the Modified Project is anticipated.

4.11.4 Changes in LORS Conformance and Other Permits

In its Commission Decision, the Commission concluded that, with the implementation of the Conditions, the Approved Project would comply with all applicable LORS. As with the Approved Project, the Modified Project would comply with all applicable LORS, and no new or additional LORS have been identified.

4.11.5 Changes in Proposed Mitigation

No new or more severe impacts requiring additional mitigation would result from the Modified Project. The mitigation measures proposed in the Commission Decision would mitigate impacts associated with the Modified Project to levels that would be less than significant.

4.11.6 Changes in Conditions of Certification

The conforming changes to the Conditions for the Modified Project related to traffic and transportation are:

TRANS-1– Construction of All-Weather Roads and Bridge. ~~If an easement is granted and the Applicant begins construction, the Applicant~~The project owner shall construct the main services road using asphalt and all other roads using Soiltac or its equivalent according to California State Fire Marshall specifications as outlined in California Fire Code Section 902.2.1 et seq. These roads shall be constructed with appropriate materials so that they will be safe for use in crossing washes at the site.

In addition, the ~~Applicant~~Project owner shall coordinate its activities, relating to permanent crossing of the railroad, with the BNSF Railway. Those activities include working with the Public Utilities Commission to ensure compliance with provisions of the California Public Utilities Code Sections 1201- 1220.

During construction of ~~both~~ the ~~temporary and~~ permanent ~~road, temporary crossing of BNSF tracks, and permanent~~ crossing of BNSF tracks, the ~~Applicant~~Project owner shall prepare and coordinate with BNSF Railway; California Public Utilities Commission; and Federal Railroad Administration a safety plan for ensuring that all state and federal safety requirements for railroad crossings are followed.

That plan shall be reviewed and coordinated with BNSF Railway, appropriate regulatory agencies, and the CPM to ensure compliance with all state and federal requirements and approved by those agencies s well as the CPM.

Verification: At least 30-days prior to the start of ~~mobilization, right-of-way easements shall be obtained and presented to the CPM. In addition to the BSNF easement, the~~construction of permanent crossing, project owner shall provide ~~the~~to CPM a copy of

right-of-way easements for the permanent crossing from BNSF and all documents pertaining to approvals from the Federal Railroad Administration (FRA); and the California Public Utilities Commission (CPUC). A courtesy copy shall be provided to the California Department of Transportation (Caltrans), District 8 Office. Within 30 days after the completion of each ~~road and~~ railroad crossing ~~improvements~~improvement, the project owner shall provide the CPM with a copy of written approvals from BNSF, FRA, and CPUC as to the adequacy and safety of the roads and bridge.

TRANS-2 – Traffic Control Plan. ~~Prior to the start of construction for the Calico Solar Project, the~~The project owner shall prepare and implement a traffic control plan (TPC) for the project's construction and operation traffic. The plan shall address the movement of workers, vehicles, and materials, including arrival and departure schedules and designated workforce and delivery routes.

For the project's construction period, the plan is to be designed to take into account any impediments that may or could occur because of the need to cross BNSF Railway tracks. In developing this plan the ~~Applicant~~Project owner

is required to consider off-site parking and staging in designated areas and the use of buses to transport workers to and from the construction site.

Once the bridge is constructed, the ~~Applicant~~Project owner shall prepare a parking and staging plan to require all project-related parking to occur on-site or in designated off-site parking areas and that staging occurs on-site in a specifically-defined area. The project owner shall consult with the BNSF Railway; County of San Bernardino; and the California Department of Transportation (Caltrans) District 8 office in the preparation and implementation of the plan and shall submit the proposed traffic control plan to the BNSF Railway; County of San Bernardino; and Department of Transportation (Caltrans) District 8 office in sufficient time for review and comment. The plan, along with any written comments from the BNSF Railway, County of San Bernardino; and Department of Transportation (Caltrans) District 8 office, shall then be submitted to the Energy Commission Compliance Program Manager (CPM) for review and approval prior to the proposed start of construction and implementation of the plan.

The traffic control plan shall include:

A work schedule and end-of-shift departure plan designed to ensure that stacking does not occur on intersections necessary to enter and exit the project site. The project owner shall consider using one or more of the following measures designed to prevent stacking: (1) staggered work shifts; (2) off-peak work schedules; and (3) restricting travel to and departures from the project site to ten or fewer vehicles every three minutes during peak travel hours on Interstate 40.

Provisions for at least two flaggers stationed at the BNSF Railway crossing during each day of construction until the proposed bridge is constructed and operating. Flaggers shall be present at the BNSF Railway crossing to ensure the safe crossing of workers, visitors, and delivery persons arriving and leaving the project site.

Provisions for an incentive program such as an employer-sponsored Commuter Check Program to encourage construction workers to carpool or use van or bus service or both.

Provisions for delivering and staging of heavy equipment and building material deliveries as well as for the movement of hazardous materials to the site.

~~Limitation on~~Schedule truck deliveries to the project ~~sites~~site to ~~only~~maximize off-peak hours and to ensure adequate exit and entry at appropriate intersections and railroad tracks.

On I-40, provisions for direction and redirection of construction traffic with flag persons as necessary to ensure traffic safety and minimize interruptions to non-construction-related traffic flow.

Placement of signage, lighting, and traffic control devices at the project construction site and laydown areas.

Signage along eastbound and westbound appropriate roads and at the entrance of the Hector Road I-40 northbound and southbound off-ramps to notifying drivers of construction traffic throughout the duration of the construction period.

A heavy-haul plan designed to address the transport and delivery of heavy and oversized loads requiring permits from Department of Transportation (Caltrans) or other state and federal agencies.

Parking for workforce and construction vehicles, including consideration of off-site parking prior to opening of bridge across BNSF Railway tracks, to prevent stacking on I-40 roads and intersections and facilitate timely and safer crossing across tracks for workers, visitors, and delivery persons as well as for emergency access.

Verification: At least 30-days prior to the start of ~~construction, including any grading or site remediation on the power plant site or its associated easements~~Pre-Construction Site Mobilization, the project owner shall submit the proposed traffic control plan to BNSF Railway; San Bernardino County; and the Department of Transportation (Caltrans) District 8 office for review and comment and to the CPM for review and approval. The project owner shall also provide the CPM with a copy of the transmittal letter to BNSF Railway; San Bernardino County; and the Department of Transportation (Caltrans) District 8 office requesting review and comment.

At least 30 calendar days prior to the start of ~~construction~~Pre-Construction Site Mobilization, the project owner shall provide copies of any comment letters received from BNSF Railway; San Bernardino County; and the Department of Transportation

(Caltrans) District 8 office along with any changes to the proposed traffic control plan for CPM review and approval.

TRANS-3 – Limitations on Vehicle Size and Weight. ~~Due to the dynamic nature of the construction environment, at least 30 days prior to the start of construction, the~~

1. Road Crossing. The project owner shall consult with ~~the BNSF Railway,~~ San Bernardino County~~,~~ and the Caltrans District 8 office to coordinate procedures for obtaining required and necessary ~~easement~~easements and permits for road crossings, on an as-needed basis.

After consultation with ~~BNSF Railway,~~ San Bernardino County, and the Caltrans Office District 8 office, the project owner shall prepare a coordination plan designed to comply with limitations imposed by California Department of Transportation (Caltrans) District 8 office and other relevant jurisdictions including San Bernardino County on vehicle sizes and weights. In addition, the project owner or its contractor shall obtain necessary transportation permits from Caltrans and all relevant jurisdictions for use of roadways.

2. Railroad Crossings. The project owner shall consult with BNSF to coordinate procedures for obtaining required and necessary easements and permits for railroad crossings, on an as-needed basis.

Verification: At least 30 ~~calendar~~ days prior to construction~~, a copy of the coordination plan shall be provided to the CPM for review and comment. In addition, the~~ of a crossing, project owner shall provide to the CPM applicable copies of easements and permits obtained from BNSF Railway; San Bernardino County; ~~and~~or the Caltrans District 8 office to the CPM~~.~~ and a copy of any required coordination plan.

In the Monthly Compliance Reports (MCRs), the project owner shall submit copies of any easements or permits or both received during that reporting period. In addition, the project owner shall retain copies of these permits and supporting documentation in its compliance file for at least six months after the start of commercial operation. The project owner shall retain copies of BNSF ~~Railway~~ easements for the life of the project.

TRANS-4 – Encroachment into Public Rights of Way. The project owner and its contractor shall comply with Caltrans and other relevant jurisdictions limitations for encroachment into public rights-of-way and shall obtain necessary encroachment permits from Caltrans and all relevant jurisdictions.

Verification: In the monthly compliance reports (MCRs), the project owner shall submit copies of permits received during the reporting period. In addition, the project owner shall retain copies of these permits and supporting documentation in its compliance file for at least six months after the start of commercial operation.

TRANS 5 – Restoration of All Public Roads, Easements, and Rights-of-Way. The project owner shall restore all public roads, easements, and rightsof-way that have been damaged due to project-related construction activities to original or near-original condition in a timely manner, as directed by the CPM. Repairs and restoration of access roads may be required at any time during the construction phase of the project to assure safe ingress and egress.

Verification: At least 30 days prior to the start of ~~mobilization~~Pre-Construction Site Mobilization, the project owner shall photograph or videotape all affected public roads, easements, and right-of-way segments and/or intersections and shall provide the CPM, the affected local jurisdictions, and Caltrans (if applicable) with a copy of these images. The project owner shall rebuild, repair and maintain all public roads, easements, rights-of-way in a usable condition throughout the construction phase of the project.

In addition, the project owner shall consult with the County of San Bernardino and California Department of Transportation (Caltrans) District 8 and notify them of the proposed schedule for project construction. The purpose of this notification is to request that San Bernardino County and Caltrans consider postponement of public right-of-way repair or improvement activities in areas affected by project construction until construction is completed and to coordinate with the project owner regarding any concurrent construction-related activities that are planned or in progress and cannot be postponed. The purpose of this requirement is to help ensure cooperation from San Bernardino County and Caltrans so that the ~~Applicant~~Project owner's construction work is accommodated and the project can be completed in a timely and safe manner.

TRANS 6 – Permits/Licenses to Transport Hazardous Materials. The project owner shall ensure that permits and/or licenses are secured from the California Highway Patrol and Caltrans for the transport of hazardous materials.

Verification: The project owner shall include in its monthly compliance reports (MCRs), copies of all permits and licenses acquired by the project owner or contractors or both concerning the transport of hazardous substances.

TRANS-7 – ~~Prevention of Glare from SunCatchers to BNSF Train Crews and Motorists on Hector Road; Route 66; and Interstate 40~~Glint and Glare Study

~~This Condition of Certification is divided into two sections. Section One concerns the testing of signals to ensure that they are easily visible to train engineers. Section Two concerns general location, operating, and reporting procedures pertaining to the SunCatcher mirrors.~~

~~**I. Signal Light Modifications**~~

~~Immediately after the installation of the first SunCatcher mirrors near the BNSF Railway right-of-way but before operation of the mirrors, the Applicant will work with BNSF Railway to ensure that the operation of the SunCatcher mirrors will not interfere with the railroad engineers' ability to accurately see and respond to appropriate signal lights.~~

~~The Applicant will work with BNSF Railway to determine the appropriate size and design of shields to be affixed to signal lights as well as measures to increase the contrast of the signal light, including orienting the appropriately sized shield around the signal light and increasing the brightness of the signal light emitter over historic light levels using current LED signal technology.~~

~~In addition, the Applicant will work with BNSF Railway to determine emergency reporting procedures to immediately identify, report, and repair any malfunctioning or missing shield.~~

Project owner shall coordinate with BNSF to conduct, at project owner's expense, a glint and glare study to determine the impacts from glint and glare on (a) rail operations, including a train crew's ability to see accurately and respond to signals, (b) other modes of transportation on Hector Road, Route 66 and Interstate 40, and (c) the health of rail employees, agents or contractors, resulting from the placement of SunCatchers and/or the PV modules on the Project site.

Verification: ~~**Signal Light Modifications.** At least 45 days before the first SunCatchers are operated, the Applicant shall consult with BNSF to prepare a plan to design, develop, and manufacture the appropriate shields to ensure that railroad engineers can accurately identify and respond properly to signal lights. As part of the development process, the Applicant shall coordinate the development of the plan as well as the manufacture and installation of these shields with BNSF Railway, California Public Utilities Commission, and the CPM. The completed plan shall be submitted to the CPM for review and approval at least 30 days prior to the start of operations.~~Prior to Pre-Construction Site Mobilization, project owner shall provide the results of the glint and glare study to the CPM for review and approval.

~~At least 30 days before the first SunCatchers are operated, the Applicant shall consult with BNSF Railway to test the shielded signal lights to ensure that the railroad engineers can accurately identify and respond to the appropriate signal. The CPM shall also be notified when testing shall occur. Once BNSF Railway, California Public Utilities Commission has accepted the modified shield and verified that it allows the railroad engineers to accurately identify and respond to the proper signal, the Applicant, along with BNSF Railway, shall coordinate methods and reporting procedures to ensure their safe and effective use.~~

~~The Applicant shall develop, with BNSF Railway's input and approval, a monitoring plan that shall provide for the immediate reporting of any defective shield as well as its immediate replacement. This plan shall include methods for coordinating and implementing these reporting procedures with all necessary federal, state, and local agencies as well as BNSF Railway. This monitoring plan shall be submitted to the CPM for review and approval.~~

~~In addition, the project owner shall provide the CPM a monthly report that includes the date, time, location, response, and response time of any malfunction, public complaint, or video detection covered by the emergency glare response program; any determinations made by the project owner as to cause of the problem; and methods taken to resolve the problem. A copy of these reports shall be kept by the project owner for at least five years.~~

~~II. General Location, Operating, and Reporting Procedures~~

~~The project owner shall accomplish the following:~~

1. ~~Modify the offset tracking procedure to use a 25-degree offset instead of the proposed 10-degree offset.~~

2. ~~Ensure the morning stow position-to-offset position transitions occur at least 30 minutes before sunrise and end in the 25 percent offset tracking position.~~

3. ~~Ensure that the "Night Stow" should occur 30 minutes after sunset to avoid any intrusive light effects.~~

4. ~~Ensure that the minimum distance from any SunCatcher reflector assembly to the BNSF right-of-way (ROW) or any public roadway shall be a minimum of 223 feet to reduce the possibility of temporary flash blindness. In addition, during the normal tracking and offset tracking positions, the project operator shall adhere to the following procedures and specifications:~~

5. ~~Develop and implement an emergency glare response program that includes all of the following:~~

   a. ~~Monitoring plan that requires (1) the use of video surveillance trucks to identify and document intrusive light conditions, covering all hours of operation on a weekly basis for five years; and (2) monitoring of the status of individual SunCatchers during all hours of operation to immediately identify any malfunctioning units with the potential to create glare within the BNSF Railway right-of-way; or on I-40, Route 66, or Hector Road.~~

~~b. Procedures that allow motorists and train operators, including AMTRAK and BNSF, to report to the project owner, as well as to Caltrans, California Highway Patrol (CHP), and the County of San Bernardino. In the case of complaints from motorists, any problems with glint or glare resulting from the operation or malfunction of SunCatchers. The procedures developed by the Applicant for public reporting of glare problems shall be developed in consultation with BNSF Railway, California Department of Transportation (Caltrans) District 8 office, California Highway Patrol (CHP), and San Bernardino County. These procedures shall include a toll-free number for reporting problems as well as a process for written notification to the project owner and to California Department of Transportation (Caltrans, District 8) and San Bernardino County, in the case of complaints from motorists; or to AMTRAK or BNSF Railway, or both, in the case of complaints from train operators or passengers.~~

~~c. Procedures for the immediate (1) repositioning of any malfunctioning units to avoid potential glare within the BNSF Railway right-of-way or on I-40, Route 66, or Hector Road; investigation and resolution of complaints received from train operators or motorists or both.~~

~~d. Process for evaluating intrusive light conditions identified by the video surveillance and determining, in consultation with the CPM, what operational or other changes may be warranted to reduce or eliminate the identified intrusion.~~

~~e. Procedures for documenting instances when malfunctioning units with the potential to create glare are identified, or when train operators or motorists complain of glare, and the actions taken in response to those instances or complaints.~~

~~f. Period reports to the Project CPM detailing instances of SunCatcher malfunction, public complaints about glare, or video detected problems that are covered by the emergency glare response program.~~

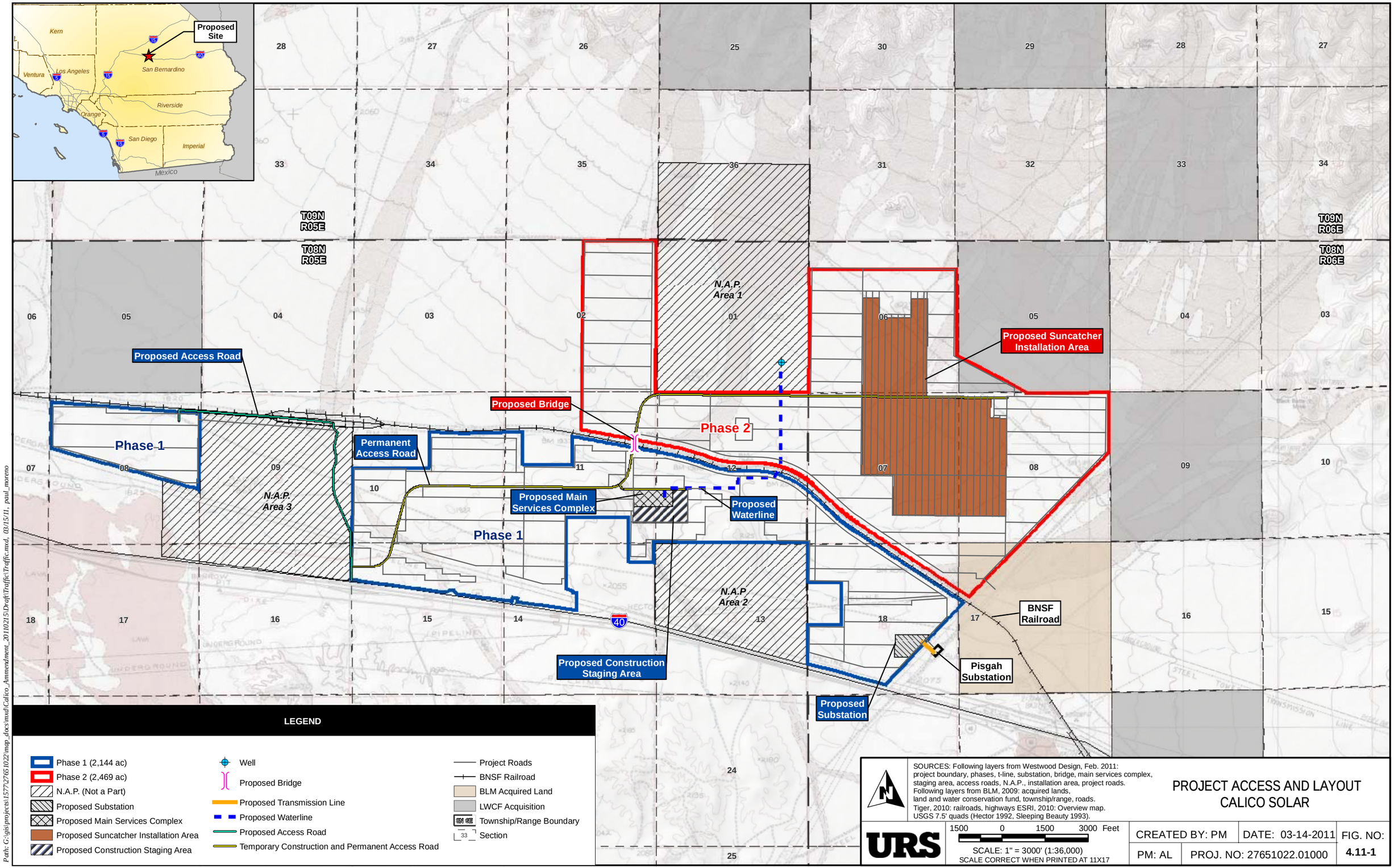
~~**Verification:** General Location, Operating, and Reporting. At least 30 days before the first SunCatchers are tested or operated, the project owner shall submit documentation to the CPM necessary to verify that the operational measures and setback requirements included in this Condition of Certification will be implemented and achieved.~~

~~At least 15 days before the SunCatchers are tested or operated, the project owner shall .submit to the CPM, for the CPM's review and approval, a copy of the project owner's draft emergency glare response program, including methods for coordinating and implementing the program with all state, county, and local agencies as well as BNFS Railway and AMTRAK.~~

~~Beginning no more than 30 days after the first SunCatchers are tested or operated and continuing for the duration of project operations, the project owner shall develop a procedure for any motorist, passenger, worker, train personnel, or visitor to report a malfunctioning unit and make those procedures known and available to those groups. The project owner shall provide the CPM a monthly report that includes the date, time, location, response, and response time of any malfunction, public complaint, or video detection covered by the emergency glare response program; any determinations made by the project owner as to cause of the problem; and methods taken to resolve the problem. A copy of these reports shall be kept by the project owner for at least five years.~~

4.11.7 References Cited

No references other than those presented in the Approved Project's record were used in the preparation of this analysis.


Proposed Site
Kern
Ventura
Los Angeles
San Bernardino
Riverside
Orange
San Diego
Imperial
Mexico
T09N R05E
T08N R05E
T09N R06E
T08N R06E
N.A.P. Area 1
N.A.P. Area 2
N.A.P. Area 3
Proposed Suncatcher Installation Area
Proposed Access Road
Proposed Bridge
Phase 2
Phase 1
Permanent Access Road
Proposed Main Services Complex
Proposed Waterline
Phase 1
N.A.P Area 2
BNSF Railroad
Pisgah Substation
Proposed Construction Staging Area
Proposed Substation
LEGEND
Phase 1 (2,144 ac)
Phase 2 (2,469 ac)
N.A.P. (Not a Part)
Proposed Substation
Proposed Main Services Complex
Proposed Suncatcher Installation Area
Proposed Construction Staging Area
Well
Proposed Bridge
Proposed Transmission Line
Proposed Waterline
Proposed Access Road
Temporary Construction and Permanent Access Road
Project Roads
BNSF Railroad
BLM Acquired Land
LWCF Acquisition
Township/Range Boundary
Section
SOURCES: Following layers from Westwood Design, Feb. 2011:
project boundary, phases, t-line, substation, bridge, main services complex,
staging area, access roads, N.A.P., installation area, project roads.
Following layers from BLM, 2009: acquired lands,
land and water conservation fund, township/range, roads.
Tiger, 2010: railroads, highways ESRI, 2010: Overview map.
USGS 7.5' quads (Hector 1992, Sleeping Beauty 1993).
PROJECT ACCESS AND LAYOUT
CALICO SOLAR
URS
1500 0 1500 3000 Feet
SCALE: 1" = 3000' (1:36,000)
SCALE CORRECT WHEN PRINTED AT 11X17
CREATED BY: PM
DATE: 03-14-2011
FIG. NO:
PM: AL
PROJ. NO: 27651022.01000
4.11-1
Path: G:\gis\projects\1577\27651022\map_docs\mxd\Calico_Ammendment_20110215\Draft\Traffic\Traffic.mxd, 03/15/11, paul_moreno

4.12 NOISE AND VIBRATION

As described in detail below impacts of the Modified Project to noise and vibration are expected to be less than or equal to those of the Approved Project and will remain less than significant.

4.12.1 Summary of Project Changes Related to Noise and Vibration

Under the Modified Project, changes to the Approved Project with respect to noise and vibration would include:

- reduction in the number of SunCatchers and addition of PV technology;
- relocation of main services complex;
- relocation of on-site substation;
- implementation of construction methods relating to PV Tracker Blocks;
- construction traffic activity;
- operation and maintenance vehicular traffic volumes; and
- reduction in length of main transmission line.

These changes have been studied with respect to potential alterations in the noise and vibration impact. Noise and vibration impacts from the Modified Project would be equal to or less than impacts associated with the Approved Project.

4.12.2 Changes in Environmental Impacts

The following sections describe environmental impact changes from the Modified Project compared to the Approved Project. Noise impacts relating to occupational noise are not included in this Amendment because there would be no change anticipated from the Commission Decision. While operation of the PV technology would create substantially less noise than operation of SunCatchers, employees of the Modified Project would be exposed to both. The length and frequency of exposure might be reduced however; employees would remain receptors of continuous exposure to occupational noise at levels approved in the Commission's Decision.

4.12.2.1 Construction Noise

The Commission Decision identified significant noise impacts from construction of the Approved Project at two sensitive receptors, SR1, which is approximately 1,200 feet from the nearest Project boundary, and SR2, which is approximately 7,800 feet from the nearest Project boundary (Commission Decision, Noise and Vibration p. 1). The Commission Decision identified construction noise levels of up to 74 decibel (dBA) *Leq*[6] at SR1 and 62 dBA *Leq* at SR2. The Commission Decision identified Conditions NOISE-1, NOISE-2 and NOISE-6 to mitigate construction noise impacts to these sensitive receptors (Commission

[6] *Leq* is a symbol that represents "Equivalent Continuous Noise Level".

Decision, Noise and Vibration pp. 2-3 9-13). Condition NOISE-6 also addresses the Approved Project's potential vibration impacts during construction.

The Commission Decision found a less-than-significant 1-dBA *Leq* noise increase from Approved Project operations at SR1 and a significant 11-dBA *Leq* noise increase from operations at SR2 (Commission Decision, Noise and Vibration p. 4). The Commission Decision imposed Condition NOISE-4 to mitigate this impact (Commission Decision, Noise and Vibration pp. 10-12).

As described in greater detail below, the Modified Project would reduce construction noise impacts to sensitive receptors because the Modified Project would require less noisy construction equipment than the Approved Project, primarily due to the replacement of most SunCatchers with PV Tracker Blocks. The Modified Project would also reduce operations noise impacts to sensitive receptors because PV Tracker Blocks are less noisy than SunCatchers.

Traffic noise was not discussed in the Commission Decision. The Modified Project would reduce traffic noise during construction because of its reduced need for heavy equipment and reduced number of construction workers commuting to the Project site. The Modified Project would reduce traffic noise during operation because it would reduce the operation workforce from approximately 180 to 112 workers.

4.12.2.1.1 SunCatcher Installation

Because the Modified Project would not alter the Project boundary, the distances from the boundary to SR1 and SR2 would not change from those reported in the Commission Decision (Figure 4.12-1).

In the Modified Project, all SunCatchers would be located within Phase 2 and geographically buffered from directly adjoining the boundary by areas of PV Tracker Block installation. Table 4.12-1 presents a comparison of distances between noise sensitive receivers and the nearest SunCatcher for the Approved Project and the Modified Project.

Table 4.12-1
Distance to the Nearest SunCatcher

Noise Sensitive Receiver	Approved Project	Modified Project
SR1	3,300 feet	22,500 feet
SR2	8,130 feet	9,700 feet

Sources: Calico Solar, LLC, 2011

Construction equipment anticipated for each 18 MW "block" of SunCatcher installation is presented in the Approved Project's record and is expected to remain unchanged. Due to the increase in distance between SunCatchers and noise sensitive receivers SR1 and SR2, a decrease in predicted SunCatcher installation noise is anticipated from the Modified Project.

4.12.2.1.2 PV Technology Installation

During construction, PV installation would occur near the Modified Project boundary. For purposes of this noise assessment, PV technology installation per crew is expected to proceed at the site at a rate of roughly 4 MW (approximately equivalent to 20 Acres) per month. Table 4.12-2 presents the list of construction equipment anticipated for a single PV technology installation crew.

Table 4.12-2
PV Technology Installation Construction Equipment

Construction Equipment[1]	Horse Power[1]	Sound Pressure Level at 1 meter (dBA)[2]	Number of Equipment[1]
Hydraulic Vibrating Post Driver	175	112	1
Flatbed Truck	250	114	2
Stickboom Crane	175	112	2
Trencher	50	107	1
Compactor	120	111	1
Large Backhoe with Mower Attachment	120	111	1
Skid-steer loader (Bobcat)	50	107	1
Backhoe	120	111	1
Front End Loader	250	114	2
Dump Truck	250	114	1
Water Truck	450	116	1

Source: Calico Solar LLC, 2011
Acronym:
dBA = decibel
Notes:
[1]Calico Solar, LLC, 2011.
[2]Beranek 1992, Section 18.5.

Based on the information provided in Table 4.12-2, Table 4.12-3 compares predicted construction noise levels included in the Commission Decision (Noise Table 3) with those anticipated from PV technology installation. As a worst-case scenario, it is assumed that up to three crews would be operating (during normally allowable daytime construction hours) adjacent to each other along a Modified Project boundary location that is closest to a noise-sensitive receiver. Two additional crews may be active as well, but the assumption is that they would be located at other site areas and at least a mile distant from the aforesaid maximum of three adjacent crews.

Table 4.12-3
PV Installation Construction Noise Levels

Noise Sensitive Receiver	Highest Construction Noise Levels in Commission Decision	PV Installation Noise Levels
SR1	74 dBA Leq	67 dBA Leq
SR2	62 dBA Leq	61 dBA Leq

Sources: Commission Decision 2010 (Noise Table 3), URS Corporation 2011
Acronyms/Abbreviations:
dBA – decibel
Leq - symbol that represents "Equivalent Continuous Noise Level".
PV - photovoltaic
Note:
PV Installation noise calculation is included in Appendix F. PV Installation Noise Levels are based on three adjacent crews operating simultaneously.

As presented in Table 4.12-3, installation of PV technology nearest to a noise sensitive receiver (SR1 or SR2) is expected to cause levels of construction noise lower than those presented in the Commission Decision for a "block" of SunCatchers at the same location.

The Modified Project may require nighttime PV technology installation activity. If this occurs, Condition NOISE-6 in the Commission Decision would apply at some locations. NOISE-6 allows for nighttime construction only after one of the three following requirements has been met: consent from owners of SR 1 and SR2, determination by the CPM that noise would not exceed the nighttime ambient noise levels at SR1 and SR2 by more than 5 dBA, or construction expected to increase nighttime ambient levels at SR1 and SR2 by more than 5 dBA that does not continue longer than 5 consecutive nights. At SR1, if one crew of equipment (and associated personnel), as shown in Table 4.12-2, operates at the nearest Project boundary, the noise level at SR1 would be 62 dBA, which is less than the nighttime ambient noise level (63 dBA) indicated in Noise Table 1 in the Commission Decision. Therefore, no significant noise impact is expected at SR1 for nighttime PV installation. Prior to conducting nighttime construction at a boundary location nearest to SR2, the Modified Project would comply with Condition NOISE-6 because the nighttime ambient noise level is significantly lower (38 dBA) than that of SR1.

4.12.2.1.3 Other Construction

"Other construction" includes construction activities for the Modified Project (e.g., assembly of SunCatcher units and PV Tracker Block elements, roadway construction, substation construction, etc.) apart from the previously discussed localized installation of SunCatchers and PV technology, with an assumed geographic acoustical center located at the main services complex, throughout the course of the construction schedule for the Modified Project. Under the Modified Project, the main services complex would be relocated to the Phase 1 area, south of the railroad. Table 4.12-4 provides a comparison of distances from SR1/SR2 to the main services complex for the two cases under consideration.

Table 4.12-4
Distance Comparison from MSC to Noise Sensitive Receivers

Noise Sensitive Receiver	Approved Project	Modified Project
SR1	22,600 feet	15,500 feet
SR2	16,700 feet	20,700 feet

Sources: Calico Solar, LLC, 2011

The roster of construction equipment for Approved Project has also been updated to reflect the requirements of the Modified Project; the updated roster is provided in Appendix F. Although the main services complex is expected to be closer to SR1 than before, due to this updated construction equipment roster, the expected noise level range associated with "other construction" is not expected to be greater than that analyzed in the Commission Decision. Table 4.12-5 provides this comparison.

Table 4.12-5
Other Construction Noise Levels

Noise Sensitive Receiver	Approved Project	Modified Project
SR1	48-55 dBA	49-52 dBA
SR2	51-58 dBA	47-50 dBA

Source: Calico Solar, LLC, 2011
Acronym:
dBA = decibel

4.12.2.1.4 Construction Traffic

Modified Project construction traffic includes worker trips and delivery trucks. Table 4.12-6 compares construction traffic trip generation between the Approved Project and the Modified Project.

Table 4.12-6
Project Construction Peak Daily Round Trips

Vehicle Type	Approved Project	Modified Project
Workers	1462	714
Delivery Trucks	46	18

Source: Calico Solar, LLC, 2011

Due to the decrease in traffic volume from that presented in the Approved Project, and because planned construction traffic routes have not significantly changed, predicted Construction Traffic noise is not expected to increase under the Modified Project.

4.12.2.2 Operational Noise

The following sections provide an overview of noise that would be generated during operation of the Modified Project by the SunCatchers and PV Tracker Blocks, by traffic, and by power transmission lines.

4.12.2.2.1 SunCatchers and PV Tracker Blocks

Modified Project operational noise levels at SR1 and SR2 are expected to change from the Approved Project. Noise sources assessed for the Approved Project were SunCatchers and transformers at the on-site substation. The Modified Project would replace the majority of SunCatchers with PV tracker blocks and the on-site substation would be relocated south of the railroad, to the eastern side of the Phase 1 boundary. The anticipated primary noise sources associated with the PV technology are inverter pads and the single-axis tracking system motors. Approximately 282 inverter pads would be built throughout the Modified Project site. Each inverter pad consists of one 2,500 kVA transformer and four 500 kW inverters. Table 4.12-7 presents sound power levels associated with all operation noise sources included in the model, which are considered to operate only during daytime hours.

Table 4.12-7
Noise Model Sound Level Parameters

Project Component	Type of Source	Sound Power Level (PWL) at Octave Band Center Frequency (Hz)									Overall Unweighted PWL (linear)	Overall A-Weighted PWL	Acoustic Height (feet)
		31.5	63	125	250	500	1,000	2,000	4,000	8,000			
SunCatcher[1,2]	Area	119	111	101	93	97	95	90	88	81	120	99	42.5
167 MVA Transformer at Substation[2]	Point	79	85	87	82	82	76	71	66	59	91	82	23
2500 kVA Transformer at an Inverter Station	Area	72	78	80	75	75	69	64	59	52	84	75	9
500 kW Inverter[3]	Area	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	71	9
3 HP Tracker Motor[4]	Area	68	69	70	70	70	80	70	60	50	82	81	5

Notes:
Sound levels presented in this table are for an individual unit or component. Aggregate sound levels for the area sources in the model were calculated based on the quantity of each component within the identified area.
[1]SunCatcher assembly includes measured composite levels from the Stirling Engine, electric generator, cooling fan, and air compressor.
[2]2008 AFC Table 5.12-6.
[3]Noise level indicated for 500kW Inverter is Sound Pressure Level at 1 meter.
[4]One tracker motor per 250kW of PVs. A total of 2252 tracker motors (i.e., equal to 563MW divided by 250kW) are included in the model.

Hz = hertz
HP = horse power
kVA = kilovolt ampere
MVA = megavolt ampere
PWL = power level
n/a = not available

The methodology described in the Approved Project's record was utilized to assess operational noise impacts. Table 4.12-8 compares predicted operational noise levels from the Commission Decision with those expected from the Modified Project.

Table 4.12-8
Predicted Operational Noise Levels

Noise Sensitive Receiver	Closest Distance to Noise Sensitive Receivers[1]	Daytime Ambient Noise Levels[2]	Operational Noise Levels in Commission Decision[2]	Operational Noise Levels Modified Project
SR1	4,200 feet	65 dBA Leq	57 dBA Leq	<45 dBA Leq
SR2	7,800 feet	41 dBA Leq	52 dBA Leq	48 dBA Leq

Sources: Commission Decision 2010. URS Corporation 2011.
Notes:
[1]Section 4.12.2.1 in this report.
[2]Commission Decision Noise Table 2.

While SR2 is located farther away from the Modified Project boundary than SR1, the noise level at SR2 is predicted to be higher than that at SR1 because the loudest operational noise sources are the SunCatchers, which are closer to SR2, as indicated in Table 4.12-1. As presented in Table 4.12-8, predicted Modified Project operation noise levels at SR1 and SR2 would be less than predicted noise levels reported in the Commission Decision. In addition, the newly predicted operation noise levels due to the Project modifications are not anticipated to cause an increase of more than 10 dBA over the current ambient noise level at SR1 and SR2. Therefore, no operation noise impacts are anticipated for the Modified Project.

4.12.2.2.2 Traffic Noise

Project operation-related traffic includes employee trips, delivery trucks, and visitors. Table 4.12-9 compares the Approved Project and Modified Project operations trip generation.

Table 4.12-9
Project Operations Peak Daily Round Trips

Vehicle Type	Approved Project	Modified Project
Employees	256	250
Deliveries	36	24
Visitors	20	20

Sources: Calico Solar, LLC, 2011
Note: Delivery trucks in the table were adjusted into Passenger Car Equivalent (3 PCE) vehicles, consistent with "Medium Truck" at 45 miles per hour (California Department of Transportation, TeNS, 1998, Table N-3340.2).

Modified Project van pool vehicle trips would increase by two, when compared to the Approved Project. However, delivery trucks would decrease by 12 Passenger Car Equivalent vehicles. Since a van pool

vehicle is considered a regular automobile and is quieter than a delivery truck, the predicted noise level is expected to decrease under the Modified Project when compared to the Approved Project. Therefore, no increase in predicted off-site operations traffic noise due to the Modified Project is anticipated because all categories of vehicle trips would be either unchanged or reduced.

4.12.2.3 Power Transmission Line

The Modified Project relocates the on-site substation to the eastern end of Phase 1, across from the existing Pisgah Substation. Due to the relocation, the length of the main transmission line is reduced within the Modified Project boundary. However, the main transmission line between the Modified Project boundary and Pisgah Substation would remain the same as in the Approved Project. Therefore, no increase in power transmission line noise from the Approved Project to the Modified Project is anticipated.

4.12.3 Changes in Cumulative Environmental Impacts

In the Commission Decision, the Commission concluded that the Approved Project would not have a cumulatively considerable effect on noise impacts in the vicinity of the site. As described in Section 4.23, Cumulative Scenario, no new reasonably foreseeable future actions beyond those presented in the Commission Decision have been identified. Incremental impacts on noise from the Modified Project are expected to be reduced and therefore, no increase in cumulative impacts from the Modified Project is anticipated.

4.12.4 Changes in LORS Conformance and Other Permits

The Commission Decision concluded that the Approved Project was consistent with all applicable LORS. Additional LORS beyond those identified in the Commission Decision have not been identified. Therefore, the Modified Project would conform to all applicable LORS.

4.12.5 Changes in Proposed Mitigation

Since no increase in predicted noise or noise impact is expected to occur under the Modified Project, no mitigation measures beyond those that may already appear in the Conditions are expected.

4.12.6 Changes in Conditions of Certification

The conforming changes to the Conditions for the Modified Project related to noise and vibration are:

NOTIFICATION OF NOISE COMPLAINT PROCESS

NOISE-1 ~~At least 15 days prior to the start of ground disturbance, the~~The project owner shall notify all residents within two miles of the site, by mail or other effective means, of the commencement of project construction. At the same time, the project owner shall establish a telephone number for use by the public to report any undesirable noise conditions associated with the

construction and operation of the project and include that telephone number in the above notice. If the telephone is not staffed 24 hours per day, the project owner shall include an automatic answering feature, with date and time stamp recording, to answer calls when the phone is unattended. This telephone number shall be posted at the project site during construction in a manner visible to passersby. This telephone number shall be maintained until the project has been operational for at least one year.

Verification: ~~Prior to ground disturbance~~At least 15 days prior to the start of Pre-Construction Site Mobilization, the project owner shall transmit to the Compliance Project Manager (CPM) a statement, signed by the project owner's project manager, stating that the above notification has been performed and describing the method of that notification, verifying that the telephone number has been established and posted at the site, and giving that telephone number.

NOISE COMPLAINT PROCESS

NOISE-2 Throughout the construction and operation of the project, the project owner shall document, investigate, evaluate, and attempt to resolve all project-related noise complaints. The project owner or authorized agent shall:

Use the Noise Complaint Resolution Form (below), or a functionally equivalent procedure acceptable to the CPM, to document and respond to each noise complaint;

Attempt to contact the person(s) making the noise complaint within 24 hours;

Conduct an investigation to determine the source of noise related to the complaint;

Take all feasible measures to reduce the noise at its source if the noise is project related; and

Submit a report documenting the complaint and the actions taken. The report shall include: a complaint summary, including final results of noise reduction efforts, and if obtainable, a signed statement by the complainant stating that the noise problem is resolved to the complainant's satisfaction.

Verification: Within five days of receiving a noise complaint, the project owner shall file a copy of the Noise Complaint Resolution Form with the CPM, documenting the resolution of the complaint. If mitigation is required to resolve a complaint, and the complaint is not resolved within a three-day period, the project owner shall submit an updated Noise Complaint Resolution Form when the mitigation is implemented.

NOISE CONTROL PROGRAM

NOISE-3 The project owner shall submit to the CPM for review and approval a noise control program and a statement, signed by the project owner's project manager, verifying that the noise control program will be implemented throughout construction of the project. The noise control program shall be used to reduce employee exposure to high noise levels during construction and also to comply with applicable OSHA and Cal/OSHA standards.

Verification: At least 30 days prior to the start of ~~ground disturbance~~Pre-Construction Site Mobilization, the project owner shall submit to the CPM the noise control program and the project owner's project manager's signed statement. The project owner shall make the program available to Cal/OSHA upon request.

NOISE RESTRICTIONS

NOISE-4 The project design and implementation shall include appropriate noise mitigation measures adequate to ensure that the operation of the project will not cause the noise levels due to plant operation alone to exceed an average of 51 dBA $_{Leq}$ measured at or near monitoring location SR2, and an average of 57 dBA $_{Leq}$ measured at or near monitoring location SR1.

No new pure-tone components shall be caused by the project. "Pure-tone" shall be understood to mean, for purposes of this Condition, a prominent one-third octave band with prominence evaluated between adjacent one-third octave band project operation sound levels and using frequency-dependent prominence ratio criteria values similar to those as defined by ANSI S1.13-2005 A.8.6. No single piece of equipment shall be allowed to stand out as a source of noise that draws legitimate complaints.

When the project first achieves a sustained output of 85 percent or greater of rated capacity, the project owner shall conduct a 25-hour community noise survey at monitoring location SR2, or at a closer location acceptable to the CPM. This survey shall also include measurement of one-third octave band sound pressure levels to ensure that no new pure-tone noise components have been caused by the project.

During the period of this survey, the project owner shall also conduct a short-term survey of noise at monitoring location SL1 or at a closer location acceptable to the CPM. The short-term noise measurements at this location shall be conducted during morning, early afternoon, and evening hours.

The measurement of power plant noise for the purposes of demonstrating compliance with this Condition of Certification may alternatively be made at a location, acceptable to the CPM, closer to the plant (e.g., 400 feet from the plant boundary) and this measured level then mathematically extrapolated to determine the plant noise contribution at the affected

residence. The character of the plant noise shall be evaluated at the affected receptor locations to determine the presence of pure tones or other dominant sources of plant noise.

If the results from the noise survey indicate that the power plant noise at the affected receptor sites exceeds the above specified values, mitigation measures shall be implemented to reduce noise to a level of compliance with these limits.

E. If the results from the noise survey indicate that pure tones are present, mitigation measures shall be implemented to eliminate the pure tones.

Verification: The survey shall take place within 30 days of the SunCatcher portion of the project first achieving a sustained output of 85 percent or greater of rated capacity. Within 15 days after completing the survey, the project owner shall submit a summary report of the survey to the CPM. Included in the survey report will be a description of any additional mitigation measures necessary to achieve compliance with the above listed noise limit, and a schedule, subject to CPM approval, for implementing these measures. When these measures are in place, the project owner shall repeat the noise survey.

Within 15 days of completion of the new survey, the project owner shall submit to the CPM a summary report of the new noise survey, performed as described above and showing compliance with this Condition.

OCCUPATIONAL NOISE SURVEY

NOISE-5 Following the project's first achieving a sustained output of 80 percent or greater of rated capacity of the SunCatcher portion of electrical production, the project owner shall conduct an occupational noise survey to identify the noise hazardous areas in the facility.

The survey shall be conducted by a qualified person in accordance with the provisions of Title 8, California Code of Regulations sections 5095–5099 and Title 29, Code of Federal Regulations section 1910.95. The survey results shall be used to determine the magnitude of employee noise exposure.

The project owner shall prepare a report of the survey results and, if necessary, identify proposed mitigation measures that will be employed to comply with the applicable California and federal regulations.

Verification: Within 30 days after completing the survey, the project owner shall submit the noise survey report to the CPM. The project owner shall make the report available to OSHA and Cal/OSHA upon request.

CONSTRUCTION TIME RESTRICTIONS

NOISE-6 Heavy equipment operation, including pile driving, and noisy construction[1] work relating to any project features shall be restricted to the times of day delineated below, unless:

- the project owner obtains the consent of the homeowners at SR1 and SR2; or
- the CPM determines that the noise will not exceed the daytime ambient noise levels at SR1 and SR2 (as shown in **Noise Table 5)** by more than 10 dBA and the nighttime ambient noise levels at SR1 and SR2 (as shown in **Noise Table 5)** by more than 5 dBA; or
- construction that is expected to increase those daytime ambient noise levels at those locations by more than 10 dBA continues no longer than four consecutive weekends or construction that is expected to increase nighttime ambient noise levels at those locations by more than 5 dBA continues no longer than five consecutive nights.

Mondays through Saturdays:	7:00 a.m. to 7:00 p.m.
Sundays and Holidays:	No Construction Allowed

Haul trucks and other engine-powered equipment shall be equipped with mufflers that meet all applicable regulations. Haul trucks shall be operated in accordance with posted speed limits. Truck engine exhaust brake use shall be limited to emergencies.

Verification: Prior to ~~ground disturbance~~start of Pre-Construction Site Mobiilzation, the project owner shall transmit to the CPM a statement acknowledging that the above restrictions will be observed throughout the construction of the project.
At least 20 days prior to the start of construction activities to occur outside the above required schedule restrictions, the project owner shall submit to the CPM a letter showing the affected homeowner's consent. If the consent cannot be obtained, at least 15 days prior to the start of those activities, the project owner shall submit to the CPM documentation showing the expected construction noise levels at SR1 and SR2, the nature of the work, the time of day/night that work will occur, and the duration of the work.

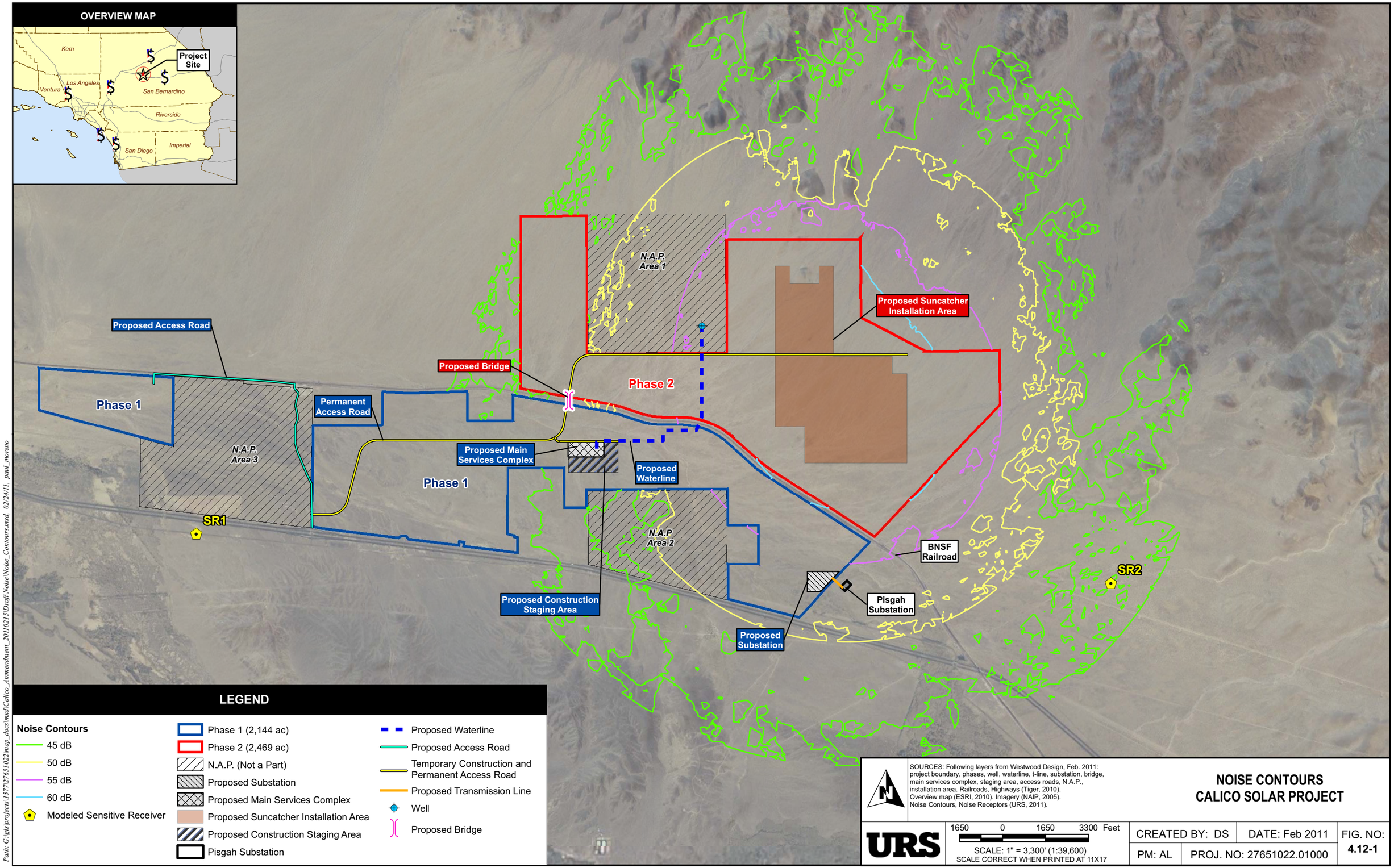
[1] Noisy Construction: "Noise that can potentially draw legitimate complaints." Legitimate Complaint: "A legitimate noise complaint refers to a complaint about noise that is confirmed by the CPM to be disturbing, and that is caused by the Calico project as opposed to another source. A legitimate complaint constitutes a violation by the project of any noise condition of certification (as confirmed by the CPM), which is documented by an individual or entity affected by such noise."

4.12.7 References Cited

California Department of Transportation. Technical Noise Supplement. 1998.

Beranek, L.L. and I.L. Ver, eds. Noise and Vibration Control Engineering. John Wiley & Sons, Inc. New York, NY. 1992.

Edison Electric Institute (EEI). Electric Power Plant Environmental Noise Guide, 2nd Edition, Revised. 1983.



SOURCES: Following layers from Westwood Design, Feb. 2011: project boundary, phases, well, waterline, t-line, substation, bridge, main services complex, staging area, access roads, N.A.P., installation area. Railroads, Highways (Tiger, 2010). Overview map (ESRI, 2010). Imagery (NAIP, 2005). Noise Contours, Noise Receptors (URS, 2011).

NOISE CONTOURS
CALICO SOLAR PROJECT

URS

1650 0 1650 3300 Feet

SCALE: 1" = 3,300' (1:39,600)
SCALE CORRECT WHEN PRINTED AT 11X17

CREATED BY: DS	DATE: Feb 2011	FIG. NO:
PM: AL	PROJ. NO: 27651022.01000	4.12-1

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4.13 VISUAL RESOURCES

As described in detail below impacts of the Modified Project to visual resources are expected to be less than or equal to those of the Approved Project.

4.13.1 Summary of Project Changes Related to Visual Resources

Under the Modified Project, changes to the Approved Project with respect to visual resource impacts would include:

- reduction in the number of SunCatchers;
- addition of PV modules;
- relocation of the main services complex and on-site substation; and
- reduction of transmission towers.

These changes are shown on Figure 4.13-1.

Table 4.13-1
Visual Resources
Significant Project Structures

Description	Permitted Qty	Modified Qty	Length (feet)	Width (feet)	Height (feet)	Change
SunCatcher power generating system	26,540	4,020	38 diameter		40	Quantity Reduced
PV Tracker Blocks	--	2,140	280		170	9
2 MW inverter pads	--	282	33.5		15	9
Modules	--	1,951,680	6.4		3.3	0.17
Main Services Complex administration building	1	1	60	70	17	Relocated
Main Services Complex maintenance building	1	1	70	70	17	Relocated
SunCatcher assembly building (temporary)	2	2	1,000	100	78	Relocated
On-site substation (excluding dead-end structure)	1	1	15.5 acres		5 to 30	Relocated
230 kV dead-end structure	1	1	--	100	90	Specified
Well water storage tank and fire water 230,000 gallons	1	1	40 diameter		25[1]	None
Demineralized water tank, 17,500 gallons[1]	2	2	18 diameter		10	None
Potable Water Tank, 5,000 gallons	1	1	10 diameter[1]		10[1]	None
230 kV transmission line towers, double circuit with upswept arms	12 to 15	0 to 3	--	32	90 to 110	Quantity Reduced

Notes:

1: The Commission Decision reflected discrepancies in these numbers. These numbers have been correct here for consistency.

A = ampere (amp), BIL = basic impulse level, gpd = gallon per day, HP = horsepower, Hz = hertz, INT = international, kA = kilo amps, kV = kilovolt, kVA = kilovolt amps, Kvar = kilo amp reactive, kW = kilowatt, kWe = kilowatt-electric, MVA = megavolt amps, MVAR = megavolt amp reactive, MW = megawatts, V = volts, VAR = volt amp reactive, W = watts

4.13.2 Changes in Environmental Impacts

The Commission Decision concluded that visual impacts under the Approved Project would be significant over an area of almost 10 square miles; views from I-40 and Route 66 would be significantly impacted by the Approved Project. Additionally, the Commission concluded that views from the Wilderness Study Area (WSA) north of the Project and from a nearby residence may be adversely impacted, although at levels that would be less than significant. The Commission also determined that, while mitigation would reduce impacts, the Approved Project would significantly impact visual resources.

The Modified Project would reduce the size and dominance of the Project features, compared to the Approved Project. Because the Project footprint would remain unchanged the scale of the Modified Project would be substantially similar to the Approved Project. The visual character of the area would continue to be significantly impacted by the Modified Project and, thus, significant impacts would remain. Specific changes in Project impacts are detailed below. Visual impacts were assessed based on the degree of change coupled with viewer response (viewer response is evaluated based on viewer exposure and sensitivity). Viewer response is assumed to remain unchanged, under the Modified Project, from the analysis presented in the Approved Project. Therefore, the analysis below focuses on the modifications to the degree of change under the Modified Project.

4.13.2.1 Visual Sphere of Influence

The Approved Project's Visual Sphere of Influence represents the area within which the Project could be seen and potentially would result in significant effects to visual resources (Figure 4.13-1, Sensitive Visual Resources Visual Sphere of Influence Map). A viewshed model was run using the heights and location of significant project structures to demonstrate the areas that are expected to have views of the Approved Project. The results of the viewshed model are shown as the shaded areas in Figure 4.13-1, which also includes the Key Observation Points (KOPs). This model represents a conservative analysis because it was based on the 8,230-acre proposed Project footprint and features.

4.13.2.2 Key Observation Points

KOPs are viewing locations chosen to be representative of the view from the most visually sensitive areas of the Modified Project (see Figures 4.13-3 through 4.13-26). In the Commission Decision, the inventory of KOPs included three components: (1) identification and photo-documentation of viewing areas and potential KOPs; (2) classification of visual sensitivity of KOPs; and (3) description of the visibility of Modified Project from the KOPs. KOPs were identified based on a review of available land use data, field inspection, and discussion with Commission staff responsible for the evaluation of visual resources. In order to evaluate the change in the Modified Project's appearance, simulations were developed to depict the expected appearance. Figures 4.13-3 – 4.13-26 show the existing view, permitted view, modified view, and a layout demonstrating each KOP location, topography, and Project feature setback from the KOP location, for each of the KOPs. An analysis of the changes in visual resource impacts resulting from the Modified Project, for each KOP, is presented below. For each KOP there is a corresponding figure showing a closeup view of the KOP location, elevation contour lines, and the distance from the KOP to the nearest Project feature in view.

4.13.2.2.1 KOP 1: Eastbound View from Route 66

KOP 1 is typical of the visual environment where the Project site can be seen along U.S. Route 66 (Figure 4.13-6). Figures 4.13-3 through 4.13-5 show existing, permitted, and modified views, respectively, from KOP 1. The Commission Decision identified a strong, adverse, unmitigable, and significant impact from KOP 1. The Modified Project would be significantly less visually prominent than the Approved Project due to the partial substitution of PV modules for SunCatchers. The partial substitution of technology would also reduce the Modified Project's obstruction of views of the Cady Mountains. While impacts to visual resources would be reduced at KOP 1 as a result of the Modified Project, the impacts would continue to be adverse, unmitigable, and significant.

4.13.2.2.2 KOP 2: View from Cady Mountain WSA

KOP 2 is typical of the visual environment where the Project site can be seen from within the Cady Mountain WSA (Figure 4.13-10). Figures 4.13-7 through 4.13-9 show the existing, permitted, and modified views, respectively, from KOP 2. The Commission Decision concluded that visual change within the WSA would range from moderate to strong under the Approved Project, depending on the location and distance across the WSA. However, because the majority of the WSA would experience a less significant degree of change due to the distance from the Project, overall impacts to viewers in the WSA would be less than significant. As is shown in the Modified Project view simulations, the Modified Project would result in a reduction in visual change as compared to the Approved Project, and impacts to viewers from the WSA would remain less than significant. The SunCatcher assembly buildings are the dominant Project feature from the Cady Mountains WSA under the Modified Project. Assembly buildings would not be built until Phase 2, would be temporary, and would be decommissioned once construction of the SunCatcher area was completed.

4.13.2.2.3 KOP 3: Closest Residential View Looking West

KOP 3 is typical of the visual environment where the Project site can be seen, in terms of middle and background views, from southeast of the Project boundary (Figure 4.13-14). Figures 4.13-11 through 4.13-13 show existing, permitted, and modified views, respectively, from KOP 3. The Commission Decision concluded that due to the low visual magnitude and very low viewer numbers, the moderately high level of anticipated visual change associated with the Approved Project would be considered adverse but less than significant. The Modified Project would result in a much reduced degree of change from KOP 3 than that of the Approved Project, primarily due to the reduction in length of the off-site transmission line, reduction or potential elimination of transmission structures, and reduced height of the PV modules. Visual impacts to KOP 3 from the Modified Project would remain at levels less than significant.

4.13.2.2.4 KOP 4: Long-Distance Traveler View from Westbound I-40

KOP 4 is typical of the visual environment, where the Project site can be seen from portions of I-40 with distanced views of the Modified Project (Figure 4.13-18). It should be noted that KOP 4 has been revised from its previous location to better represent the distanced view from I-40. Figures 4.13-15 through 4.13-17 show existing and modified views, respectively, from KOP 4 (because this KOP was not presented in

the Approved Project's record, a permitted view is not available). The Modified Project would be significantly less visually prominent than the Approved Project due to the partial substitution of PV modules for SunCatchers. While this KOP shows impacts that would be expected to be less than significant, the scale of the Project, especially when viewed along I-40, represents a significant change to the visual character of the viewshed. As such, the Modified Project, while reducing impacts to visual resources, would result in significant, unmitigable, adverse impacts.

4.13.2.2.5 KOP 5: View from Eastbound I-40

KOP 5 is typical of the visual environment, where the Project site can be seen, in middle and background views, from eastbound I-40 (Figure 4.13-22). Figures 4.13-19 through 4.13-21 show existing, permitted, and modified views, respectively, from KOP 5. The Commission Decision concluded that visual impacts would be significant due to moderately high viewer concern, high viewer exposure, and the degree of change. The Modified Project would be significantly less visually prominent than the approved Project due to the partial substitution of PV modules for SunCatchers. This KOP shows the scale of development, and the Modified Project would change the visual character of the 4,613-acre Project site. Therefore, while impacts to visual resources would be reduced at KOP 5 under the Modified Project, the impacts would continue to be adverse, unmitigable, and significant.

4.13.2.2.6 KOP 6: Direct View from the Shoulder of Westbound I-40

KOP 6 is typical of the visual environment of views directly adjacent to the Project site. The majority of viewers would be travelers along westbound I-40 (Figure 4.13-26). Figures 4.13-23 through 4.13-25 show existing, permitted, and modified views, respectively, from KOP 6. Although this KOP was not specifically analyzed in the Commission Decision, impacts to viewers along I-40 were concluded to be significant. The Modified Project would be significantly less visually prominent than the Approved Project due to the partial substitution of PV modules for SunCatchers. This KOP shows the scale of development, and the Modified Project would change the visual character of the 4,613-acre Project site. Therefore, while impacts to visual resources would be reduced at KOP 6 under the Modified Project, the impacts would continue to be adverse, unmitigable, and significant.

4.13.2.3 Glint and Glare

The Commission Decision determined that, with the adoption of mitigation measures, the impacts from Project glare would be less than significant. The potential for glint and glare from the PV modules associated with the Modified Project is expected to be substantially less than the glint and glare analyzed for the SunCatcher technology during licensing proceedings. PV technology would primarily absorb rather than reflect sunlight, and, while there is potential for glint and glare under the Modified Project, it would be substantially less than with the Approved Project. Additionally, because the same setback requirements would exist under the Modified Project, impacts from glint and glare are expected to be less significant than those associated with the Approved Project.

4.13.2.4 Nighttime Lighting

Lighting used in the construction and operation of the Modified Project is expected to be similar to the proposed lighting analyzed in the Commission Decision. Therefore, the Modified Project would not cause substantial changes to impacts from nighttime lighting during construction and operation.

4.13.3 Changes in Cumulative Environmental Impacts

The Commission Decision concluded that the anticipated visual impacts from the Approved Project in combination with other past and reasonably foreseeable future projects in the immediate Project viewshed would be cumulatively considerable, significant and unmitigable. Under the Modified Project, no new foreseeable future actions beyond those presented in the Commission Decision have been identified. Impacts on visual resources from the Modified Project are expected to be the same as those presented in the Commission Decision and, therefore, no additional cumulative impacts would occur.

4.13.4 Changes in LORS Conformance and Other Permits

In the Commission Decision, the Commission concluded that, with the implementation of the Conditions, the Approved Project would comply with all applicable LORS. As with the Approved Project, the Modified Project would comply with all applicable LORS, and no new or additional LORS have been identified.

4.13.5 Changes in Proposed Mitigation

No new or more severe impacts requiring additional mitigation would result from the Modified Project. The mitigation measures proposed in the Commission Decision would mitigate impacts associated with the Modified Project to levels that would be less than significant.

4.13.6 Changes in Conditions of Certification

The conforming changes to the Conditions for the Modified Project related to visual resources are:

SURFACE TREATMENT OF NON-MIRROR PROJECT STRUCTURES AND BUILDINGS

VIS-1 To the extent feasible, the project owner shall treat all non-mirror surfaces of all project structures and buildings visible to the public, which specifically does not include PV modules, such that a) their colors minimize visual intrusion and contrast by blending with the existing tan and brown color of the surrounding landscape; b) their colors and finishes do not create excessive glare; and c) their colors and finishes are consistent with local policies and ordinances. The transmission line conductors shall be non-specular and non-reflective, and the insulators shall be non-reflective and non-refractive. This measure shall include coloring of security fencing with vinyl or other non-reflective coating including galvanized steel; or with slats or similar semi-

opaque, non-reflective material, to blend to the greatest feasible extent with the background soil.

The project owner shall submit for CPM and BLM review and approval, a specific Surface Treatment Plan that will satisfy these requirements. The treatment plan shall include:

A description of the overall rationale for the proposed surface treatment, including the selection of the proposed color(s) and finishes;

A list of each major project structure, building, tank, pipe, and wall; the transmission line towers and/or poles; and fencing, specifying the color(s) and finish proposed for each including galvanized steel. Colors must be identified by vendor, name, and number; or according to a universal designation system;

One set of color brochures or color chips showing each proposed color and finish;

A specific schedule for completion of the treatment; and

E. A procedure to ensure proper treatment maintenance for the life of the project.

The project owner shall not specify to the vendors the treatment of any buildings or structures treated during manufacture, or perform the final treatment on any buildings or structures treated in the field, until the project owner receives notification of approval of the treatment plan by the CPM and BLM. Subsequent modifications to the treatment plan are prohibited without CPM and BLM approval.

Verification: At least 90 days prior to specifying to the vendor the colors and finishes of the first structures or buildings that are surface treated during manufacture, the project owner shall submit the proposed treatment plan to the CPM and BLM for review and approval and simultaneously to San Bernardino County for review and comment. The project owner shall provide to the CPM copies of the transmittal letters submitted separately to BLM and San Bernardino County requesting review of the plan. Comments received on the surface treatment plan shall be provided to the CPM.

If BLM and/or the CPM ~~determines~~determine that the plan requires revision, the project owner shall provide a plan with the specified revision(s) for review and approval by BLM and the CPM before any treatments are applied. Any modifications to the treatment plan must be submitted to BLM and the CPM for review and approval.

Prior to the start of commercial operation, the project owner shall notify BLM and the CPM that surface ~~treatment~~treatments of all listed structures and buildings ~~has~~have been completed and ~~they~~that the facilities are ready for inspection ~~and~~. Prior to the scheduled inspection, the project owner shall submit ~~to each one set~~two sets of electronic color

photographs from each of the ~~same~~ key observation points ~~identified in (d) above.~~ to BLM and the CPM. The project owner shall obtain written confirmation from BLM and the CPM that the project complies with the surface treatment plan.

The project owner shall provide a status report regarding surface treatment maintenance in the Annual Compliance Report. The report shall specify a)~~:~~ the condition of the surfaces of all structures and buildings at the end of the reporting year; b) maintenance activities that occurred during the reporting year; and c) the schedule of maintenance activities for the next year.

TEMPORARY AND PERMANENT EXTERIOR LIGHTING

VIS-2 To the extent feasible and consistent with safety and security considerations, the project owner shall design and install all temporary and permanent exterior lighting so that:

lighting does not cause excessive reflected glare;

lighting does not illuminate the nighttime sky;

mounting heights and locations of all lighting fixtures, including roadway lighting, will not allow light to fall on the mirror surfaces of the SunCatchers in the stowed position, and

illumination of the project and its immediate vicinity is minimized as to times of use and extent.

Permanent night lighting shall comply with all applicable standards, practices, and regulations including, and specifically, the following Illuminating Engineering Society documents:

RP-33-99 Lighting for Exterior Environments

TM-1 0-00 Addressing Obtrusive Light (Urban Sky Glow and Light Trespass) in Conjunction with Roadway Lighting

TM-1 5-07 Luminaire Classification System for Outdoor Luminaires

Verification: At least ~~30~~90 days prior to ordering any permanent exterior lighting, the project owner shall contact BLM and the CPM to ~~show compliance with all of~~discuss the ~~above~~ requirements~~. This~~ listed above. Topics to address shall include~~, but not be limited to~~ at a minimum, final lighting plans, fixture and control schedules, fixture and control cut sheets and specifications, a photometric plan showing vertical and horizontal footcandles at all property lines to a height of 20 feet, and the proposed time clock schedule.

Prior to ~~construction and prior to~~project site mobilization and the start of construction, the project owner shall provide a letter to the CPM and BLM acknowledging the requirements for construction lighting and documenting that lighting orders, installation,

and operations will comply with this condition of certification for construction activity lighting.

Within 7 days after the first use of construction lighting, the project owner shall notify the CPM and BLM that the lighting is ready for inspection. If the CPM or BLM require modifications to the lighting, within 15 days of receiving that notification the project owner shall implement the necessary modifications and notify the CPM and BLM that the modifications have been completed.

At least 60 days prior to ordering any permanent exterior lighting, the project owner shall simultaneously submit a lighting management plan for permanent lighting to BLM and the CPM for review and approval. The project owner shall provide to the CPM a copy of the transmittal letter submitted to BLM requesting review of the plan. Comments received on the lighting management plan from BLM shall be provided to the CPM.

If BLM and/or the CPM determine that the plan requires revision, the project owner shall provide a revised plan for review and approval by BLM and the CPM. No work to implement the lighting management plan (e.g., purchasing or ordering fixtures) shall begin until final written approval is received from BLM and the CPM.

Prior to start of commercial operation, the project owner shall notify the CPM and BLM that ~~the~~ installation of ~~the temporary and~~ permanent exterior lighting has been completed and is ready for inspection. If after inspection BLM and/or the CPM ~~notifies~~notify the project owner that modifications to the lighting are needed, within 30 days after receiving the notification the project owner shall implement the modifications and notify the CPM and BLM when the modifications are ~~competed~~completed and ready for inspection. The project owner shall obtain written confirmation from BLM and the CPM that the lighting system complies with the approved plan for the project.

Within 48 hours of receiving a project-related lighting complaint, the project owner shall provide ~~the CPM with~~ a complaint resolution form to the CPM as specified in the Compliance General Conditions, including a proposal to resolve the complaint, and a schedule for ~~implementation of~~implementing the proposed resolution. The project owner shall notify the CPM within 48 hours ~~after completing the resolution~~ of resolving the complaint. A copy of the complaint resolution form report shall be submitted to the CPM within 30 ~~days and included in the Annual Report~~calendar days. The project owner shall report any lighting complaints and document how complaints were resolved in the Annual Compliance Report for the project. All records of lighting complaints shall be kept in the on-site compliance file for the project.

SETBACK OF SUNCATCHERS FROM HIGHWAY I-40.

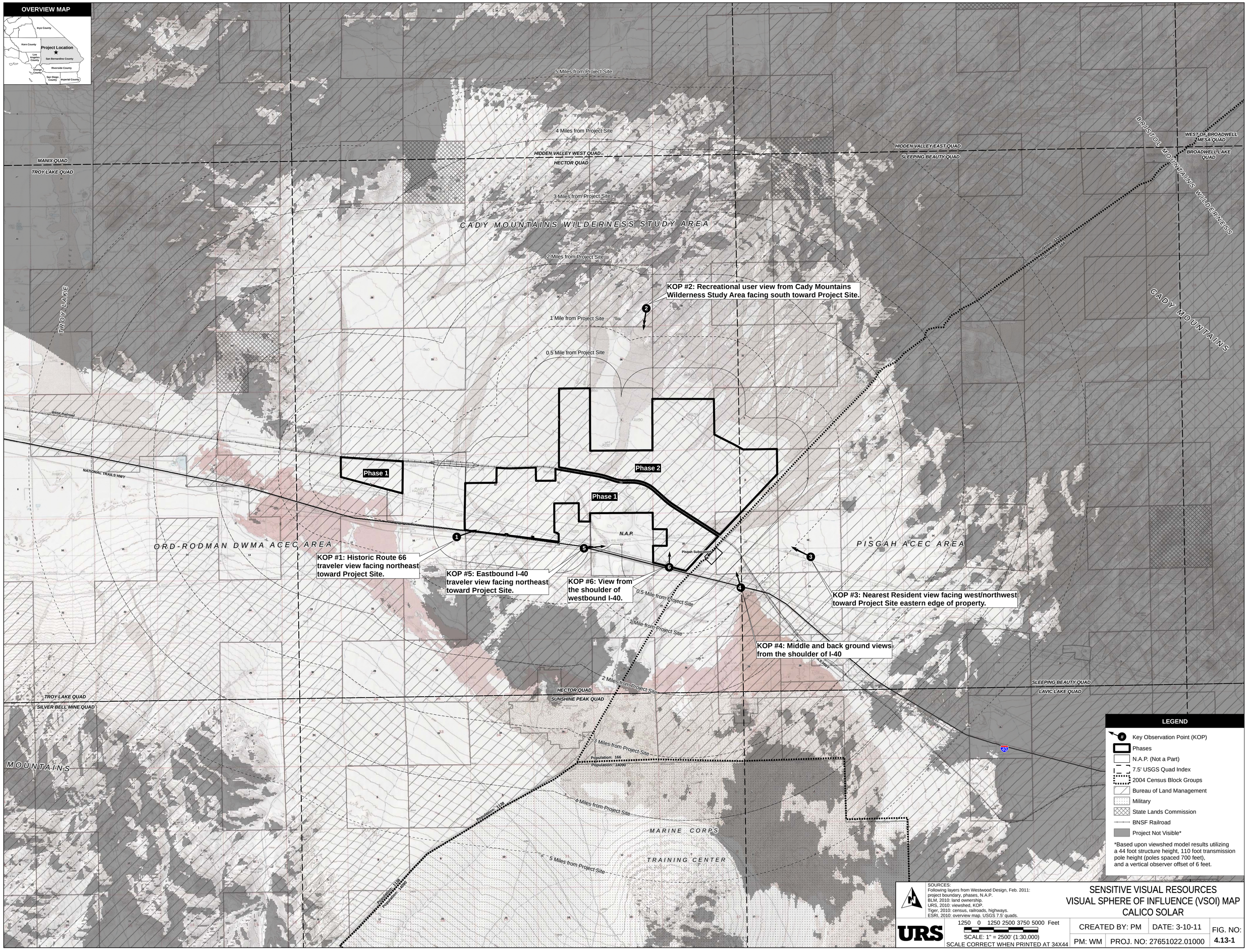
VIS-3 To reduce the visual dominance and glare effects of the SunCatchers to motorists on Highway I-40, the ~~Applicant~~project owner shall set back the nearest units to a minimum distance of 223 feet from the edge of the roadway.

Verification: At least 30 days prior to start of ~~construction~~Pre-Construction Site Mobilization, the project owner shall present to BLM~~'s Authorized Officer~~ and the CPM a revised plan depicting how the proposed SunCatchers will be set back from the highway. If BLM and/or the CPM ~~determines~~determine that the plan requires revision, the project owner shall provide to the CPM a revised plan for review and approval by BLM and the CPM.

The project owner shall not begin construction until receiving BLM and CPM approval of the revised plan.

4.13.7 References Cited

No references other than those presented in the Approved Project's record were used in the preparation of this analysis.


OVERVIEW MAP
Inyo County
Kern County
Project Location
Los Angeles County
San Bernardino County
Orange County
Riverside County
San Diego County
Imperial County
5 Miles from Project Site
4 Miles from Project Site
3 Miles from Project Site
2 Miles from Project Site
1 Mile from Project Site
0.5 Mile from Project Site
CADY MOUNTAINS WILDERNESS STUDY AREA
MANIX QUAD
TROY LAKE QUAD
HIDDEN VALLEY WEST QUAD
HECTOR QUAD
HIDDEN VALLEY EAST QUAD
SLEEPING BEAUTY QUAD
WEST OF BROADWELL MESA QUAD
BROADWELL LAKE QUAD
BRISTOL MOUNTAINS WILDERNESS
CADY MOUNTAINS
TROY LAKE
KOP #2: Recreational user view from Cady Mountains Wilderness Study Area facing south toward Project Site.
BNSF Railroad
NATIONAL TRAILS HWY
Phase 1
Phase 2
Phase 1
N.A.P.
Pisgah Substation
ORD-RODMAN DWMA ACEC AREA
PISGAH ACEC AREA
KOP #1: Historic Route 66 traveler view facing northeast toward Project Site.
KOP #5: Eastbound I-40 traveler view facing northeast toward Project Site.
KOP #6: View from the shoulder of westbound I-40.
KOP #3: Nearest Resident view facing west/northwest toward Project Site eastern edge of property.
KOP #4: Middle and back ground views from the shoulder of I-40
HECTOR QUAD
SUNSHINE PEAK QUAD
TROY LAKE QUAD
SILVER BELL MINE QUAD
SLEEPING BEAUTY QUAD
LAVIC LAKE QUAD
MOUNTAINS
Population: 166
Population: 14090
Population: 1139
MARINE CORPS
TRAINING CENTER
LEGEND
Key Observation Point (KOP)
Phases
N.A.P. (Not a Part)
7.5' USGS Quad Index
2004 Census Block Groups
Bureau of Land Management
Military
State Lands Commission
BNSF Railroad
Project Not Visible*
*Based upon viewshed model results utilizing a 44 foot structure height, 110 foot transmission pole height (poles spaced 700 feet), and a vertical observer offset of 6 feet.
SOURCES:
Following layers from Westwood Design, Feb. 2011:
project boundary, phases, N.A.P.
BLM, 2010: land ownership.
URS, 2010: viewshed, KOP.
Tiger, 2010: census, railroads, highways.
ESRI, 2010: overview map. USGS 7.5' quads.
URS
1250 0 1250 2500 3750 5000 Feet
SCALE: 1" = 2500' (1:30,000)
SCALE CORRECT WHEN PRINTED AT 34X44
SENSITIVE VISUAL RESOURCES
VISUAL SPHERE OF INFLUENCE (VSOI) MAP
CALICO SOLAR
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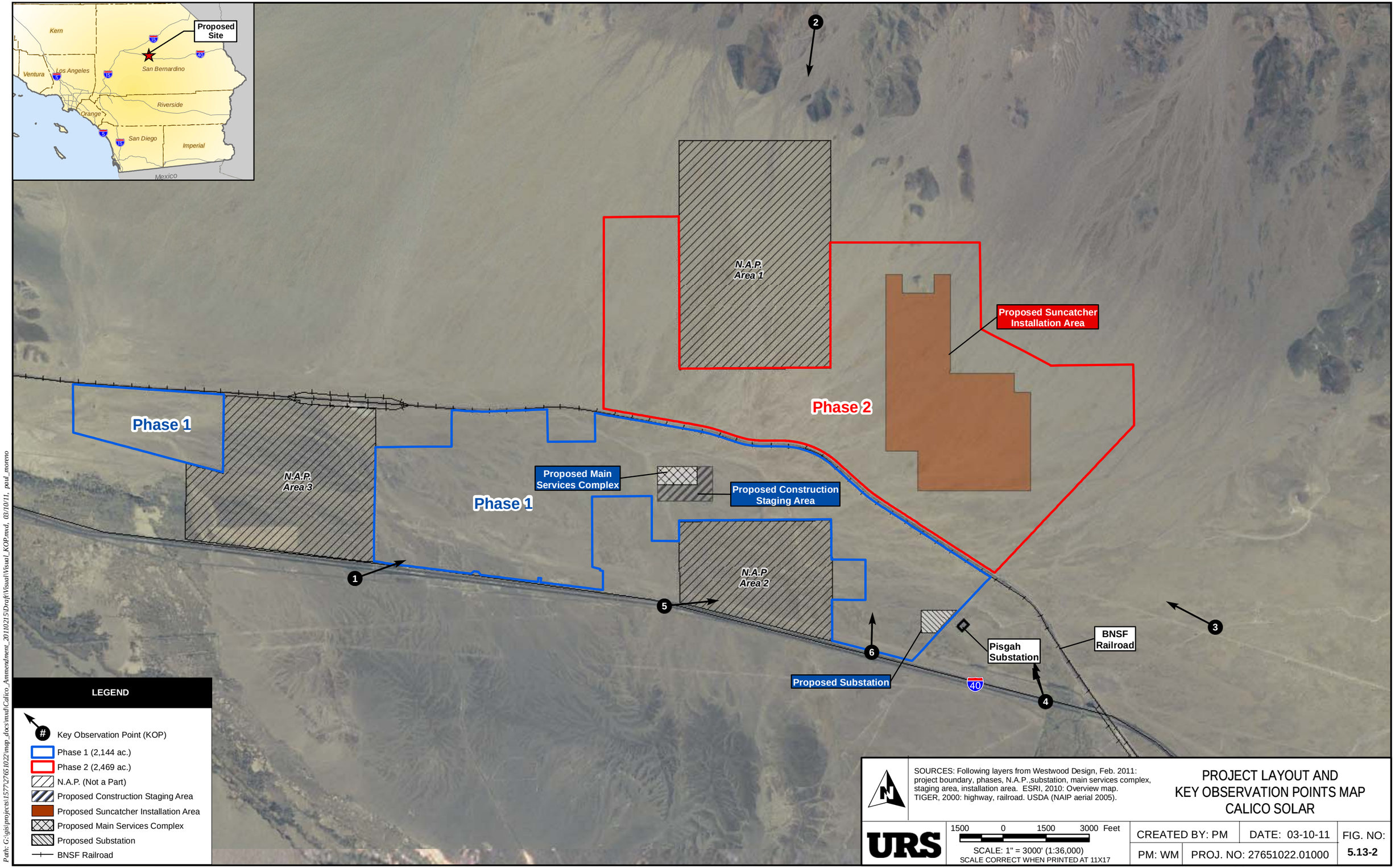
DATE: 3-10-11
FIG. NO:
PM: WM
PROJ. NO: 27651022.01000
4.13-1



SOURCES: Following layers from Westwood Design, Feb. 2011: project boundary, phases, N.A.P.,substation, main services complex, staging area, installation area. ESRI, 2010: Overview map. TIGER, 2000: highway, railroad. USDA (NAIP aerial 2005).

PROJECT LAYOUT AND KEY OBSERVATION POINTS MAP CALICO SOLAR

URS

1500 0 1500 3000 Feet

SCALE: 1" = 3000' (1:36,000)

SCALE CORRECT WHEN PRINTED AT 11X17

CREATED BY: PM	DATE: 03-10-11	FIG. NO:
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EXISTING VIEW OF PROJECT FROM KOP 1
CALICO SOLAR

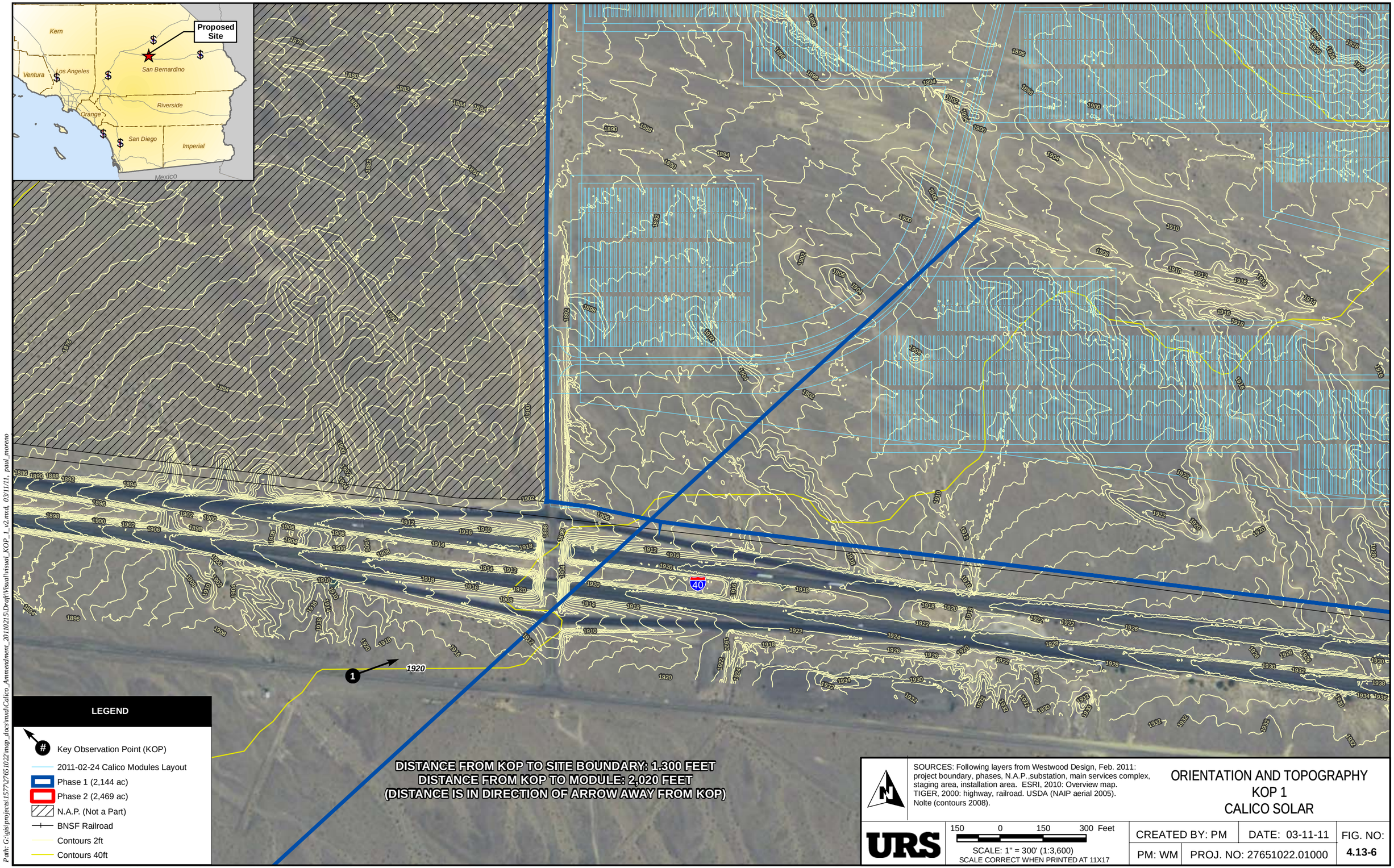
URS	NO SCALE	CREATED BY: CLB	DATE: 03-12-11	FIG. NO: 4.13-3
		PM: AL	PROJ. NO: 27651022.01000	

SIMULATED VIEW OF APPROVED PROJECT FROM KOP 1
CALICO SOLAR

URS	NO SCALE	CREATED BY: CLB	DATE: 03-12-11	FIG. NO: 4.13-4
		PM: AL	PROJ. NO: 27651022.01000	

SIMULATED VIEW OF MODIFIED PROJECT FROM KOP 1
CALICO SOLAR

URS	NO SCALE	CREATED BY: CLB	DATE: 02-24-11	FIG. NO: 4.13-5
		PM: AL	PROJ. NO: 27651022.01000	



SOURCES: Following layers from Westwood Design, Feb. 2011: project boundary, phases, N.A.P.,substation, main services complex, staging area, installation area. ESRI, 2010: Overview map. TIGER, 2000: highway, railroad. USDA (NAIP aerial 2005). Nolte (contours 2008).

ORIENTATION AND TOPOGRAPHY
KOP 1
CALICO SOLAR

URS

150 0 150 300 Feet

SCALE: 1" = 300' (1:3,600)
SCALE CORRECT WHEN PRINTED AT 11X17

CREATED BY: PM	DATE: 03-11-11	FIG. NO:
PM: WM	PROJ. NO: 27651022.01000	4.13-6

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EXISTING VIEW OF PROJECT FROM KOP 2
CALICO SOLAR

URS	NO SCALE	CREATED BY: CLB	DATE: 03-12-11	FIG. NO: 4.13-7
		PM: WM	PROJ. NO: 27651022.01000	

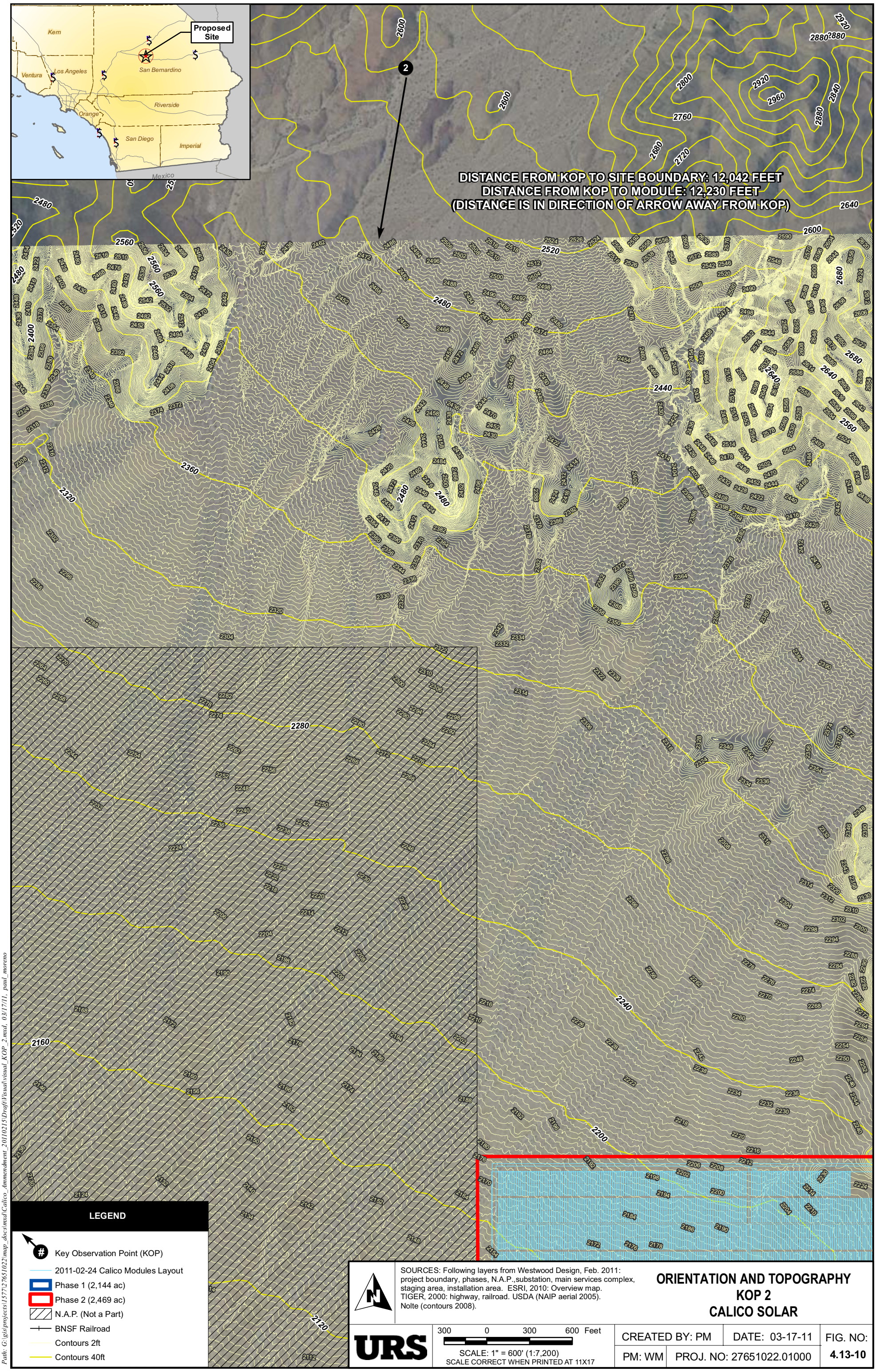
KOP 2: Simulated recreational user view from Cady Mountain WSA (approximately 1 mile from the site), looking south toward the Project site. This photo location is meant to represent "worst-case" recreational views.

SIMULATED VIEW OF APPROVED PROJECT FROM KOP 2
CALICO SOLAR

URS	NO SCALE	CREATED BY: CLB	DATE: 11-14-08	FIG. NO: 4.13-9
		PM: AL	PROJ. NO: 27651022.01000	

SIMULATED VIEW OF MODIFIED PROJECT FROM KOP 2
CALICO SOLAR

URS	NO SCALE	CREATED BY: CLB	DATE: 02-24-11	FIG. NO: 4.13-9
		PM: AL	PROJ. NO: 27651022.01000	



SOURCES: Following layers from Westwood Design, Feb. 2011: project boundary, phases, N.A.P.,substation, main services complex, staging area, installation area. ESRI, 2010: Overview map. TIGER, 2000: highway, railroad. USDA (NAIP aerial 2005). Nolte (contours 2008).

ORIENTATION AND TOPOGRAPHY
KOP 2
CALICO SOLAR

URS

300 0 300 600 Feet

SCALE: 1" = 600' (1:7,200)
SCALE CORRECT WHEN PRINTED AT 11X17

CREATED BY: PM	DATE: 03-17-11	FIG. NO:
PM: WM	PROJ. NO: 27651022.01000	4.13-10

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EXISTING VIEW OF PROJECT FROM KOP 3
CALICO SOLAR

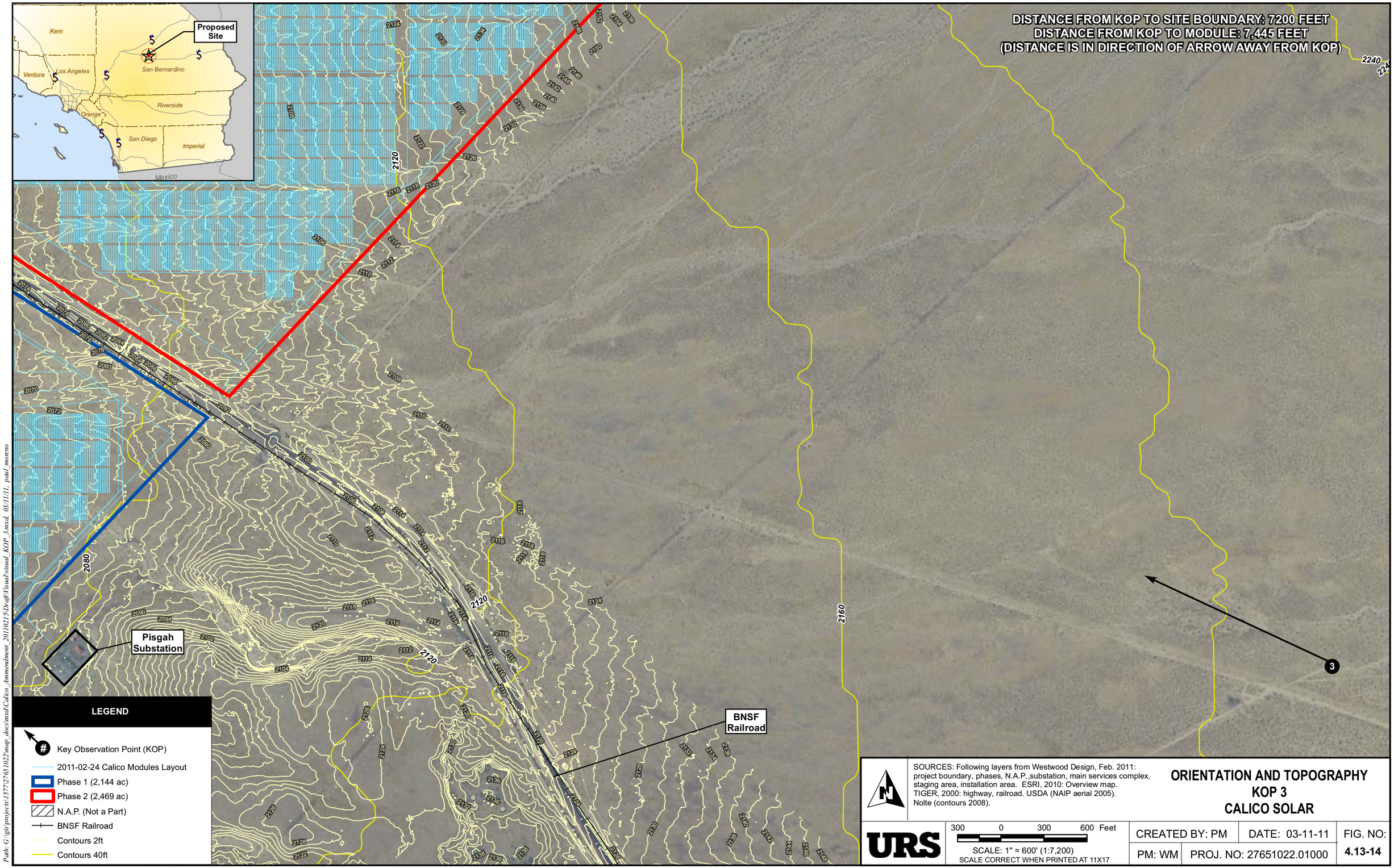
URS	NO SCALE	CREATED BY: CLB	DATE: 03-12-11	FIG. NO: 4.13-11
		PM: AL	PROJ. NO: 27651022.01000	

SIMULATED VIEW OF APPROVED PROJECT FROM KOP 3
CALICO SOLAR

URS	NO SCALE	CREATED BY: CLB	DATE: 03-12-11	FIG. NO: 4.13-12
		PM: AL	PROJ. NO: 27651022.01000	

SIMULATED VIEW OF APPROVED PROJECT FROM KOP 3
CALICO SOLAR PROJECT

URS	NO SCALE	CREATED BY: CLB	DATE: 02-24-11	FIG. NO: 4.13-13
		PM: AL	PROJ. NO: 27651022.01000	



SOURCES: Following layers from Westwood Design, Feb. 2011: project boundary, phases, N.A.P.,substation, main services complex, staging area, installation area. ESRI, 2010: Overview map. TIGER, 2000: highway, railroad. USDA (NAIP aerial 2005). Nolte (contours 2008).

ORIENTATION AND TOPOGRAPHY
KOP 3
CALICO SOLAR

URS

300 0 300 600 Feet

SCALE: 1" = 600' (1:7,200)
SCALE CORRECT WHEN PRINTED AT 11X17

CREATED BY: PM	DATE: 03-11-11	FIG. NO:
PM: WM	PROJ. NO: 27651022.01000	4.13-14

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EXISTING VIEW OF PROJECT FROM KOP 4
CALICO SOLAR PROJECT

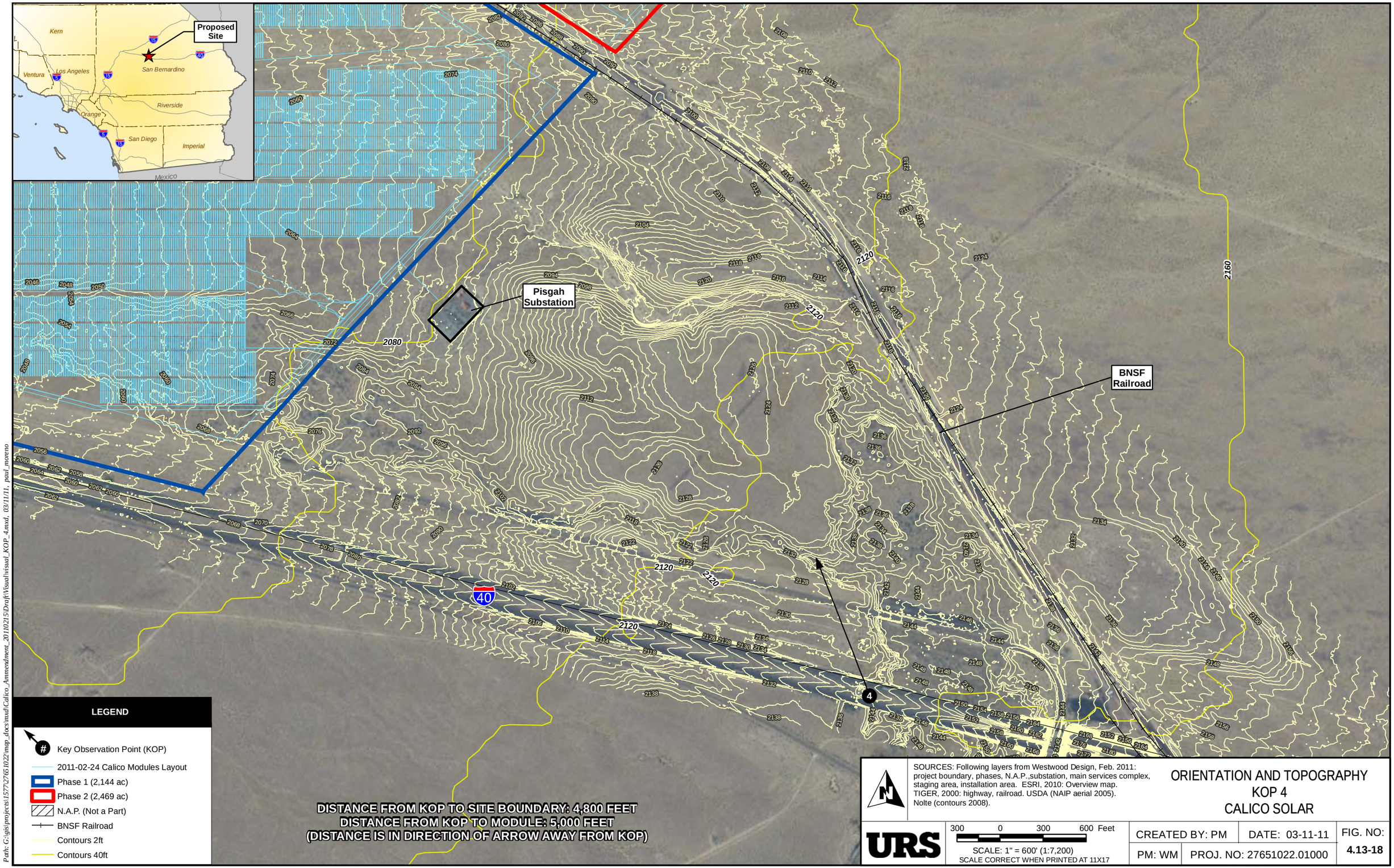
URS	NO SCALE	CREATED BY: CLB	DATE: 02-24-11	FIG. NO: 4.13-15
		PM: AL	PROJ. NO: 27651022.01000	

SIMULATED VIEW OF APPROVED PROJECT FROM KOP 4
CALICO SOLAR

URS	NO SCALE	CREATED BY: CL	DATE: 02-24-11	FIG. NO: 4.13-16
		PM: AL	PROJ. NO: 27651022.01000	

SIMULATED VIEW OF MODIFIED PROJECT FROM KOP 4
CALICO SOLAR

URS	NO SCALE	CREATED BY: CLB	DATE: 02-24-11	FIG. NO: 4.13-17
		PM: AL	PROJ. NO: 27651022.01000	



SOURCES: Following layers from Westwood Design, Feb. 2011: project boundary, phases, N.A.P.,substation, main services complex, staging area, installation area. ESRI, 2010: Overview map. TIGER, 2000: highway, railroad. USDA (NAIP aerial 2005). Nolte (contours 2008).

ORIENTATION AND TOPOGRAPHY
KOP 4
CALICO SOLAR

URS

300 0 300 600 Feet

SCALE: 1" = 600' (1:7,200)
SCALE CORRECT WHEN PRINTED AT 11X17

CREATED BY: PM	DATE: 03-11-11	FIG. NO:
PM: WM	PROJ. NO: 27651022.01000	4.13-18

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EXISTING VIEW OF PROJECT FROM KOP 5
CALICO SOLAR

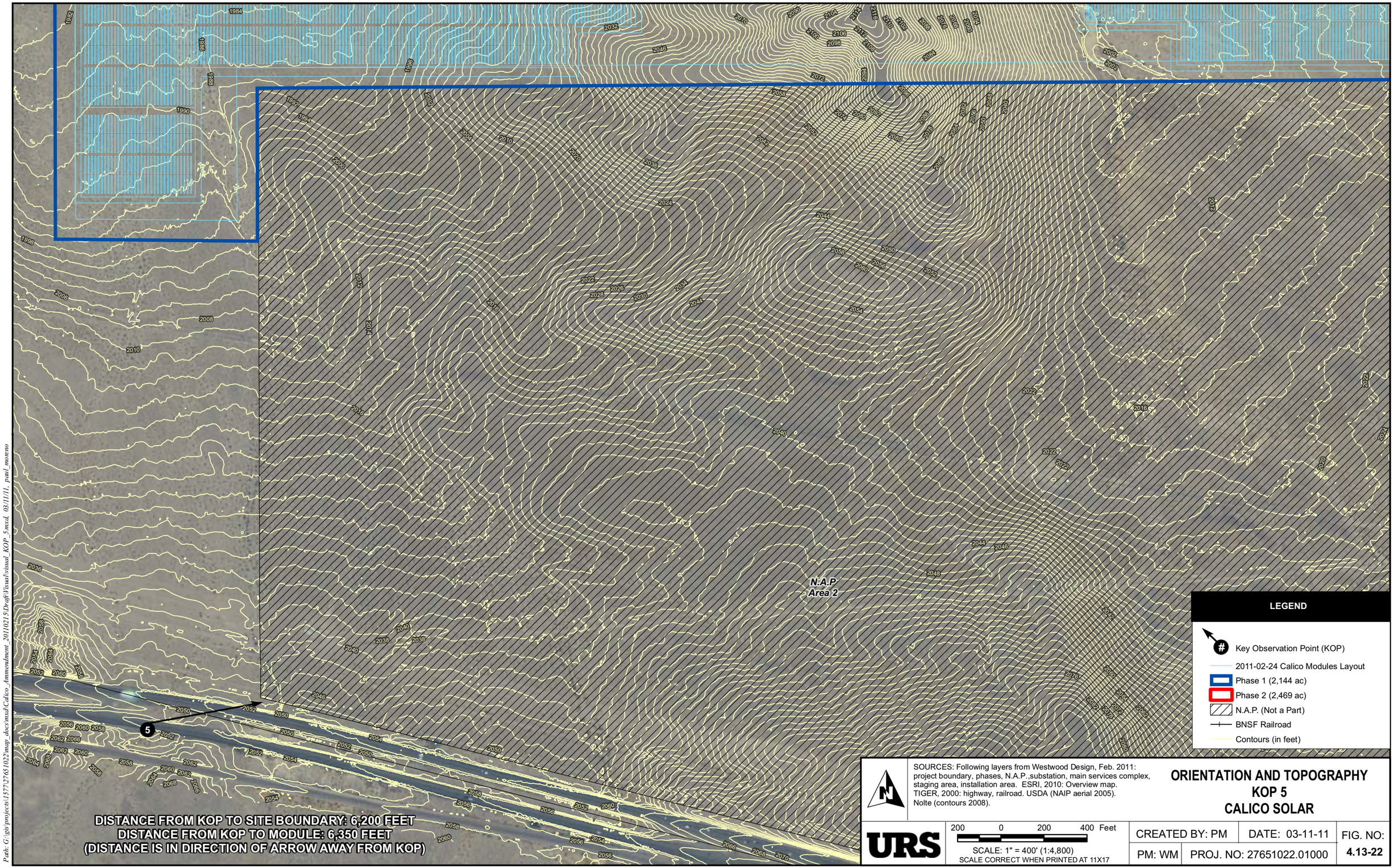
URS	NO SCALE	CREATED BY: CLB	DATE: 03-12-11	FIG. NO: 4.13-19
		PM: AL	PROJ. NO: 27651022.01000	

SIMULATED VIEW OF APPROVED PROJECT FROM KOP 5
CALICO SOLAR

URS	NO SCALE	CREATED BY: CLB	DATE: 03-12-11	FIG. NO: 4.13-20
		PM: AL	PROJ. NO: 27651022.01000	

SIMULATED VIEW OF MODIFIED PROJECT FROM KOP 5
CALICO SOLAR

URS	NO SCALE	CREATED BY: CLB	DATE: 02-24-11	FIG. NO: 4.13-21
		PM: AL	PROJ. NO: 27651022.01000	



SOURCES: Following layers from Westwood Design, Feb. 2011: project boundary, phases, N.A.P.,substation, main services complex, staging area, installation area. ESRI, 2010: Overview map. TIGER, 2000: highway, railroad. USDA (NAIP aerial 2005). Nolte (contours 2008).

ORIENTATION AND TOPOGRAPHY
KOP 5
CALICO SOLAR

URS

200 0 200 400 Feet

SCALE: 1" = 400' (1:4,800)
SCALE CORRECT WHEN PRINTED AT 11X17

CREATED BY: PM	DATE: 03-11-11	FIG. NO:
PM: WM	PROJ. NO: 27651022.01000	4.13-22

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EXISTING VIEW OF PROJECT FROM KOP 6
CALICO SOLAR

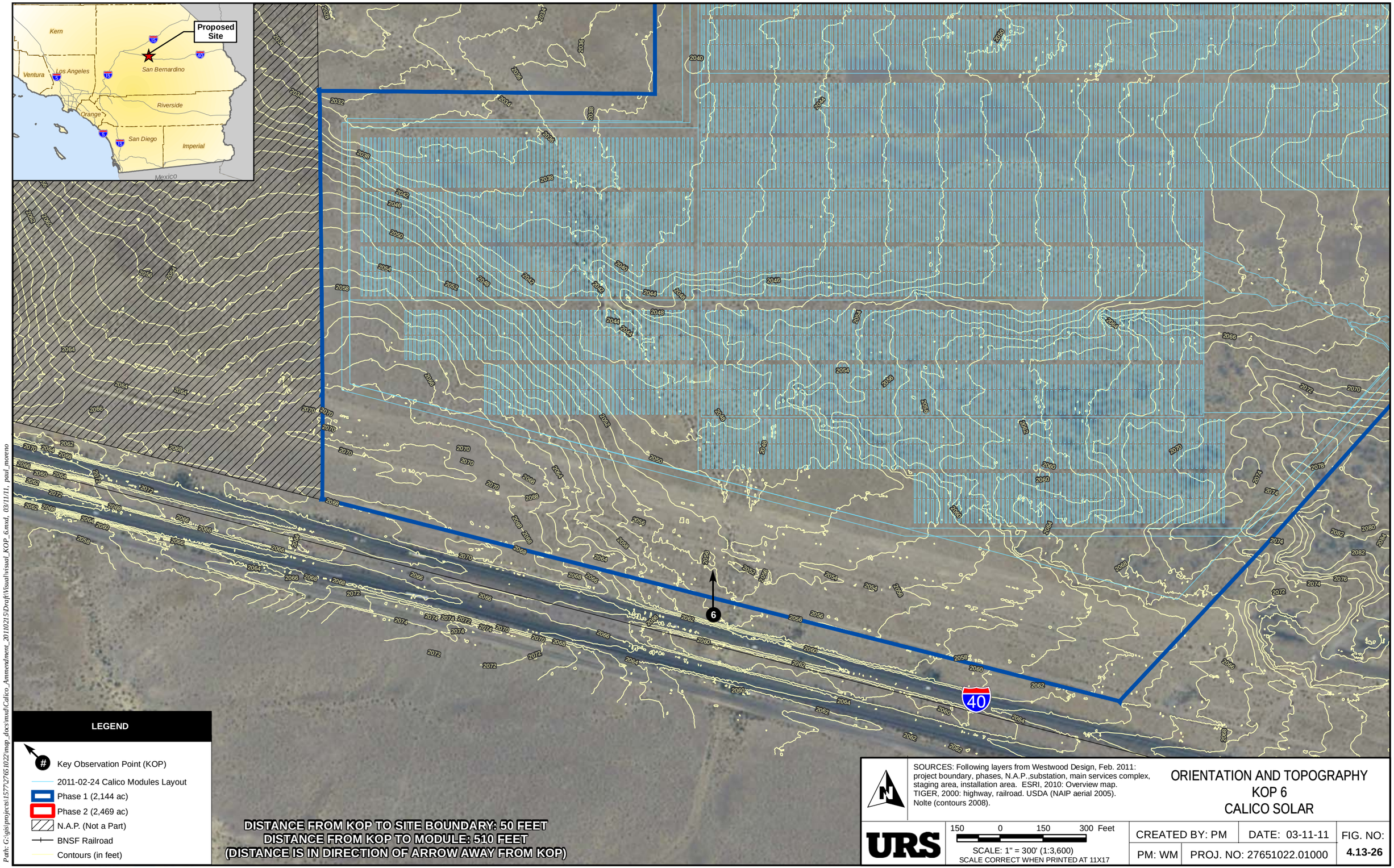
URS	NO SCALE	CREATED BY: CLB	DATE: 03-12-11	FIG. NO: 4.13-23
		PM: AL	PROJ. NO: 27651022.01000	

SIMULATED VIEW OF APPROVED PROJECT FROM KOP 6
CALICO SOLAR

URS	NO SCALE	CREATED BY: CLB	DATE: 03-12-11	FIG. NO: 4.13-24
		PM: WM	PROJ. NO: 27651022.01000	

SIMULATED VIEW OF MODIFIED PROJECT FROM KOP 6
CALICO SOLAR PROJECT

URS	NO SCALE	CREATED BY: CLB	DATE: 02-24-11	FIG. NO: 4.13-25
		PM: AL	PROJ. NO: 27651022.01000	



SOURCES: Following layers from Westwood Design, Feb. 2011: project boundary, phases, N.A.P.,substation, main services complex, staging area, installation area. ESRI, 2010: Overview map. TIGER, 2000: highway, railroad. USDA (NAIP aerial 2005). Nolte (contours 2008).

ORIENTATION AND TOPOGRAPHY
KOP 6
CALICO SOLAR

URS

150 0 150 300 Feet

SCALE: 1" = 300' (1:3,600)
SCALE CORRECT WHEN PRINTED AT 11X17

CREATED BY: PM	DATE: 03-11-11	FIG. NO:
PM: WM	PROJ. NO: 27651022.01000	4.13-26

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4.14 WASTE MANAGEMENT

As described in detail below, to waste management impacts of the Modified Project are expected to be less than or equal to those of the Approved Project and will remain less than significant.

4.14.1 Summary of Project Changes Related to Waste Management

The following sections discuss changes related to waste management during construction and operation of the Modified Project.

4.14.1.1 Construction

Table 4.14-1 sets forth a list of waste streams and waste management methods anticipated during construction of the Modified Project as compared to the Approved Project. All waste quantities expected to be generated during construction of the Modified Project would be equal to or less than the quantities expected to be generated during construction of the Approved Project.

Table 4.14-1
Summary of Construction Waste Streams and Management Methods

Waste Stream and Classification	Origin and Composition	Approved Project Estimated Amount	Modified Project Estimated Amount	On-site Treatment	Waste Management Method
Construction waste – non-hazardous, recyclable	Scrap wood, steel, glass, plastic, or paper	40 cubic yards per week	40 cubic yards per week	Segregation into composition type Store for less than 90 days	Dispose to landfill or recycling facility
Construction waste – hazardous	Empty hazardous material containers	1 cubic yard per week	1 cubic yard per month	Store for less than 90 days	Dispose to hazardous waste disposal facility
	Solvents, used oils, paint, oily rags, cleaners and adhesives	100 gallons every 90 days	100 gallons every 90 days	Store for less than 90 days	Dispose to hazardous waste disposal facility or recycle
	Waste oil including used motor oil, transmission fluid, hydraulic fluid and antifreeze	100 gallons every 90 days	100 gallons	Store for less than 90 days	Dispose to hazardous waste disposal facility or recycle

Table 4.14-1
Summary of Construction Waste Streams and Management Methods
(Continued)

Waste Stream and Classification	Origin and Composition	Approved Project Estimated Amount	Modified Project Estimated Amount	On-site Treatment	Waste Management Method
Spent batteries – hazardous	Lead acid, alkaline type	20 per year	20 per year	Store for less than 90 days	Dispose to recycling facility
Storm water from construction area – non-hazardous	Surface runoff (water, inert material, dirt and concrete particles)	TBD Intermittent – during rainfall events	TBD Intermittent – during rainfall events	None	TBD
Residual solids from retention pond and temporary perforated risers	Soils sediment and concrete particles	50 cubic yards Intermittent – during rainfall events	50 cubic yards Intermittent – during rainfall events	Spread over site	Excavate as needed per Storm Water Pollution Prevention Plan
Sanitary waste – non-hazardous	Portable chemical toilets sanitary waste	250 gallons Daily	250 gallons Daily	None	Pumped to tanker truck by licensed contractors ship to sanitary water treatment plant
Demolition waste - non-hazardous	Concrete and re-bar	TBD Generated during demolition of SunCatcher assembly buildings	TBD Generated during demolition of SunCatcher assembly buildings	None	Dispose to recycling facility or dispose to a non-hazardous waste landfill

Acronym:
TBD – to be determined

4.14.1.2 Operations

Table 4.14-2 sets forth a list of waste streams and waste management methods anticipated during operation of the Modified Project as compared to the Approved Project. All waste quantities expected to be generated during operation of the Modified Project would be equal to or less than those expected to be generated during operation of the Approved Project. The reduction in the number of SunCatchers results in a commensurate reduction in waste due to the operations and maintenance requirements specific to SunCatcher technology. Table 4.14-3 provides an updated list of waste recycling/disposal facilities located in the vicinity of the project site.

Table 4.14-2
Summary of Operations Waste Streams and Management Methods

Waste Stream and Classification	Origin and Composition	Permitted Estimated Amount	Modified Estimated Amount	On-site Treatment	Waste Management Method
Office and packaging materials from supplies deliveries – non-hazardous	Paper, wood, plastic, cardboard	10 cubic yards per week	10 cubic yards per week	Segregation into composition type, store for less than 30 days	Weekly collection for recycling and/or approved waste disposal
Sanitary wastewater solids – non-hazardous	Rest rooms and sanitary waste	5,000 gallons per month	4,000 gallons per month	Store for less than 90 days	Dispose to sanitary waste disposal facility
Spent batteries – hazardous, recyclable	Lead acid, alkaline	250 units per month	250 units per month	Store for less than 30 days	Dispose to authorized waste recycle facility
PCU oil and motor oil – hazardous, recyclable	PCU overhaul	21 gallons per month	5 gallons per month	One 100 U.S.-gallon tank for filtering and re-use in PCU	Recycle
PCU coolant – ethylene glycol – hazardous	PCU overhaul	21 gallons per month	5 gallons per month	Store for less than 90 days	Dispose to authorized waste disposal facility
PCU hydrogen gas – non-hazardous, recyclable	PCU overhaul	100 k-bottles per month	15 k-bottles per month	Store for less than 90 days	Empty k-bottles returned through supplier
Oily absorbent and spent oil filters – hazardous, recyclable	PCU and hydraulic equipment overhauls	One 55-gallon drum per month	One 55-gallon drum per month	Store for less than 90 days	Dispose to authorized recycle facility
Oily rags – non-hazardous	PCU and hydraulic equipment overhauls	One 55-gallon drum per month	One 55-gallon drum per month	Store for less than 90 days	Launder at authorized recycle facility then re-use
Used hydraulic fluid, oils and grease – hazardous, recyclable	PCU and hydraulic equipment overhauls	Less than 11 gallons per month	Less than 10 gallons per month	Store for less than 90 days	Dispose to authorized recycle facility
De-mineralized water treatment wastewater salt cake – non-hazardous or designated waste	RO discharge process mineral deposits and salts	900,000 pounds per year	65,750 pounds per year	Evaporative pond containment	Non-hazardous waste disposal facility

Acronyms:
PCU – power conversion unit
RO – reverse osmosis

Table 4.14-3
Waste Recycling/Disposal Facilities

Waste Disposal Site	Title 23 Class	Permitted Throughput	Permitted Capacity	Remaining Capacity	Estimated Closure Date	Enforcement Action Taken?
Solids Recycling						
Barstow Sanitary Landfill (Solid Waste Facility) 32553 Barstow Road Barstow, CA 92311	Class III	1,500 tons per day	80.5 million cubic yards	924,401 cubic yards	2071	No
Victorville Sanitary Landfill (Solid Waste Facility) 18600 Stoddard Wells Road Victorville, CA 92307	Class III	3,000 tons per day	83.million cubic yards	81.5 million cubic yards	2047	No
Newberry Springs Med. Vol. T/P Facility (Solid Waste Facility) Troy Road And Poniente Drive Newberry Springs, CA 92365	Class III	15 tons per day	15 tons per day	Not available	Not available	No
USMC - Twentynine Palms Disposal Facility Landfill Road Twentynine Palms, CA 92278	Class III	100 tons per day	10.9 million cubic yards	10.8 million cubic yards	2076	No
American Remedial Technologies (Solids Recycling) 2680 Seminole Avenue Lynwood, CA 90262	Not Applicable	25,000 tons per month	300,000 tons per year	Not applicable	Not applicable	No
TPST Soil Recyclers of California (Soil Recycling) 12328 Hibiscus Avenue Adelanto, CA 92301	Not Applicable	1,350 tons per day	350,000 tons per year	Not applicable	Not applicable	No

Table 4.14-3
Waste Recycling/Disposal Facilities
(Continued)

Waste Disposal Site	Title 23 Class	Permitted Throughput	Permitted Capacity	Remaining Capacity	Estimated Closure Date	Enforcement Action Taken?
Thermal Remediation Solutions (Solids Recycling) 1211 West Gladstone Avenue Azusa, CA 91702	Class III	6,500 tons per day	66.7 million cubic yards	34.1million cubic yards	2025	No
Chemical Waste Management Kettleman Hills Landfill (Solids Waste Facility) 36251 Old Skyline Road Kettleman City, CA 93239	Class I	8,000 tons per day	10.7 million cubic yards	6 million cubic yards	Not Available	No
Clean Harbors Buttonwouldow Landfill (Solid Waste Facility) Lokern Road Kern County, CA	Class I	10,482 tons per day	14.3 million cubic yards	Not available	2040	No
Liquids Recycling						
DeMenno/Kerdoon 2000 North Alameda Street Compton, CA 90222	Not applicable	84.1 million gallons per year of oily water and 123 million gallons per year of waste oil	Approximately 30 million gallons per year	Not applicable	Not applicable	No

Source: CIWMB Solid Waste Inventory System Database, 2011

4.14.2 Changes in Environmental Impacts

The analysis of impacts related to waste management, under the Modified Project, is based on significance criteria contemplated for the Approved Project.

4.14.2.1 Construction

Based on Table 4.14-1, the types and quantities of wastes generated and the management methods for such wastes during construction of the Modified Project would be consistent with the wastes and management methods contemplated for the Approved Project. For both the Approved Project and the Modified Project, solid waste, non-recyclable waste, and hazardous and non-hazardous waste would be treated in a similar manner. Therefore, the Modified Project's waste management impacts would be less than or equal to impacts under the Approved Project and would be less than significant.

4.14.2.2 Operations

Based on Table 4.14-2, the types of wastes generated and the management methods for such wastes during operation of the Modified Project would be consistent with the wastes and management methods contemplated for the Approved Project; the quantities of wastes would be reduced. The reduction in sanitary wastewater amounts can be attributed to the reduction in the Project workforce. Because the Modified Project would utilize fewer SunCatchers, the wastes specific to SunCatcher technology would be reduced (e.g. waste associated with PCUs, waste hydrogen k-bottles, etc.). Further, because the need for demineralized water would be reduced (the Modified Project would require less water for washing PV modules and SunCatcher mirrors, which is the predominant water use requiring RO treatment), the amount of demineralized water treatment wastewater salt cakes would decrease. Therefore, the Modified Project's waste management impacts from operation are anticipated to be less than or equal to the impacts under the Approved Project and would be less than significant.

4.14.3 Changes in Cumulative Environmental Impacts

The Commission Decision concluded that the waste generated by the Approved Project during construction and operation would not result in any significant cumulative impacts to waste management. Incremental impacts of the Modified Project on waste management are expected to be the same or slightly reduced compared to the Approved Project. As described in Section 4.23, Cumulative Scenario, no new reasonably foreseeable future actions beyond those assumed in the Commission Decision have been identified. Therefore, no increase in cumulative impacts under the Modified Project is anticipated.

4.14.4 Changes in LORS Conformance and Other Permits

In the Commission Decision, the Commission concluded that, with the implementation of the Conditions, the Approved Project would comply with all applicable LORS. As with the Approved Project, the Modified Project would comply with all applicable LORS, and no new or additional LORS have been identified.

The Commission Decision stated that the following permit would be required for the Approved Project prior to generating any hazardous waste during Project construction or operations: hazardous waste

generator permit/identification number from the United States Environmental Protection Agency (EPA ID number). The Modified Project would not necessitate any permits beyond what was identified in the Commission Decision.

4.14.5 Changes in Proposed Mitigation

No new or more severe impacts requiring additional mitigation would result from the Modified Project. The mitigation measures proposed in the Commission Decision would mitigate impacts associated with the Modified Project to levels that would be less than significant.

4.14.6 Changes in Conditions of Certification

The conforming changes to the Conditions for the Modified Project related to waste management are:

WASTE-1 The project owner shall provide the resume of an experienced and qualified professional engineer or professional geologist, who shall be available during site characterization (if needed), demolition, excavation, and grading activities, to the CPM for review and approval. The resume shall show experience in remedial investigation and feasibility studies.

The professional engineer or professional geologist shall be given authority by the project owner to oversee any earth moving activities that have the potential to disturb contaminated soil and impact public health, safety and the environment.

Verification: At least 30 days prior to the start of ~~site mobilization~~Pre-Construction Site Mobilization , the project owner shall submit the resume to the CPM for review and approval.

WASTE-2 If potentially contaminated soil is identified during site characterization, demolition, excavation or grading at either the proposed site or linear facilities, as evidenced by discoloration, odor, detection by handheld instruments, or other signs, the professional engineer or professional geologist shall inspect the site, determine the need for sampling to confirm the nature and extent of contamination, and provide a written report to the project owner, representatives of Department of Toxic Substances Control or Regional Water Quality Control Board, and the CPM stating the recommended course of action.

Depending on the nature and extent of contamination, the professional engineer or professional geologist shall have the authority to temporarily suspend construction activity at that location for the protection of workers or the public. If in the opinion of the professional engineer or professional geologist, significant remediation may be

required, the project owner shall contact the CPM and representatives of the Department of Toxic Substances Control or Regional Water Quality Control Board, for guidance and possible oversight.

Verification: The project owner shall submit any reports filed by the professional engineer or professional geologist to the CPM within five days of their receipt. The project owner shall notify the CPM within 24 hours of any orders issued to halt construction.

WASTE-3 The project owner shall prepare a Construction Waste Management Plan for all wastes generated during construction of the facility and shall submit the plan to the CPM for review and approval prior to the start of construction. The plan shall contain, at a minimum, the following:

A description of all construction waste streams, including projections of frequency, amounts generated, and hazard classifications; and

Management methods to be used for each waste stream, including temporary on-site storage, housekeeping and best management practices to be employed, treatment methods and companies providing treatment services, waste testing methods to assure correct classification, methods of transportation, disposal requirements and sites, and recycling and waste minimization/source reduction plans.

Verification: The project owner shall submit the Construction Waste Management Plan to the CPM for approval no less than 30 days prior to the ~~initiation of construction activities at the site~~starts of Pre-Construction Site Mobilization.

WASTE-4 The project owner shall obtain a hazardous waste generator identification number from the United States Environmental Protection Agency (USEPA) prior to generating any hazardous waste during project construction and operations.

Verification: The project owner shall keep a copy of the identification number on file at the project site and provide documentation of the hazardous waste generation and notification and receipt of the number to the CPM in the next scheduled Monthly Compliance Report after receipt of the number. Submittal of the notification and issued number documentation to the CPM is only needed once unless there is a change in ownership, operation, waste generation, or waste characteristics that requires a new notification to USEPA. Documentation of any new or revised hazardous waste generation notifications or changes in identification number shall be provided to the CPM in the next scheduled compliance report.

WASTE-5 Upon notification of any impending waste management-related enforcement action by any local, state, or federal authority, the project owner shall notify the CPM of any such action taken or proposed against the project

itself, or against any waste hauler or disposal facility or treatment operator with which the owner contracts, and describe how the violation will be corrected.

Verification: The project owner shall notify the CPM in writing within 10 days of becoming aware of an impending enforcement action. The CPM shall notify the project owner of any changes that will be required in the way project-related wastes are managed.

WASTE-6 The project owner shall provide a reuse/recycling plan for at least 50 percent of construction and demolition materials prior to any building or demolition. The project owner shall ensure compliance and shall provide proof of compliance documentation to the CPM, including a recycling and reuse summary report, receipts, and records of measurement. Project mobilization and construction shall not proceed until the CPM issues an approval document.

Verification: At least 60 days prior to the start of any construction or demolition activities, the project owner shall submit a reuse recycling plan to the CPM for review and approval. The project owner shall ensure that project activities are consistent with the approved reuse/recycling plan and provide adequate documentation of the types and volumes of wastes generated, how the wastes were managed, and volumes of wastes diverted. Project mobilization and construction shall not proceed until CPM issues an approval document. Not later than 60 days after completion of project construction, the project owner shall submit documentation of compliance with the diversion program requirements to the CPM. The required documentation shall include a recycling and reuse summary report along with all necessary receipts and records of measurement from entities receiving project wastes.

WASTE-7 The project owner shall prepare an Operation Waste Management Plan for all wastes generated during operation of the proposed project and shall submit the plan to the CPM for review and approval. The plan shall contain, at a minimum, the following:

A detailed description of all operation and maintenance waste streams, including projections of amounts to be generated, frequency of generation, and waste hazard classifications;

Management methods to be used for each waste stream, including temporary on-site storage, housekeeping and best management practices to be employed, treatment methods and companies providing treatment services, waste testing methods to assure correct classification, methods of transportation, disposal requirements and sites, and recycling and waste minimization/source reduction plans;

Information and summary records of conversations with the local Certified Unified Program Agency and the Department of Toxic Substances Control regarding any waste management requirements necessary for project activities. Copies of all required waste management permits, notices, and/or authorizations shall be included in the plan and updated as necessary;

A detailed description of how facility wastes will be managed, and any contingency plans to be employed, in the event of an unplanned closure or planned temporary facility closure; and

A detailed description of how facility wastes will be managed and disposed of upon closure of the facility.

Verification: The project owner shall submit the Operation Waste Management Plan to the CPM for approval no less than 30 days prior to the start of ~~project~~commercial operation. The project owner shall submit any required revisions to the CPM within 20 days of notification from the CPM that revisions are necessary.

The project owner shall also document in each Annual Compliance Report the actual volume of wastes generated and the waste management methods used during the year; provide a comparison of the actual waste generation and management methods used to those proposed in the original Operation Waste Management Plan; and update the Operation Waste Management Plan as necessary to address current waste generation and management practices.

WASTE-8 The project owner shall ensure that all spills or releases of hazardous substances, hazardous materials, or hazardous waste are documented and cleaned up and that wastes generated from the release/spill are properly managed and disposed of, in accordance with all applicable federal, state, and local requirements.

Verification: The project owner shall document management of all unauthorized releases and spills of hazardous substances, hazardous materials, or hazardous wastes that occur on the project property or related linear facilities. The documentation shall include, at a minimum, the following information: location of release; date and time of release; reason for release; volume released; how release was managed and material cleaned up; amount of contaminated soil and/or cleanup wastes generated; if the release was reported; to whom the release was reported; release corrective action and cleanup requirements placed by regulating agencies; level of cleanup achieved and actions taken to prevent a similar release or spill; and disposition of any hazardous wastes and/or contaminated soils and materials that may have been generated by the release. A copy of the unauthorized release/spill documentation shall be provided to the CPM within 30 days of the date the release was discovered.

4.14.7 References Cited

No references other than those presented in the Approved Project's record were used in the preparation of this analysis.

4.15 HAZARDOUS MATERIALS MANAGEMENT

As described in detail below impacts of the Modified Project to hazardous materials management are expected to be less than or equal to those of the Approved Project and will remain less than significant.
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4.15.1 Summary of Project Changes Related to Hazardous Materials Management

The Modified Project proposes to utilize single-axis tracking PV modules for the majority of the Project's electrical generation and fewer SunCatchers. The reduction in SunCatchers would have a commensurate reduction in hydrogen production and storage. The SunCatcher hydrogen generation system would be located north of the railroad within the SunCatcher area. Hydrogen would not be generated or stored south of the railroad.

4.15.1.1 Construction Phase

Tables 4.15-1 and 4.15-2 provide an amended summary of the hazardous materials to be used and stored during construction of the Modified Project as compared to the Approved Project. These tables identify, respectively, the hazardous materials to be used during construction based on the characteristics criteria identified in Title 22 of the CCR, and based on the properties of the substances themselves.

Table 4.15-1
Hazardous Materials Use and Storage during Construction
Based on Title 22 Hazardous Characterization

Material	Hazardous Characteristics	Purpose	Storage Location	Maximum Stored (Approved Project)	Maximum Stored (Modified Project)	Storage Type
Diesel fuel	Ignitability	Refueling construction vehicles and equipment	Equipment Service Area	4,000 gallons	4,000 gallons	Tank
Diesel fuel	Ignitability	Refueling truck	Equipment Service Area/mobile	1,000 gallons	1,000 gallons	Truck
Gasoline	Ignitability	Refueling construction vehicles and equipment	Equipment Service Area	1,000 gallons	1,000 gallons	Tank
Gasoline	Ignitability	Refueling truck	Equipment Service Area/mobile	1,000 gallons	1,000 gallons	Truck
Acetylene	Ignitability	Welding	Equipment Service Area	500 cubic feet	500 cubic feet	Cylinders
Oxygen	Ignitability	Welding	Equipment Service Area	500 cubic feet	500 cubic feet	Cylinders

Source: Calico Solar, LLC, 2011

Table 4.15-2
Hazardous Materials Use and Storage during Construction
Based on Material Properties

Material	Hazardous Characteristics[1]	Purpose	Storage Location	Maximum Stored (Approved Project)	Maximum Stored (Modified Project)	Storage Type
Lubricating oil	Mildly toxic	Lubricating equipment parts	Equipment Service Area	500 gallons	500 gallons	Tanks
Hydraulic oil	Mildly toxic	Lubricating equipment parts	Equipment Service Area	1,500 gallons	1,500 gallons	Tanks
Grease	Mildly toxic	Lubricating equipment parts	Equipment Service Area	45 gallons	45 gallons	Drum
Ethylene Glycol	Mildly toxic	Coolant, antifreeze	Equipment Service Area	500 gallons	500 gallons	Tanks
Cleaning chemicals/ detergents	Toxicity, irritant	Periodic cleaning	Equipment Service Area	150 gallons	150 gallons	Drums or small containers

Source: Calico Solar, LLC, 2011

4.15.1.2 Operations Phase

Tables 4.15-3 and 4.15-4 provide an amended summary of hazardous materials to be used or stored on site during operation of the Modified Project as compared to the Approved Project. These two tables list the materials to be used during regular operation that can be characterized as hazardous based on Title 22 criteria and the properties of the materials, respectively.

Table 4.15-3
Hazardous Materials Use and Storage during Operation
Based on Title 22 Hazardous Characterization

Material	Hazardous Characteristics	Purpose	Storage Location	Maximum Stored (Approved Project)	Maximum Stored (Modified Project)	Storage Type
Hydrogen	Ignitability	PCU working fluid	Generated on site in pressure vessel k-bottles mounted on each SunCatcher, and within Stirling Engine	23,000 pounds for centralized system or 116,000 pounds for a distributed system	2,760 pounds for a centralized system or 13,392 pounds for a distributed system. Usage of 5,000 cubic feet per day	Pressure vessel on site. 10 cubic feet within each SunCatcher (4,000 SunCatchers) 196 cubic feet in each k-bottle (20 k-bottles)
Acetylene	Ignitability	Welding	Maintenance buildings	1,000 cubic feet	1,000 cubic feet	Cylinders
Oxygen	Ignitability	Welding	Maintenance buildings	1,000 cubic feet	1,000 cubic feet	Cylinders
Various solvents, detergents, paints, water treatment chemicals and other cleaners	Toxicity	Building maintenance and equipment cleaning	Maintenance buildings	Ten (10) 55-gallon drums and commercial 1-gallon containers	Twelve (12) 55-gallon drums commercial 1-gallon containers	Drums and aboveground containers
Gasoline	Ignitability	Maintenance vehicles	PCU radiator Maintenance buildings	5,000 gallons	5,000 gallons	Aboveground storage tank
Diesel fuel	Ignitability	Firewater pump Maintenance Vehicles	Firewater skid refueling station with containment	100 gallons initial fill 5,000 gallons	100 gallons initial fill 5,000 gallons	Firewater skid. Aboveground storage tank (refueling station)

Source: Calico Solar, LLC, 2011
Acronyms/Notes:
PCU – power conversion unit

Table 4.15-4
Hazardous Materials Use and Storage during Operation
Based on Material Properties

Material	Hazardous Characteristics	Purpose	Storage Location	Maximum Stored (Approved Project)	Maximum Stored (Modified Project)	Storage Type
Insulating oil	Mildly toxic	Electrical equipment	Electrical equipment	60,000 gallons initial fill	25,000 gallons initial fill	Equipment transformers and electrical switches
Lubricating oil and grease	Mildly toxic	Stirling engine/dish drives PCU & Misc. PV Tracker parts	Maintenance buildings	40,000 gallons initial fill with use of 21 gallons per month	6,000 gallons initial fill	Equipment 150-gallon recycle tank, aboveground container
Ethylene glycol	Mildly toxic	PCU radiator coolant, antifreeze	Maintenance buildings	40,000 gallons initial fill with use of 21 gallons per month	5,000 gallons initial fill	Aboveground containers
Sodium hypochlorite 12.5 percent solution (bleach)	Toxicity	Disinfectant for potable water	Water treatment structure	4 gallons	4 gallons	Aboveground container

Source: Calico Solar, LLC, 2011
Acronyms/Notes:
PCU – power conversion unit
PV - photovoltaic

4.15.1.2.1 Changes to the Hydrogen System

During Phase 1 of the Modified Project, no hydrogen would be used or stored on site. A total of 100.5 MW of the power generated in Phase 2 would be produced using the SunCatcher technology, which would include hydrogen both in the SunCatchers and in the associated equipment.

Under the Approved Project, two types of hydrogen systems were considered for the SunCatcher system: (1) a centralized system and (2) a distributed system to generate/deliver hydrogen on site and distribute the same to the SunCatchers and associated equipment. Both systems are still under consideration for the Modified Project, but on a much smaller scale.

In the Approved Project, the SunCatcher technology would use hydrogen in amounts that required an Off-site Consequence Analysis (OCA) to assess the impact from a worst-case release scenario. The original OCA was based on 34,000 SunCatchers (based on project output of 850 MW), which would require the use and storage of 23,000 pounds of hydrogen for the centralized system and 116,000 pounds of hydrogen for the distributed system. The OCA showed no significant impact to off-site sensitive receptors from such an event.

The Modified Project would consist of only 4,000 SunCatchers, which would result in an 88 percent reduction in terms of number of SunCatchers proposed and hydrogen that would require storage. Using a

corresponding ratio, this would translate into approximately 2,760 pounds of hydrogen for the centralized system and approximately 13,392 pounds of hydrogen for the distributed system under the Modified Project.

4.15.2 Changes to Environmental Impacts

The analysis of impacts related to handling of hazardous materials under the Modified Project is based on the significance criteria as contemplated for the Approved Project.

4.15.2.1 Construction

The types and amounts of hazardous materials to be used during construction under the Modified Project are the same in type and amount as the hazardous materials as contemplated for the Approved Project. Therefore, the Modified Project's impacts to public health and safety associated with the use of hazardous materials during construction would be no different than the impacts from the Approved Project and would remain less than significant.

4.15.2.2 Operations

The types of hazardous materials that would be used during operation under the Modified Project would be consistent with the hazardous materials contemplated for the Approved Project, with the amounts of chemicals, such as lubricating oils, mineral oils, ethylene glycol and hydrogen, decreasing substantially. Results from the OCA modeling completed as part of the Approved Project's licensing proceedings demonstrated that an accidental release of hydrogen, under conservative worst-case scenario conditions, would not impact the public or environmental receptors in the vicinity of the Project site, even for the much larger SunCatcher system proposed as part of the Approved Project. The OCA presented for the Approved Project proposed to use a system consisting of 34,000 SunCatchers. For the Modified Project, the proposed system would consist of only 4,020 SunCatchers, which is an approximately 88 percent decrease over the original system. It is estimated that the system under the Modified Project, using 88 percent less hydrogen, would lead to a corresponding decrease in the impacted area presented in the OCA prepared for the Approved Project.

The Modified Project would not alter the conclusion that there would be no significant impacts to off-site sensitive receptors in the event of a worst-case release scenario. Impacts to public health and safety associated with the use of hazardous materials during operation of the Modified Project would be no different than from the Approved Project and would remain less than significant.

4.15.3 Changes in Cumulative Environmental Impacts

The Commission Decision concluded that the Approved Project would not result in any significant cumulative impacts to hazardous materials management. Incremental impacts of the Modified Project on hazardous materials management are expected to be the same or slightly reduced compared to the Approved Project. As described in Section 4.23, Cumulative Scenario, no new reasonably foreseeable future actions beyond those assumed in the Commission Decision have been identified. Therefore, no increase in cumulative impacts under the Modified Project is anticipated.

4.15.4 Changes in LORS Conformance and Other Permits

In the Commission Decision, the Commission concluded that, with the implementation of the Conditions, the Approved Project would comply with all applicable LORS. As with the Approved Project, the Modified Project would comply with all applicable LORS, and no new or additional LORS have been identified.

Federal Risk Management Plan (RMP) regulations impose a threshold for hydrogen of 10,000 pounds, (40 Code of Federal Regulations (CFR) 68, Table 1). California Accidental Release Prevention regulations impose a threshold for hydrogen (at any concentration) of 10,000 pounds (19 California Code of Regulations (CCR) 2770.5 Table 3). Facilities that store or use over 10,000 pound of hydrogen are required to comply with the statutory requirements of 8 CCR 5189 and 29 CFR 1910.119, Process Safety Management of Highly Hazardous Chemicals (specifically, in accordance with 1910.119 (a) (1) (ii), a process that involves a flammable liquid or gas on site in one location in a quantity of 10,000 pounds or more). Because the Modified Project's centralized system would store a maximum of 2,760 pounds of hydrogen, the RMP regulations would not apply should the centralized system be implemented; the distributed system would exceed the 10,000 pound threshold.

The Commission Decision identified the following permits required for the Project: a Hazardous Materials Business Plan, Spill Prevention, Control and Countermeasures Plan, and, possibly, a RMP for the hydrogen system the Project would use.

4.15.5 Changes in Proposed Mitigation

No new or more severe impacts requiring additional mitigation would result from the Modified Project. The mitigation measures proposed in the Commission Decision would mitigate impacts associated with the Modified Project to levels that would be less than significant.

4.15.6 Changes in Conditions of Certification

The conforming changes to the Conditions for the Modified Project related to hazardous materials management are:

HAZ-1 The project owner shall not use any hazardous materials not listed in **Appendix A,** below, or in greater quantities than those identified by chemical name in **Appendix A,** unless approved in advance by the Compliance Project Manager (CPM). Appendix A may be amended at any time with CPM approval.

Verification: The project owner shall provide to the CPM in the Annual Compliance Report, a list of hazardous materials contained at the facility.

HAZ-2 ~~The~~If required under applicable LORS, the project owner shall concurrently provide a Hazardous Materials Business Plan (HMBP), a Risk Management Plan (RMP) that includes the consequences of a train

derailment resulting in a hydrogen pipeline leak and fire, and a Spill Prevention, Control, and Countermeasure Plan (SPCC) to the San Bernardino County Fire Department, and the CPM for review. After receiving comments from the San Bernardino County Fire Department, and the CPM, the project owner shall reflect all received recommendations in the final documents. If no comments are received from the county within 30 days of submittal, the project owner may proceed with preparation of final documents upon receiving comments from the CPM. Copies of the final HMBP, RMP, and SPCC Plan shall then be provided to the San Bernardino County Fire Department for their records and to the CPM for approval.

Verification: At least 60 days prior to receiving any hazardous material on the site for commissioning or operations, the project owner shall provide a copy of a final Hazardous Materials Business Plan (HMBP) and a Spill Prevention, Control, and Countermeasure Plan (SPCC) to the CPM for approval, as required. At least 60 days prior to existence of any hydrogen on the site for commissioning or operations, the project owner shall provide a copy of a final Risk Management Plan (RMP) to the CPM for approval, as required.

HAZ-3 The project owner shall develop and implement a Safety Management Plan for delivery of liquid and gaseous hazardous materials. The plan shall include procedures, protective equipment requirements, training and a checklist. It shall also include a section describing all measures to be implemented to prevent mixing of incompatible hazardous materials. This plan shall be applicable during construction, commissioning, and operation of the power plant.

Verification: At least 60 days prior to the delivery of any liquid or gaseous hazardous material to the facility, the project owner shall provide a Safety Management Plan as described above to the CPM for review and approval.

HAZ-4 ~~At least 30 days prior to commencing construction, a~~A site-specific Construction Site Security Plan for the construction phase shall be prepared and made available to BLM's authorized officer and the CPM for review and approval. The Construction Security Plan shall include the following:

Perimeter security consisting of fencing enclosing the construction area;

Security guards;

Site access control consisting of a check-in procedure or tag system for construction personnel and visitors;

Written standard procedures for employees, contractors and vendors when encountering suspicious objects or packages on-site or off-site;

Protocol for contacting law enforcement and the CPM in the event of suspicious activity or emergency; and

Evacuation procedures.

Verification: At least 30 days prior to ~~commencing construction~~start of Pre-Construction Site Mobilization, the project owner shall notify the CPM that a site-specific Construction Security Plan is available for review and approval.

HAZ-5 The project owner shall prepare a site-specific Security Plan for the operational phase and shall be made available to the CPM for review and approval. The project owner shall implement site security measures addressing physical site security and hazardous materials storage. The level of security to be implemented shall not be less than that described below (as per NERC 2002).

The Operation Security Plan shall include the following:

Permanent full perimeter fence, at least 8 feet high around the Solar Field;

Main entrance security gate, either hand operable or motorized;

Evacuation procedures;

Protocol for contacting law enforcement and the CPM in the event of suspicious activity or emergency;

Written standard procedures for employees, contractors and vendors when encountering suspicious objects or packages on-site or off-site;

If an RMP is required under HAZ-2,

a. ~~A~~a statement (refer to sample, attachment "A") signed by the project owner certifying that background investigations have been conducted on all operational project personnel hired by project owner. Background investigations shall be restricted to ascertain the accuracy of employee identity and employment history, and shall be conducted in accordance with state and federal law regarding security and privacy;

b. ~~A~~a statement(s) (refer to sample, attachment "B") signed by the contractor or authorized representative(s) for any permanent contractors or other technical contractors (as determined by the CPM after consultation with the project owner) that are present at any time on the site to repair, maintain, investigate, or conduct any other technical duties involving critical components (as determined by the CPM after consultation with the project owner) certifying that background investigations have been conducted on contractor personnel that visit the project site.

~~6.~~ Site access controls for employees, contractors, vendors, and visitors;

~~7.~~ Closed circuit TV (CCTV) monitoring system, recordable, and viewable in the power plant control room and security station (if separate from the control room) with cameras able to pan, tilt, and zoom, have low-light capability, and are able to view the outside entrance to the control room, the~~ two~~ hydrogen generator ~~slocations~~location, the front gate and emergency access gate(s), and all security fence that directly abuts the public access road; and

9. Additional measures to ensure adequate perimeter security consisting of either:

Security guard present 24 hours per day, 7 days per week, **OR**

Power plant personnel on-site 24 hours per day, 7 days per week and **one** of the following:

Perimeter breach detectors; **or** CCTV able to view both site entrance gates and 100 percent of the power block area perimeter

The project owner shall fully implement the security plans and obtain CPM approval of any substantive modifications to the security plans. The CPM may authorize modifications to these measures, or may require additional measures, such as protective barriers for critical power plant components or cyber security depending on circumstances unique to the facility or in response to industry-related standards, security concerns, or additional guidance provided by the U.S. Department of Homeland Security, the U.S. Department of Energy, or the North American Electrical Reliability Council, after consultation with appropriate law enforcement agencies and the ~~applicant~~project owner.

Verification: At least 30 days prior to the initial receipt of hazardous materials on-site, the project owner shall notify the CPM that a site-specific Operations Site Security Plan is available for review and approval. In the Annual Compliance Report, the project owner shall include a statement that all current project employee and appropriate contractor background investigations have been performed, and updated certification statements are appended to the Operations Security Plan. In the Annual Compliance Report, the project owner shall include a statement that the Operations Security Plan includes all current hazardous materials transport vendor certifications for security plans and employee background investigations.

HAZ-6 The holder (project owner) shall comply with all applicable Federal laws and regulations existing or hereafter enacted or promulgated. In any event, the holder(s) shall comply with the Toxic Substances Control Act of 1976, as amended (15 U.S.C. 2601, et seq.) with regard to any toxic substances that are used, generated by or stored on the right-of-way or on facilities authorized under this right-of-way grant. (See 40 CFR, Part 702-799 and especially, provisions on polychlorinated biphenyls, 40 CFR 761.1-761.193.)

Additionally, any release of toxic substances (leaks, spills, etc.) in excess of the reportable quantity established by 40 CFR, Part 117 shall be reported as required by the Comprehensive Environmental Response, Compensation and Liability Act of 1980, Section 1 02b

Verification: A copy of any report required or requested by any Federal agency or State government as a result of a reportable release or spill of any toxic substances shall be furnished to the CPM concurrent with the filing of the reports to the involved Federal agency or State government.

HAZ-7 The project owner shall ensure that whichever of the two proposed hydrogen storage and handling systems is used in the project, the system is reviewed, evaluated by a Mechanical Engineer registered in California to ensure that it complies with all applicable ANSI, ASME, and NFPA design codes, and that the system is approved by this person as shown by applying a professional "stamp" to the document review page. No hydrogen will be transported over or under the BNSF mainline or through the BNSF right-of-way.

Verification: At least 30 days prior to the existence of stored hydrogen on site, the project owner shall provide to the CPM for review and approval a copy of design drawings, documentation, and specifications of the hydrogen storage and handling system that has been reviewed, evaluated, approved, and stamped by a Mechanical Engineer registered in the state of California.

HAZ-8 ~~The~~If required under applicable LORS, the project owner shall:

Conduct a process hazard analysis and prepare a Process Safety Management Plan (PSM Plan) that contains a hazard analysis, including for rail operations using a Hazard and Operability Study (HAZOP) for the hydrogen system.

Retain an independent outside third party group of professionals to provide peer review and approval of the process hazard analysis and the PSM plan before they are submitted to the CPM. The outside third party shall have expertise in engineering and process operations, shall include at least one member who has experience and knowledge specific to the processes being evaluated, and shall also include one member knowledgeable in the specific process hazard analysis methodologies being used.

Ensure that the hydrogen compressor stations, piping connecting compressor stations and the piping between compressor stations and the hydrogen generator are at least 500 feet from the BNSF right-of-way.

Include in the hydrogen handling an automatic system for notification of BNSF operations of any loss of containment from the hydrogen system.

The final report containing the results of the hazard analysis, the final PSM Plan, and the review and approval of the outside third party shall be submitted to the San Bernardino County Fire Department for review and to the CPM for approval.

Verification: At least 30 days prior to receiving hydrogen gas on the site, the project owner shall provide, as required, a copy of a final hazard analysis, the final PSM Plan, and the review and approval of the outside third party to the CPM for approval.

4.15.7 References Cited

No references other than those presented in the Approved Project's record were used in the preparation of this analysis.

4.16 PUBLIC HEALTH AND SAFETY

As described in detail below, impacts of the Modified Project on public health and safety are expected to be less than those of the Approved Project and will remain less than significant.

4.16.1 Summary of Project Changes Related to Public Health and Safety

The reduction in SunCatchers and addition of PV technology would result in changes to the construction and operation of the Modified Project as described in detail in Section 4.2, Air Quality.

4.16.2 Changes in Environmental Impacts

As with the Approved Project, construction of the Modified Project would not affect public health and safety. As previously stated in the Commission Decision, the short-term duration of construction activities is not adequate to evaluate chronic (long-term) health effects. Assessment of such effects typically assumes continuous exposure to toxic substances over a period of from 8 to 70 years. In its decision, the Commission stated that they "did not conduct a quantitative assessment of construction impacts on public health given the distance from the site to the sparsely populated area surrounding the site and based on the Commission's prior experience using quantitative risk assessment tools showing that construction vehicle emissions impacts are generally less than significant." (Commission Decision, Public Health p. 4). As the bases for the Commission's Decision apply equally to the Modified Project, it is expected that construction impacts on public health would remain less than significant under the Modified Project.

During operation of the Modified Project, the diesel-fueled emergency generator would be the only stationary source that would emit Toxic Air Contaminants (TACs). Its expected usage has not changed under the Modified Project. The fire water pump would remain electric and all operations and maintenance vehicles would remain either electric or gasoline-powered.

Criteria pollutant emissions from operation activities under the Modified Project were estimated and are presented in Section 4.2, Air Quality. These emissions are less than the Approved Project's emissions. Since the Modified Project's operations and maintenance vehicle fleet mix would be smaller than under the Approved Project, TAC emissions are expected to decrease. The Modified Project would not result in additional TAC emissions, thus no new or more severe impacts to public health and safety would result from the Modified Project.

4.16.3 Changes in Cumulative Environmental Impacts

The Commission Decision concluded that the Approved Project would not result in any significant cumulative impacts to public health and safety. Incremental impacts of the Modified Project on Public Health and Safety are expected to be the same or slightly reduced compared to the Approved Project. As described in Section 4.23, Cumulative Scenario, no new reasonably foreseeable future actions beyond those assumed in the Commission Decision have been identified. Therefore, no increase in cumulative impacts under the Modified Project is anticipated.

4.16.4 Changes in LORS Conformance and Other Permits

In the Commission Decision, the Commission concluded that, with the implementation of the Conditions, the Approved Project would comply with all applicable LORS. As with the Approved Project, the Modified Project would comply with all applicable LORS, and no new or additional LORS have been identified.

4.16.5 Changes in Proposed Mitigation

No new or more severe impacts requiring additional mitigation would result from the Modified Project. The mitigation measures proposed in the Commission Decision would mitigate impacts associated with the Modified Project to levels that would be less than significant.

4.16.6 Changes in Conditions of Certification

The Commission Decision did not contain Conditions for public health and safety. Many of the Conditions proposed to mitigate impacts to air quality would also mitigate impacts to public health and safety. As no additional mitigation would be required, the Modified Project would not result in new Conditions.

4.16.7 References Cited

No references other than those presented in the Approved Project's record were used in the preparation of this analysis.

4.17 WORKER SAFETY AND FIRE PROTECTION

As described in detail below, impacts of the Modified Project on worker safety and fire protection are expected to be less than those of the Approved Project and will remain less than significant.

4.17.1 Summary of Project Changes Related to Worker Safety and Fire Protection

The Modified Project proposes to utilize single-axis tracking PV modules for the majority of the Project's electrical generation, and fewer SunCatchers. The reduction in SunCatchers would have a commensurate reduction in hydrogen production and storage, the main consideration regarding the Approved Project's potential impacts to worker safety and fire protection. The only SunCatcher hydrogen generation system in the Modified Project would be located north of the railroad within the SunCatcher area. No hydrogen would be generated or stored south of the railroad where the main services complex, and most employees, is located. Other than the reduction of hydrogen generation and storage, there have been no project changes that would affect worker safety and fire protection.

4.17.2 Changes in Environmental Impacts

As described in Section 4.15, Hazardous Material Management, the amount of hydrogen produced and stored on-site has been significantly reduced for the Modified Project. Therefore, the Modified Project's impacts to worker safety and fire protection would be less than or equal to those of the Approved Project.

4.17.3 Changes in Cumulative Environmental Impacts

The Commission Decision concluded that the Approved Project would not result in any significant cumulative impacts to worker health and safety. Incremental impacts of the Modified Project on worker health and safety are expected to be the same or slightly reduced compared to the Approved Project. As described in Section 4.23, Cumulative Scenario, no new reasonably foreseeable future actions beyond those assumed in the Commission Decision have been identified. Therefore, no increase in cumulative impacts under the Modified Project is anticipated.

4.17.4 Changes in LORS Conformance and Other Permits

In the Commission Decision, the Commission concluded that, with the implementation of the Conditions, the Approved Project would comply with all applicable LORS. As with the Approved Project, the Modified Project would comply with all applicable LORS, and no new or additional LORS have been identified.

4.17.5 Changes in Proposed Mitigation

No new or more severe impacts requiring additional mitigation would result from the Modified Project. The mitigation measures proposed in the Commission Decision would mitigate impacts associated with the Modified Project to levels that would be less than significant.

4.17.6 Changes in Conditions of Certification

The conforming changes to the Conditions for the Modified Project related to worker health and safety are:

WORKER SAFETY-1 The project owner shall submit to the Compliance Project Manager (CPM) a copy of the Project Construction Safety and Health Program containing the following:

A Construction Personal Protective Equipment Program;

A Construction Exposure Monitoring Program;

A Construction Injury and Illness Prevention Program;

A Construction heat stress protection plan that implements and expands on existing Cal OSHA regulations as found in 8 CCR 3395;

A Construction Emergency Action Plan; and

A Construction Fire Prevention Plan.

The Personal Protective Equipment Program, the Exposure Monitoring, the Personal Protective Equipment Program, the Exposure Monitoring Program, the Heat Stress Protection Plan, and the Injury and Illness Prevention Program shall be submitted to the CPM for review and approval of compliance of the program with all applicable safety orders. These plans shall include programs to prevent exposure of workers to the unusual hazard of high intensity reflected light from the solar parabolic mirrors. The Construction Emergency Action Plan and the Fire Prevention Plan shall be submitted to the San Bernardino County Fire Department for review and comment prior to submittal to the CPM for approval.

Verification: At least 30 days prior to the start of ~~construction~~Pre-Construction Site Mobilization, the project owner shall submit to the CPM for review and approval a copy of the Project Construction Safety and Health Program. The project owner shall provide a copy of a letter to the CPM from the San Bernardino County Fire Department with the fire department's comments on the Construction Fire Prevention Plan and Emergency Action Plan.

WORKER SAFETY-2 The project owner shall submit to the CPM a copy of the Project Operations and Maintenance Safety and Health Program containing the following:

An Operation Injury and Illness Prevention Plan;

An Operation heat stress protection plan that implements and expands on existing Cal OSHA regulations (8 CCR 3395);

A Best Management Practices (BMP) for the storage and application of herbicides;

An Emergency Action Plan;

Hazardous Materials Management Program;

Fire Prevention Program (8 CCR § 3221); and;

Personal Protective Equipment Program (8 CCR §§ 3401- 3411).

The Operation Injury and Illness Prevention Plan, Emergency Action Plan, the Heat Stress Protection Plan, BMP for Herbicides, and Personal Protective Equipment Program shall be submitted to the CPM for review and approval concerning compliance of the programs with all applicable safety orders. These plans shall include programs to prevent exposure of workers to the unusual hazard of high intensity reflected light from the solar parabolic mirrors. The Fire Prevention Plan and the Emergency Action Plan shall address special precautions and responses to implement when a fire involves a SunCatcher or hydrogen piping located within 200 feet of a fence line where a public access road exists directly on the other side of the fence. The Fire Prevention Plan and Emergency Action Plan shall also be submitted to the San Bernardino County Fire Department and the BNSF railroad for review and comment.

Verification: At least 30 days prior to the start of ~~operations~~commercial operation, the project owner shall submit to the CPM for approval a copy of the Project Operations and Maintenance Safety and Health Program.

WORKER SAFETY-3 The project owner shall provide a site Construction Safety Supervisor (CSS) who, by way of training and/or experience, is knowledgeable of power plant construction activities and relevant laws, ordinances, regulations, and standards, is capable of identifying workplace hazards relating to the construction activities, and has authority to take appropriate action to assure compliance and mitigate hazards. The CSS shall:

Have overall authority for coordination and implementation of all occupational safety and health practices, policies, and programs;

Assure that the safety program for the project complies with Cal/OSHA and federal regulations related to power plant projects;

Assure that all construction and commissioning workers and supervisors receive adequate safety training;

Complete accident and safety-related incident investigations, emergency response reports for injuries, and inform the CPM of safety-related incidents; and

Assure that all the plans identified in **Worker Safety-1** and **2** are implemented.

Verification: At least 30 days prior to the start of ~~site mobilization~~Pre-Construction Site Mobilization, the project owner shall submit to the CPM the name and contact information for the CSS. The contact information of any replacement CSS shall be submitted to the CPM within one business day.

The CSS shall submit in the Annual Compliance Report documentation of monthly safety inspection reports to include:

Record of all employees trained for that month (all records shall be kept on site for the duration of the project);

Summary report of safety management actions and safety-related incidents that occurred during the month;

Report of any continuing or unresolved situations and incidents that may pose danger to life or health; and

Report of accidents and injuries that occurred during the month.

WORKER SAFETY-4 The project owner shall make payments to the Chief Building Official (CBO) for the services of a Safety Monitor based upon a reasonable fee schedule to be negotiated between the project owner and the CBO. Those services shall be in addition to other work performed by the CBO. The Safety Monitor shall be selected by and report directly to the CBO, and will be responsible for verifying that the Construction Safety Supervisor, as required in **Worker Safety-3,** implements all appropriate Cal/OSHA and Commission safety requirements. The Safety Monitor shall conduct on-site (including linear facilities) safety inspections at intervals necessary to fulfill those responsibilities.

Verification: At least 30 days prior to the start of ~~construction~~Pre-Construction Site Mobilization, the project owner shall provide proof of its agreement to fund the Safety Monitor services to the CPM for review and approval.

WORKER SAFETY-5 The project owner shall ensure that two or more portable automatic external defibrillators (AEDs) are located on site during construction and operations and shall implement a program to ensure that workers are properly trained in its use and that the equipment is properly maintained and functioning at all times. During construction and commissioning, the following persons shall be trained in its use and shall be on-site whenever the workers that they supervise are on-site: the Construction Project Manager or delegate, the Construction Safety Supervisor or delegate, and all shift foremen. During operations, all power plant employees shall be trained in its

use. The training program shall be submitted to BLM's authorized officer and the CPM for review and approval.

Verification: At least 30 days prior to the start of ~~site mobilization~~Pre-Construction Site Mobilization the project owner shall submit to BLM's authorized officer and the CPM proof that a portable AED exists on site and a copy of the training and maintenance program for review and approval.

WORKER SAFETY-6 ~~Prior to the start of site mobilization for Phase 1 b, the~~The project owner shall:

Provide secondary access gates for emergency personnel to enter the southern and northern portions of the site. These secondary access gates shall be at least one-quarter mile from the primary access points and may be restricted to emergency response personnel.

Provide a second access road or roads that serve both the northern portion of the site and the southern portion of the site. This road(s) shall be treated with Soiltac or its equivalent with 80 percent compaction, at least 20 feet wide. The secondary emergency access road may cross the BNSF tracks at an at-grade crossing.

Maintain the main access road and the secondary access roads and provide a plan for implementation.

Provide funding for a gate (with a lock allowing emergency response access), posting to direct emergency responders to notify BNSF operations before crossing, telephone box to allow BNSF notification at the at-grade crossing of the BNSF rail line on the secondary access road, and any road improvements required by the San Bernardino County Fire Department.

e. Provide an at-grade crossing of the BNSF tracks between the southern and northern portions of the site and provide funding for a gate (with a lock allowing emergency response access), posting to direct emergency responders to notify BNSF, a telephone box to allow for notification to BNSF by emergency responders when using the secondary access road, and any road improvements near the crossing recommended by the SBCFD.

Plans for the secondary access gates, the method of gate operation, secondary emergency access road(s), the above-grade crossing, and to maintain the roads shall be submitted to the San Bernardino County Fire Department for review and comment and to the CPM for review and approval.

Verification: At least 30 days prior to the start of ~~site mobilization for Phase 1 b~~Pre-Construction Site Mobilization, the project owner shall submit to the San

Bernardino County Fire Department and the CPM preliminary plans showing the location and dimensions of the secondary access gates to both the southern and northern portions of the site, a description of how the gates will be opened by the fire department, and a description and map showing the location, dimensions, and composition of the main road, location of the secondary emergency access road(s) to the southern and northern portions of the site, and the engineering drawings and precise location of the above-grade crossing structure.

At least ~~30~~15 days prior to the start of ~~site mobilization~~Pre-Construction Site Mobilization, the project owner shall submit final plans plus the road maintenance plan to the CPM review and approval. The final plan submittal shall also include a letter containing comments from the San Bernardino County Fire Department or a statement that no comments were received.

WORKER SAFETY-7 The project owner shall either:

Reach an agreement with the San Bernardino County Fire Department (SBCFD) regarding funding of its project-related share of capital and operating costs to build and operate new fire protection/response infrastructure and provide appropriate equipment as mitigation of project-related impacts on fire protection services within the jurisdiction.

or

The project owner shall fund a Fire Needs Assessment and Risk Assessment conducted by an independent contractor who shall be selected and approved by the CEC Compliance Project Manager (CPM) and fulfill all mitigation identified in the independent fire needs assessment and a risk assessment. The Fire Needs Assessment must address emergency response and equipment, staffing, and location needs while the Risk Assessment must be used to establish the risk (chances) of significant impacts occurring.

Should the ~~Applicant~~Project owner pursue option (2), above, the Fire Needs Assessment and Risk Assessment shall evaluate the following:

The risk of impact on the local population that could result from potential unmitigated impacts on local fire protection and emergency services (i.e. “drawdown” of emergency response resources);

The extent that the project’s exemption from local taxes will impact local fire protection and emergency response services; and

Recommend an amount of funding that should be provided to mitigate any identified significant impacts on local fire protection and emergency response services.

Compliance Protocols for the Fire Needs Assessment and Risk Assessment shall be as follows:

The study shall be conducted by an independent consultant approved by the CPM. The project owner shall provide the CPM with the names of at least three consultants, whether entities or individuals, from which to make a selection, together with statements of qualifications. The CPM shall approve one of the three proffered consultants;

The Fire Needs Assessment and Risk Assessment shall be fully funded by the project owner. The independent consultant(s) preparing the Fire Needs Assessment and Risk Assessment shall work directly for the Energy Commission;

The project owner shall provide the protocols for conducting the independent fire needs assessment for review and comment by the SBCFD and review and approval by the CPM prior to the independent consultant's commencement of the fire needs assessment;

The CPM shall be copied in any correspondence including emails or letters and included in any conversations between the project owner and consultant; and

(e) The CPM shall verify that the Fire Needs Assessment and Risk Assessment are prepared consistent with the approved fire needs assessment protocols and a risk assessment protocols.

Plant operation shall not occur until funding of mitigation occurs either (i) pursuant to an agreement reached between the project owner and the SBCFD, or (ii) pursuant to the independent Fire Needs and Risk Assessments conducted by an independent consultant approved by the CPM or (iii) as determined by the Energy Commission or its designee if the project owner and SBCFD do not agree to the recommendations of the independent consultant's study. The Energy Commission or its designee shall, based on the results of the study and comments from the project owner and SBCFD, make the final determination regarding the funding to be provided to the SBCFD to accomplish the above-identified mitigation.

Verification: If Option 1 of Condition of Certification **WORKER SAFETY-7** is fulfilled prior to plant operation, then the project owner shall provide to the CPM a copy of the individual agreement with the SBCFD. If option 2 of Condition of Certification **WORKER SAFETY-7** is selected, then prior to plant operation the project owner shall provide to the CPM a protocol, scope and schedule of work for the independent Fire Needs Assessment and Risk Assessment and the qualifications of proposed contractor(s) for review and approval by the CPM; a copy of the completed Fire Needs Assessment and Risk Assessment showing the precise amount the project owner shall pay for mitigation; and documentation that the amount has been paid. If the Energy Commission or its designee establishes the payment amount, then prior to plant operation, the

project owner shall provide the CPM with a copy of the order or decision and documentation establishing that the amount has been paid.

Annually thereafter, the owner shall provide the CPM with verification of funding to the San Bernardino County Fire Department for required fire protection services mitigation pursuant to the agreement with the Fire Department or the CPM approved independent fire needs assessment.

WORKER SAFETY-8 In the event that the project owner has not satisfied the conditions set forth in **WORKER SAFETY-7** by the time the project owner, in consultation with the CPM, determines construction must commence, the project owner shall pay to SBCFD (a) $~~91,750~~$_____ (~~250~~(____ acres x $~~367~~____ per acre) prior to the start of construction for Phase 1~~ a; (b) $762,259 (2,077 acres x $367 per acre) prior to the start of construction for Phase 1 b; and (cc) $1,426,896 (3,888~~; and (cb) $_____ (_____ acres x $~~367~~____ per acre) prior to the start of construction for Phase 2. This funding shall off-set any initial funding required by **WORKER SAFETY-7** above until the funds are exhausted. This offset will be based on a full accounting by the SBCFD regarding the use of these funds.

Verification: At least 10 days prior to ~~the start of site mobilization~~Pre-Construction Site Mobilization for Phase1~~ a, 1 b~~ and Phase 2, respectively, the project owner shall provide to the CEC CPM either:

documentation that the payment described above has been made; **or**

that payment has been made pursuant to a contractual agreement with the SBCFD.

The CEC CPM shall adjust any payments initially required by **WORKER SAFETY-7** based upon the accounting provided by the SBCFD.

WORKER SAFETY-9 The project owner shall develop and implement an enhanced Dust Control Plan that includes the requirements described in **AQ-SC3** and additionally requires:

site worker use of dust masks (NIOSH N-95 or better) whenever visible dust is present;

implementation of methods equivalent to Rule 402 of the Kern County Air Pollution Control District (as amended Nov. 3, 2004); and

iii. implementation of enhanced dust control methods (increased frequency of watering, use of dust suppression chemicals, etc. consistent with **AQ-SC4** immediately whenever visible dust comes from or onto the site or when PM10 measurements obtained when implementing ii (above) exceed 50 $\mu g/m^3$.

Verification: At least 30 days prior to ~~the commencement of site mobilization~~Pre-Construction Site Mobilization, the enhanced Dust control Plan shall be provided to the CPM for review and approval.

4.17.7 References Cited

No references other than those presented in the Approved Project's record were used in the preparation of this analysis.

4.18 FACILITY DESIGN

The Commission Decision determined that the preliminary facility design of the Approved Project demonstrated that the Approved Project would comply with all applicable LORS (Commission Decision, Facility Design at 3). As is described in resource topic areas provided in Sections 4.2 - 4.17 of this Amendment, the Modified Project would also comply with all applicable LORS. As with the Approved Project, the Conditions, as modified in this Amendment, would ensure that the Modified Project is designed and constructed in accordance with applicable laws and in a manner that protects public health and safety.

4.18.1 Summary of Project Changes Related to Facility Design

The Commission evaluated detailed descriptions of the Project site, including soils, seismic conditions, and flood hazards, during the licensing of the Approved Project and, as noted above, determined that this information, together with the facility design information presented, demonstrated that the Approved Project would comply with all applicable LORs. The information regarding the conditions of the Project site considered by the Commission remains unchanged. For a significant portion of the Approved Project's major structures and equipment, the descriptions considered by the Commission in approving the Approved Project would also not change under the Modified Project.

While the facilities would be relocated under the Modified Project, the basic descriptions and design criteria would remain unchanged for the following facilities:

- SunCatchers;
- electrical system associated with the SunCatchers;
- hydrogen generating and distribution system associated with the SunCatcher;
- lighting systems, heating, ventilation, and air conditioning systems, and building construction;
- tank sizing and descriptions; and
- water supply and treatment equipment and facilities.

Under the Modified Project, the main change from the Approved Project would be the use of PV Tracker Blocks for 563 MW. The PV modules are described in the Project Description section and, as described in Section 4.2-4.17 of this Amendment, would be designed and constructed according to applicable industry standards and codes, as well as applicable LORS. A description and table summarizing the new electrical equipment needed for the PV modules is included in the Project Description section. This equipment would be manufactured and operated in conformance with applicable industry standards and codes. The PV Tracker Blocks would be installed in 2 MW blocks where all power generated at the block level would be delivered to inverter pads, which then would be stepped up and transferred to the on-site substation. All power entering the on-site substation would be collected and synchronized for transmission to the Pisgah substation. All intermediate power transmission and substation design features would conform to applicable industry standards and codes.

4.18.2 Consistency with LORS

The Commission Decision concluded that, with implementation of the Conditions, the Approved Project would comply with all applicable LORS. As with the Approved Project, the Modified Project would comply with all applicable LORS.

4.18.3 Conditions of Certification

The Commission Decision concluded that Conditions GEN-1 through GEN-8, CIVIL-1 through CIVIL 4, STRUC-2 through STRUC-4, MECH-1 through MECH-3 and ELEC-1 would ensure that the Approved Project is designed and constructed in accordance with applicable law and in a manner that protects public health. Implementation of these conditions, as modified below to conform with the Modified Project, would ensure that the Modified Project is similarly designed and constructed in accordance with applicable requirements and in a manner that protects public health and safety.

GEN-1 The project owner shall design, construct, and inspect the project in accordance with the 2007 California Building Standards Code (CBSC), also known as Title 24, California Code of Regulations, which encompasses the California Building Code (CBC), California Building Standards Administrative Code, California Electrical Code, California Mechanical Code, California Plumbing Code, California Energy Code, California Fire Code, California Code for Building Conservation, California Reference Standards Code, and all other applicable engineering LORS in effect at the time initial design plans are submitted to the CBO for review and approval (the CBSC in effect is the edition that has been adopted by the California Building Standards Commission and published at least 180 days previously). The project owner shall ensure that all the provisions of the above applicable codes are enforced during the construction, addition, alteration, moving, demolition, repair, or maintenance of the completed facility. All transmission facilities (lines, switchyards, switching stations and substations) are covered in the Conditions of Certification in the **Transmission System Engineering** section of this document.

In the event that the initial engineering designs are submitted to the CBO when the successor to the 2007 CBSC is in effect, the 2007 CBSC provisions shall be replaced with the applicable successor provisions. Where, in any specific case, different sections of the code specify different materials, methods of construction or other requirements, the most restrictive shall govern. Where there is a conflict between a general requirement and a specific requirement, the specific requirement shall govern.

The project owner shall ensure that all contracts with contractors, subcontractors, and suppliers clearly specify that all work performed and materials supplied comply with the codes listed above.

Verification: Within 30 days following receipt of the certificate of occupancy, the project owner shall submit to the CPM a statement of verification, signed by the responsible design engineer, attesting that all designs, construction, installation, and inspection requirements of the applicable LORS and the Energy Commission's decision have been met in the area of facility design. The project owner shall provide the CPM a copy of the certificate of occupancy within 30 days of receipt from the CBO.

Once the certificate of occupancy has been issued, the project owner shall inform the CPM at least 30 days prior to any construction, addition, alteration, moving, demolition, repair, or maintenance to be performed on any portion(s) of the completed facility that requires CBO approval for compliance with the above codes. The CPM will then determine if the CBO needs to approve the work.

GEN-2 Before submitting the initial engineering designs for CBO review, the project owner shall furnish the CPM and the CBO with a schedule of facility design submittals, and master drawing and master specifications lists. The schedule shall contain a list of proposed submittal packages of designs, calculations, and specifications for major structures and equipment. To facilitate audits by Energy Commission staff, the project owner shall provide specific packages to the CPM upon request.

Verification: At least 30 days (or a project owner- and CBO-approved alternative time frame) prior to the ~~start of rough grading,~~Pre-Construction Site Mobilization, the project owner shall submit to the CBO and to the CPM the schedule of the facility design submittals. At least 60 days prior to the start of any increment of construction of any major structures or equipment listed in **Facility Design Table 2**, the project owner shall submit to the CBO and to the CPM the ~~schedule, the~~ master drawing and master specifications lists of documents to be submitted to the CBO for review and approval for such increment. These documents shall be the pertinent design documents for the major structures and equipment listed in **Facility Design Table 2,** below. Major structures and equipment shall be added to or deleted from the table only with CPM approval. The project owner shall provide schedule updates in the monthly compliance report.

Facility Design Table 2
Major Structures and Equipment List

Equipment/System	Quantity (Plant)
SunCatcher Power Generating Unit (CT) Foundation and Connections	1 Lot
PV Tracker Blocks	1 Lot
2 MW Inverter Pads	1 Lot
Modules	1 Lot

Administration Building Structure, Foundation and Connections	1
Maintenance Building Structure, Foundation and Connections	1
Assembly Building Structure, Foundation and Connections	~~3~~2
Collector Group Generator Step-up Unit Transformer Foundation and	1 Lot
Generator Collection Power Center	1 Lot
Generator Collection Sub-panel	1 Lot
Power Factor Capacitor	1 Lot
Open Bus Switch Rack	6
Shunt Capacitor Bank	~~6~~1
Dynamic VAR Compression System	~~6~~1
Disconnect Switch	15
Power Transformer Foundation and Connections	6
Coupling Capacitor Voltage Transformer Foundation and Connections	6
Diesel Power Generator Set Foundation and Connections	1
Fire Water Pump Foundation and Connections	1
Water Treatment System Foundation and Connections	1
Potable/Fire Water Tank Structure, Foundation and Connections	1
Well Water Storage Tank Structure, Foundation and Connections	1
Demineralized Water Storage Tank Structure, Foundation and Connections	2
Hydrogen Bottles Storage Area	1 Lot
Chemical Storage Area	1 Lot
Drainage Systems (including sanitary drain and waste)	1 Lot
High Pressure and Large Diameter Piping and Pipe Racks	1 Lot
HVAC and Refrigeration Systems	1 Lot
Temperature Control and Ventilation Systems (including water and sewer	1 Lot
Building Energy Conservation Systems	1 Lot
Equipment/System	**Quantity (Plant)**
Substation, Switchboards, Transformers, Buses and Towers	1 Lot
Electrical Breakers, Cables/Duct Banks	1 Lot
Prefabricated Assemblies	1 Lot

GEN-3 The project owner shall make payments to the CBO for design review, plan checks, and construction inspections, based upon a reasonable fee schedule to be negotiated between the project owner and the CBO. These fees may be consistent with the fees listed in the 2007 CBC, adjusted for inflation and other appropriate adjustments; may be based on the value of the facilities reviewed; may be based on hourly rates; or may be otherwise agreed upon by the project owner and the CBO.

Verification: The project owner shall make the required payments to the CBO in accordance with the agreement between the project owner and the CBO. The project owner shall send a copy of the CBO's receipt of payment to the CPM in the next monthly compliance report indicating that applicable fees have been paid.

GEN-4 Prior to the start of rough grading, the project owner shall assign a California- registered architect, or a structural or civil engineer, as the resident engineer (RE) in charge of the project. All transmission facilities (lines, switchyards, switching stations, and substations) are addressed in the Conditions of Certification in the **Transmission System Engineering** section of this Decision.

The RE may delegate responsibility for portions of the project to other registered engineers. Registered mechanical and electrical engineers may be delegated responsibility for mechanical and electrical portions of the project, respectively. A project may be divided into parts, provided that each part is clearly defined as a distinct unit. Separate assignments of general responsibility may be made for each designated part.

The RE shall:

Monitor progress of construction work requiring CBO design review and inspection to ensure compliance with LORS;

Ensure that construction of all facilities subject to CBO design review and inspection conforms in every material respect to applicable LORS, these Conditions of Certification, approved plans, and specifications;

3. Prepare documents to initiate changes in approved drawings and specifications when either directed by the project owner or as required by the Conditions of the project; Be responsible for providing project inspectors and testing agencies with complete and up-to-date sets of stamped drawings, plans, specifications, and any other required documents;

Be responsible for the timely submittal of construction progress reports to the CBO from the project inspectors, the contractor, and other engineers who have been delegated responsibility for portions of the project; and

6. Be responsible for notifying the CBO of corrective action or the disposition of items noted on laboratory reports or other tests when they do not conform to approved plans and specifications.

The resident engineer (or his delegate) must be located at the project site, or be available at the project site within a reasonable period of time, during any hours in which construction takes place.

The RE shall have the authority to halt construction and to require changes or remedial work if the work does not meet requirements.

If the RE or the delegated engineers are reassigned or replaced, the project owner shall submit the name, qualifications and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer.

Verification: At least 30 days (or project owner- and CBO-approved alternative time frame) prior to the start of rough grading, the project owner shall submit to the CBO for review and approval, the resume and registration number of the RE and any other delegated engineers assigned to the project. The project owner shall notify the CPM of the CBO's approvals of the RE and other delegated engineer(s) within five days of the approval.

If the RE or the delegated engineer(s) is subsequently reassigned or replaced, the project owner has five days to submit the resume and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer within five days of the approval.

GEN-5 ~~Prior to the start of rough grading, the~~The project owner shall assign at least one of each of the following California registered engineers to the project: a civil engineer; a soils, geotechnical, or civil engineer experienced and knowledgeable in the practice of soils engineering; and an engineering geologist. Prior to the start of construction, the project owner shall assign at least one of each of the following California registered engineers to the project: a design engineer who is either a structural engineer or a civil engineer fully competent and proficient in the design of power plant structures and equipment supports; a mechanical engineer; and an electrical engineer. (California Business and Professions Code section 6704 et seq., and sections 6730, 6731 and 6736 require state registration to practice as a civil engineer or structural engineer in California). All transmission facilities (lines, switchyards, switching stations, and substations) are handled in the Conditions of Certification in the **Transmission System Engineering** section of this Decision.

The tasks performed by the civil, mechanical, electrical, or design engineers may be divided between two or more engineers, as long as each engineer is responsible for a particular segment of the project (for example, proposed earthwork, civil structures, power plant structures, equipment support). No segment of the project shall have more than

one responsible engineer. The transmission line may be the responsibility of a separate California registered electrical engineer.

The project owner shall submit, to the CBO for review and approval, the names, qualifications, and registration numbers of all responsible engineers assigned to the project.

If any one of the designated responsible engineers is subsequently reassigned or replaced, the project owner shall submit the name, qualifications and registration number of the newly assigned responsible engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer.

A. The civil engineer shall:

Review the foundation investigations, geotechnical, or soils reports prepared by the soils engineer, the geotechnical engineer, or by a civil engineer experienced and knowledgeable in the practice of soils engineering;

Design (or be responsible for the design of), stamp, and sign all plans, calculations, and specifications for proposed site work, civil works, and related facilities requiring design review and inspection by the CBO. At a minimum, these include: grading, site preparation, excavation, compaction, construction of secondary containment, foundations, erosion and sedimentation control structures, drainage facilities, underground utilities, culverts, site access roads and sanitary sewer systems; and

3. Provide consultation to the RE during the construction phase of the project and recommend changes in the design of the civil works facilities and changes to the construction procedures.

B. The soils engineer, geotechnical engineer, or civil engineer experienced and knowledgeable in the practice of soils engineering, shall:

1. Review all the engineering geology reports; Prepare the foundation investigations, geotechnical, or soils reports containing field exploration reports, laboratory tests, and engineering analysis detailing the nature and extent of the soils that could be susceptible to liquefaction, rapid settlement or collapse when saturated under load;

Be present, as required, during site grading and earthwork to provide consultation and monitor compliance with requirements set forth in the 2007 CBC (depending on the site conditions, this may be the responsibility of either the soils engineer, the engineering geologist, or both); and

4. Recommend field changes to the civil engineer and RE.

This engineer shall be authorized to halt earthwork and to require changes if site conditions are unsafe or do not conform to the predicted conditions used as the basis for design of earthwork or foundations.

C. The engineering geologist shall:

Review all the engineering geology reports and prepare a final soils grading report; and

Be present, as required, during site grading and earthwork to provide consultation and monitor compliance with the requirements set forth in the 2007 CBC (depending on the site conditions, this may be the responsibility of either the soils engineer, the engineering geologist, or both).

D. The design engineer shall:

Be directly responsible for the design of the proposed structures and equipment supports;

Provide consultation to the RE during design and construction of the project;

Monitor construction progress to ensure compliance with engineering LORS;

Evaluate and recommend necessary changes in design; and

5. Prepare and sign all major building plans, specifications, and calculations.

E. The mechanical engineer shall be responsible for, and sign and stamp a statement with, each mechanical submittal to the CBO, stating that the proposed final design plans, specifications, and calculations conform to all of the mechanical engineering design requirements set forth in the Energy Commission's Decision. F. The electrical engineer shall:

Be responsible for the electrical design of the project; and

Sign and stamp electrical design drawings, plans, specifications, and calculations.

Verification: At least 30 days (or project owner and CBO approved alternative time frame) prior to the start of rough grading, the project owner shall submit to the CBO for review and approval, resumes and registration numbers of the responsible civil engineer, soils (geotechnical) engineer and engineering geologist assigned to the project.

At least 30 days (or project owner- and CBO-approved alternative time frame) prior to the start of ~~construction~~rough grading, the project owner shall submit to the CBO for review and approval, resumes and registration numbers of the responsible design engineer, mechanical engineer, and electrical engineer assigned to the project.

The project owner shall notify the CPM of the CBO's approvals of the responsible engineers within five days of the approval.

If the designated responsible engineer is subsequently reassigned or replaced, the project owner has five days in which to submit the resume and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer within five days of the approval.

GEN-6 Prior to the start of an activity requiring special inspection, including prefabricated assemblies, the project owner shall assign to the project, qualified and certified special inspector(s) who shall be responsible for the special inspections required by the 2007 CBC. All transmission facilities (lines, switchyards, switching stations, and substations) are handled in Conditions of Certification in the **Transmission System Engineering** section of this Decision.

A certified weld inspector, certified by the American Welding Society (AWS), and/or American Society of Mechanical Engineers (ASME) as applicable, shall inspect welding performed on-site requiring special inspection (including structural, piping, tanks and pressure vessels).

The special inspector shall:

Be a qualified person who shall demonstrate competence, to the satisfaction of the CBO, for inspection of the particular type of construction requiring special or continuous inspection;

Inspect the work assigned for conformance with the approved design drawings and specifications; Furnish inspection reports to the CBO and RE. All discrepancies shall be brought to the immediate attention of the RE for correction, then, if uncorrected, to the CBO and the CPM for corrective action; and

Submit a final signed report to the RE, CBO, and CPM, stating whether the work requiring special inspection was, to the best of the inspector's knowledge, in conformance with the approved plans, specifications, and other provisions of the applicable edition of the CBC.

Verification: At least 15 days (or project owner- and CBO-approved alternative time frame) prior to the start of an activity requiring special inspection, the project owner shall submit to the CBO for review and approval, with a copy to the CPM, the name(s) and qualifications of the certified weld inspector(s), or other certified special inspector(s) assigned to the project to perform one or more of the duties set forth above. The project owner shall also submit to the CPM a copy of the CBO's approval of the qualifications of all special inspectors in the next monthly compliance report.

If the special inspector is subsequently reassigned or replaced, the project owner has five days in which to submit the name and qualifications of the newly assigned

special inspector to the CBO for approval. The project owner shall notify the CPM of the CBO's approval of the newly assigned inspector within 5 days of the approval.

GEN-7 If any discrepancy in design and/or construction is discovered in any engineering work that has undergone CBO design review and approval, the project owner shall document the discrepancy and recommend required corrective actions. The discrepancy documentation shall be submitted to the CBO for review and approval. The discrepancy documentation shall reference this Condition of Certification and, if appropriate, applicable sections of the CBC and/or other LORS.

Verification: The project owner shall transmit a copy of the CBO's approval of any corrective action taken to resolve a discrepancy to the CPM in the next monthly compliance report. If any corrective action is disapproved, the project owner shall advise the CPM, within five days, of the reason for disapproval and the revised corrective action to obtain CBO's approval.

GEN-8 The project owner shall obtain the CBO's final approval of all completed work that has undergone CBO design review and approval. The project owner shall request the CBO to inspect the completed structure and review the submitted documents. The project owner shall notify the CPM after obtaining the CBO's final approval. The project owner shall retain one set of approved engineering plans, specifications, and calculations (including all approved changes) at the project site or at another accessible location during the operating life of the project. Electronic copies of the approved plans, specifications, calculations, and marked-up as-builts shall be provided to the CBO for retention by the CPM.

Verification: Within 15 days of the completion of any work, the project owner shall submit to the CBO, with a copy to the CPM, in the next monthly compliance report, (a) a written notice that the completed work is ready for final inspection, and (b) a signed statement that the work conforms to the final approved plans. After storing the final approved engineering plans, specifications, and calculations described above, the project owner shall submit to the CPM a letter stating both that the above documents have been stored and the storage location of those documents.

Within 90 days of the completion of construction, the project owner shall provide to the CBO three sets of electronic copies of the above documents at the project owner's expense. These are to be provided in the form of "read only" (Adobe .pdf 6.0) files, with restricted (password-protected) printing privileges, on archive quality compact discs.

CIVIL-1 The project owner shall submit to the CBO for review and approval the following:

Design of the proposed drainage structures and the grading plan;

An erosion and sedimentation control plan;

Related calculations and specifications, signed and stamped by the responsible civil engineer; and

Soils, geotechnical, or foundation investigations reports required by the 2007 CBC.

Verification: At least 15 days (or project owner- and CBO-approved alternative time frame) prior to the start of ~~site~~rough grading the project owner shall submit the documents described above to the CBO for design review and approval. In the next monthly compliance report following the CBO's approval, the project owner shall submit a written statement certifying that the documents have been approved by the CBO.

CIVIL-2 The resident engineer shall, if appropriate, stop all earthwork and construction in the affected areas when the responsible soils engineer, geotechnical engineer, or the civil engineer experienced and knowledgeable in the practice of soils engineering identifies unforeseen adverse soil or geologic conditions. The project owner shall submit modified plans, specifications, and calculations to the CBO based on these new conditions. The project owner shall obtain approval from the CBO before resuming earthwork and construction in the affected area.

Verification: The project owner shall notify the CPM within 24 hours, when earthwork and construction is stopped as a result of unforeseen adverse geologic/soil conditions. Within 24 hours of the CBO's approval to resume earthwork and construction in the affected areas, the project owner shall provide to the CPM a copy of the CBO's approval.

CIVIL-3 The project owner shall perform inspections in accordance with the 2007 CBC. All plant site-grading operations, for which a grading permit is required, shall be subject to inspection by the CBO.

If, in the course of inspection, it is discovered that the work is not being performed in accordance with the approved plans, the discrepancies shall be reported immediately to the resident engineer, the CBO, and the CPM. The project owner shall prepare a written report, with copies to the CBO and the CPM, detailing all discrepancies, non-compliance items, and the proposed corrective action.

Verification: Within five days of the discovery of any discrepancies, the resident engineer shall transmit to the CBO and the CPM a non-conformance report (NCR), and the proposed corrective action for review and approval. Within five days of resolution of the NCR, the project owner shall submit the details of the corrective action to the CBO and the CPM. A list of NCRs, for the reporting month, shall also be included in the following monthly compliance report.

CIVIL-4 After completion of finished grading and erosion and sedimentation control and drainage work, the project owner shall obtain the CBO's approval of the final grading plans (including final changes) for the erosion and sedimentation control work. The civil engineer shall state that the work within his/her area of responsibility was done in accordance with the final approved plans.

Verification: Within 30 days (or project owner- and CBO-approved alternative time frame) of the completion of the erosion and sediment control mitigation and drainage work, the project owner shall submit to the CBO, for review and approval, the final grading plans (including final changes) and the responsible civil engineer's signed statement that the installation of the facilities and all erosion control measures were completed in accordance with the final approved combined grading plans, and that the facilities are adequate for their intended purposes, along with a copy of the transmittal letter to the CPM. The project owner shall submit a copy of the CBO's approval to the CPM in the next monthly compliance report.

STRUC-1 Prior to the start of any increment of construction of any major structure or component listed in **Facility Design Table 2** of Condition of Certification **GEN-2,** above, the project owner shall submit to the CBO for design review and approval the proposed lateral force procedures for project structures and the applicable designs, plans and drawings for project structures. Proposed lateral force procedures, designs, plans and drawings shall be those for the following items (from **Table 2,** above):

Major project structures;

Major foundations, equipment supports, and anchorage; and

3. Large field-fabricated tanks.

Construction of any structure or component shall not begin until the CBO has approved the lateral force procedures to be employed in designing that structure or component.

The project owner shall:

Obtain approval from the CBO of lateral force procedures proposed for project structures;

Obtain approval from the CBO for the final design plans, specifications, calculations, soils reports, and applicable quality control procedures. If there are conflicting requirements, the more stringent shall govern (for example, highest loads, or lowest allowable stresses shall govern). All plans, calculations, and specifications for foundations that support structures shall be filed concurrently with the structure plans, calculations, and specifications;

Submit to the CBO the required number of copies of the structural plans, specifications, calculations, and other required documents of the designated major structures prior to the start of on-site fabrication and installation of each structure, equipment support, or foundation;

Ensure that the final plans, calculations, and specifications clearly reflect the inclusion of approved criteria, assumptions, and methods used to develop the design. The final designs, plans, calculations, and specifications shall be signed and stamped by the responsible design engineer; and

5. Submit to the CBO the responsible design engineer's signed statement that the final design plans conform to applicable LORS.

Verification: At least 60 days (or project owner and CBO approved alternative time frame) prior to the start of any increment of construction of any structure or component listed in **Facility Design Table 2** of Condition of Certification **GEN-2,** above, the project owner shall submit to the CBO the above final design plans

of such increment, specifications and calculations, with a copy of the transmittal letter to the CPM.

The project owner shall submit to the CPM, in the next monthly compliance report, a copy of a statement from the CBO that the proposed structural plans,

specifications, and calculations have been approved and comply with the requirements set forth in applicable engineering LORS.

STRUC-2 The project owner shall submit to the CBO the required number of sets of the following documents related to work that has undergone CBO design review and approval:

Concrete cylinder strength test reports (including date of testing, date sample taken, design concrete strength, tested cylinder strength, age of test, type and size of sample, location and quantity of concrete placement from which sample was taken, and mix design designation and parameters);

Concrete pour sign-off sheets;

Bolt torque inspection reports (including location of test, date, bolt size, and recorded torques);

Field weld inspection reports (including type of weld, location of weld, inspection of non-destructive testing (NDT) procedure and results, welder qualifications, certifications, qualified procedure description or number (ref: AWS); and

5. Reports covering other structural activities requiring special inspections shall be in accordance with the 2007 CBC.

Verification: If a discrepancy is discovered in any of the above data, the project owner shall, within 5 days, prepare and submit an NCR describing the nature of the discrepancies and the proposed corrective action to the CBO, with a copy of the transmittal letter to the CPM. The NCR shall reference the Condition(s) of Certification and the applicable CBC chapter and section. Within five days of resolution of the NCR, the project owner shall submit a copy of the corrective action to the CBO and the CPM.

The project owner shall transmit a copy of the CBO's approval or disapproval of the corrective action to the CPM within 15 days. If disapproved, the project owner shall advise the CPM, within five days, the reason for disapproval, and the revised corrective action to obtain CBO's approval.

STRUC-3 The project owner shall submit to the CBO design changes to the final plans required by the 2007 CBC, including the revised drawings, specifications,

calculations, and a complete description of, and supporting rationale for, the proposed changes, and shall give to the CBO prior notice of the intended filing.

Verification: On a schedule suitable to the CBO, the project owner shall notify the CBO of the intended filing of design changes, and shall submit the required number of sets of revised drawings and the required number of copies of the other above-mentioned documents to the CBO, with a copy of the transmittal letter to the CPM. The project owner shall notify the CPM, via the monthly compliance report, when the CBO has approved the revised plans.

STRUC-4 Tanks and vessels containing quantities of toxic or hazardous materials exceeding amounts specified in the 2007 CBC shall, at a minimum, be designed to comply with the requirements of that chapter.

Verification: At least 30 days (or project owner- and CBO-approved alternate time frame) prior to the start of installation of the tanks or vessels containing the above specified quantities of toxic or hazardous materials, the project owner shall submit to the CBO for design review and approval final design plans, specifications, and calculations, including a copy of the signed and stamped engineer's certification.

The project owner shall send copies of the CBO approvals of plan checks to the CPM in the following monthly compliance report. The project owner shall also transmit a copy of the CBO's inspection approvals to the CPM in the monthly compliance report following completion of any inspection.

MECH-1 The project owner shall submit, for CBO design review and approval, the proposed final design, specifications and calculations for each plant major piping and plumbing system listed in **Facility Design Table 2,** Condition of Certification **GEN-2,** above. Physical layout drawings and drawings not related to code compliance and life safety need not be submitted. The submittal shall also include the applicable QA/QC procedures. Upon completion of construction of any such major piping or plumbing system, the project owner shall request the CBO's inspection approval of that construction.

The responsible mechanical engineer shall stamp and sign all plans, drawings, and calculations for the major piping and plumbing systems, subject to CBO design review and approval, and submit a signed statement to the CBO when the proposed piping and plumbing systems have been designed, fabricated, and installed in accordance with all of the applicable laws, ordinances, regulations and industry standards, which may include, but are not limited to:

American National Standards Institute (ANSI) B31.1 (Power Piping Code);

ANSI B31 .2 (Fuel Gas Piping Code);

ANSI B31 .3 (Chemical Plant and Petroleum Refinery Piping Code);

ANSI B31 .8 (Gas Transmission and Distribution Piping Code);

Title 24, California Code of Regulations, Part 5 (California Plumbing Code); Title 24, California Code of Regulations, Part 6 (California Energy Code, for building energy conservation systems and temperature control and ventilation systems);

Title 24, California Code of Regulations, Part 2 (California Building Code); and

San Bernardino County codes.

The CBO may deputize inspectors to carry out the functions of the code enforcement agency.

Verification: At least 30 days (or project owner- and CBO-approved alternative time frame) prior to the start of any increment of major piping or plumbing construction listed in **Facility Design Table 2,** Condition of Certification **GEN-2,** above, the project owner shall submit to the CBO for design review and approval the final plans, specifications, and calculations of such increment, including a copy of the signed and stamped statement from the responsible mechanical engineer certifying compliance with applicable LORS, and shall send the CPM a copy of the transmittal letter in the next monthly compliance report.

The project owner shall transmit to the CPM, in the monthly compliance report following completion of any inspection, a copy of the transmittal letter conveying the CBO's inspection approvals.

MECH-2 For all pressure vessels installed in the plant, the project owner shall submit to the CBO and California Occupational Safety and Health Administration (Cal-OSHA), prior to operation, the code certification papers and other documents required by applicable LORS. Upon completion of the installation of any pressure vessel, the project owner shall request the appropriate CBO and/or Cal-OSHA inspection of that installation.

The project owner shall:

Ensure that all boilers and fired and unfired pressure vessels are designed, fabricated, and installed in accordance with the appropriate section of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, or other applicable code. Vendor certification, with identification of applicable code, shall be submitted for prefabricated vessels and tanks; and

Have the responsible design engineer submit a statement to the CBO that the proposed final design plans, specifications, and calculations conform to all of the requirements set forth in the appropriate ASME Boiler and Pressure Vessel Code or other applicable codes.

Verification: At least 30 days (or project owner- and CBO-approved alternative time frame) prior to the start of on-site fabrication or installation of any pressure vessel, the project owner shall submit to the CBO for design review and approval, the above listed documents, including a copy of the signed and stamped engineer's certification, with a copy of the transmittal letter to the CPM.

The project owner shall transmit to the CPM, in the monthly compliance report following completion of any inspection, a copy of the transmittal letter conveying the CBO's and/or Cal-OSHA inspection approvals.

MECH-3 The project owner shall submit to the CBO for design review and approval the design plans, specifications, calculations, and quality control procedures for any heating, ventilating, air conditioning (HVAC) or refrigeration system. Packaged HVAC systems, where used, shall be identified with the appropriate manufacturer's data sheets.

The project owner shall design and install all HVAC and refrigeration systems within buildings and related structures in accordance with the CBC and other applicable codes. Upon completion of any increment of construction, the project owner shall request the CBO's inspection and approval of that construction. The

final plans, specifications and calculations shall include approved criteria, assumptions, and methods used to develop the design. In addition, the responsible mechanical engineer shall sign and stamp all plans, drawings and calculations and submit a signed statement to the CBO that the proposed final design plans, specifications and calculations conform with the applicable LORS.

Verification: At least 30 days (or project owner- and CBO-approved alternative time frame) prior to the start of construction of any HVAC or refrigeration system, the project owner shall submit to the CBO the required HVAC and refrigeration calculations, plans, and specifications, including a copy of the signed and stamped statement from the responsible mechanical engineer certifying compliance with the CBC and other applicable codes, with a copy of the transmittal letter to the CPM.

ELEC-1 Prior to the start of any increment of electrical construction for all electrical equipment and systems 480 Volts or higher (see a representative list, below), with the exception of underground duct work and any physical layout drawings and drawings not related to code compliance and life safety, the project owner shall submit, for CBO design review and approval, the proposed final design, specifications, and calculations. Upon approval, the above listed plans, together with design changes and design change notices, shall remain on the site or at another accessible location for the operating life of the project. The project owner shall request that the CBO inspect the installation to ensure compliance with the requirements of applicable LORS. All transmission facilities (lines, switchyards, switching stations, and substations) are handled in Conditions of Certification in the **Transmission System Engineering** section of this Decision.

A. Final plant design plans shall include:

one-line diagrams for the 13.8-kV, 4.16-kV, 34.5-kV, 230-kV480 V and ~~480~~1000 V systems; and

system grounding drawings.

B. Final plant calculations must establish:

short-circuit ratings of plant equipment;

ampacity of feeder cables;

voltage drop in feeder cables;

system grounding requirements;

coordination study calculations for fuses, circuit breakers and protective relay settings for the 13.8-kV, 4.16-kV, 34.5-kV, 230-kV 480 V and ~~480~~1000 V systems;

system grounding requirements; and 7.

lighting energy calculations.

C. The following activities shall be reported to the CPM in the monthly compliance report:

Receipt or delay of major electrical equipment;

Testing or energization of major electrical equipment; and

3. A signed statement by the registered electrical engineer certifying that the proposed final design plans and specifications conform to requirements set forth in the Energy Commission decision.

Verification: At least 30 days (or project owner- and CBO-approved alternative time frame) prior to the start of each increment of electrical construction, the project owner shall submit to the CBO for design review and approval the above listed documents for such increment. The project owner shall include in this submittal a copy of the signed and stamped statement from the responsible electrical engineer attesting compliance with the applicable LORS, and shall send the CPM a copy of the transmittal letter in the next monthly compliance report.

4.18.4 References Cited

No references other than those presented in the Approved Project's record were used in the preparation of this analysis.

4.19 POWER PLANT EFFICIENCY

The Commission determined that:

- the Approved Project would not use fossil fuel to generate electricity;
- the Approved Project's fuel consumption would be negligible;
- the impact of the Approved Project's fuel consumption on energy supplies and energy efficiency would be insignificant; and
- the Approved Project would decrease reliance on fossil fuel and increase reliance on renewable energy (Commission Decision, page Efficiency 5).

The Modified Project would not alter these conclusions.

4.19.1 Engineering Baseline

The Approved Project would rely entirely on SunCatcher technology to generate electricity. The Modified Project would still use SunCatchers to generate 100.5 MW of power but would use PV modules to generate the remaining megawatts. As with SunCatchers, PV technology does not use any fossil fuels but rather solar energy to produce electricity.

One of the issues discussed during the licensing proceedings was the land use efficiency of the SunCatcher technology. The Commission Decision relied on the 850 MW 6,215-acre proposal to determine that the SunCatcher technology had a power-based land use efficiency of 0.14 MW/acre or 7.3 acres/MW assuming the generating capacity and acreage of the Approved Project (Commission Decision, page Efficiency 3 and 4). Based on this assumption, the Commission concluded that the energy-based efficiency would be approximately 296 megawatt hours (MWh)/acre-year. As shown in Table 4.19-1, the power-based land use efficiency under the 663.5 MW 4,613-acre Approved Project was calculated to be 0.14 MW/acre and the energy-based land use efficiency would be 311 MWh/acre-year, and the power-based land use efficiency under the Modified Project would be 0.14 MW/acre and the energy-based land use efficiency would be 368 MWh/acre-year.

Table 4-19.1
Estimated Solar Land Use Efficiency

	Approved Project (Calculation based on Project as Submitted)	Approved Project (Calculation based on Approved MW and Acreage)	SunCatcher Portion of Modified Project	PV Portion of Modified Project	Total Modified Project
Generating Capacity (MW net)	850	663.5	100.5	563.0	663.5
Annual Energy Production (MWh net)	1,840,000	1,435,200	217,454	1,479,564	1,697,078
Annual Fuel Consumption (MMBtu LHV)	0	0	0	0	0
Footprint (acres)	6,215	4,613	796	3,817	4,613
Land Use Efficiency (Power-Based) (MW/acres)	0.14	0.14	0.13	0.15	0.14
Land Use Efficiency (Energy-Based) (MWh/acre-year)	296	311	273	388	368

Acronyms:
LHV – Lower Heating Value (of Natural Gas)
MMBtu – Million of British Thermal Units
MW - Megawatts
MWh - Megawatt hours
PV - Photovoltaic

Under the Modified Project, the overall land-use efficiency based on power (i.e., MW) would be equal to the Approved Project, and, based on energy (i.e., MWh), the Modified Project would be more efficient than the Approved Project.

4.19.2 Consistency with LORS

As with the Approved Project, no LORS apply to the Modified Project.

4.19.3 Conditions of Certification

The Commission Decision did not establish any Conditions for the Approved Project. Because there would not be any additional impacts or mitigation, no Conditions would be required under the Modified Project.

4.19.4 References Cited

No references other than those presented in the Approved Project's record were used in the preparation of this analysis.

4.20 POWER PLANT RELIABILITY

The Commission made the determinations listed below for the Approved Project.

- No North American Electric Reliability Corporation (NERC)[7] statistics for solar power plants were available at that time.
- The technology that would be used by the Approved Project has certain potential reliability advantages compared to other generating technologies, including its modularity and the ability to maintain and repair individual units without materially affecting overall output, and certain disadvantages, including a relative lack of historical field data on commercial-scale installations.
- The Approved Project is anticipated to operate at an annual capacity factor of approximately 20 to 25 percent depending upon climate trends, atmospheric dust levels, and maintenance schedules.
- Implementation of quality assurance/quality control (QA/QC) programs during design, procurement, construction, and operation of the plant, as well as adequate maintenance and repair of the equipment and systems, would ensure that the Approved Project would be adequately reliable.
- Implementation of appropriate Conditions included in the Facility Design section of the Commission Decision would ensure implementation of the QA/QC programs and conformance with seismic design criteria.
- The Applicant would use water from a private well adjacent to the Project site to supply water for the Project. Evidence regarding the adequacy of the water supply consisted, in part, of additional information regarding the Lavic Groundwater Basin. This evidence, in combination with implementation of Condition SOIL&WATER-9, would ensure that the water supply would be adequate for the Project.
- The Project would meet or exceed reliability during seismic events, flooding and high winds.
- The Project would incorporate an appropriate redundancy of function for its equipment (Commission Decision, page Reliability 6).

The Commission concluded that the Approved Project "…would meet or exceed industry norms for reliability and would not degrade the overall reliability of the electrical system" (Commission Decision, page Reliability 7). Under the Modified Project, some of the SunCatchers on site would be replaced with PV modules, which have a similar reliability and a longer history than the SunCatcher. Consequently, the Modified Project would also meet or exceed industry norms and not degrade electricity system reliability.

4.20.1 Engineering Baseline

The primary responsibility for ensuring the reliability of California's electricity system falls to the CAISO. The Commission evaluates the reliability of a proposed power plant to ensure that it does not

[7] NERC reliability standards define the reliability requirements for planning and operating the North American bulk power system; they are developed using an industry-driven ANSI-accredited process.

degrade the reliability of the interconnected electricity system and "…exhibit a level of reliability similar to that of power plants of past decades" (Commission Decision, page Reliability 1). In its evaluation, the Commission considers both a power plant's "…actual ability to generate power when it is considered to be available and failures at startup and unplanned (or forced) outages." The Commission seeks to ensure that power plants "…are able to operate for extended periods without shutting down for maintenance of repairs" (Commission Decision, page Reliability 1).

In evaluating the reliability of the power plant associated with the Approved Project, the Commission assessed five factors: (1) adequacy in levels of equipment availability, (2) plant maintainability with scheduled maintenance outages, (3) fuel and water availability, (4) resistance to natural hazards, and (5) comparison with industry norms. A comparison of these factors under the Approved Project and the Modified Project is provided in Table 4.20-1.

Table 4.20-1
Comparison of Power Plant Reliability Factors under Approved and Modified Project

Factor	Approved Project (Commission Decision, page Efficiency 2-6)	Modified Project
Equipment Availability	Reliability determined through: • Use of appropriate QA/QC programs • Use of qualified suppliers • Use of independent testing contracts • Use of specific Conditions • Use of manufacturer's warranty obligations and fulfillment program	For both the SunCatcher and PV components, commitment to: • Use of appropriate QA/QC programs • Use of qualified suppliers • Use of independent testing contracts • Use of specific Conditions • Use of manufacturer's warranty obligations and fulfillment program
Plant Maintainability	Reliability determined through: • Use of redundant pieces of equipment • Positive trend in long-term availability factor at existing commercial facility • Use of Condition to report on SunCatcher reliability and maintenance data	For both the SunCatcher and PV components, commitment to: • Use of redundant pieces of equipment With respect to PV: • Long operating history with PV modules
Fuel and Water Availability	Reliability determined through: • No use of natural gas or fossil fuels • No water for power plant cooling • Use of Condition to monitor long-term trends in groundwater levels and storage	For both the SunCatcher and PV components, commitment to: • No use of natural gas or fossil fuels • No water for power plant cooling • Use of Condition to monitor long-term trends in groundwater levels and storage
Natural Hazards	Reliability determined through: • Commitment to Project design and construction using latest applicable seismic, wind, and other LORS • Compliance with Facility Design Conditions • Commitment to Project design and construction that would provide adequate levels of flood resistance	For both the SunCatcher and PV components, commitment to: • Project design and construction using latest applicable seismic, wind, and other LORS • Compliance with Facility Design Conditions • Commitment to Project design and construction that would provide adequate levels of flood resistance

Acronyms:
LORS = laws, ordinances, regulations and standards
PV = photovoltaic
QA/QC = quality assurance/quality control

The Commission also considered how the Approved Project would compare with industry reliability norms. Information collected on the Maricopa Plant that was submitted during the certification proceeding demonstrated that SunCatcher technology is able to achieve an overall availability factor of 96.1 percent. Based on this information, the Commission determined that the Approved Project would be likely to achieve NERC's typical availability factors of 94 to 98 percent. This conclusion also would apply to the SunCatcher portion of the Modified Project.

PV technology has achieved mainstream acceptance worldwide for power generation. Worldwide, installed PV capacity grew to almost 23 gigawatts in 2009, with the greatest expansion in Europe. Indications are that growth continued apace through 2010. PV technology has entered the main stream of power production technology (Figure 4.20-1).

With the worldwide expansion of PV module demand and production capacity, the industry has matured. A robust network of manufacturers, sub-component suppliers, financiers and end users has developed, with commensurate gains in product reliability. PV technology has demonstrated reliability in a variety of countries and a variety of applications, including utility and industrial service applications. The per-watt price of PV modules has fallen in the last few years, and forecasts show continued price reductions and rising demand (GlobalData 2011). An expanding universe of engineers, constructors, insurance companies and lenders are adept at developing and servicing solar projects, thus providing improved service and support for PV projects.

Commercial facilities of the size proposed for the Modified Project are still relatively new, and, as with the SunCatcher, limited long-term reliability data are available. Unlike conventional power plants, PV plants are not subject to single-point failure modes, such as failure of a steam turbine or boiler. If an individual module fails, the loss is only about 1/3 kW, which is a miniscule fraction of the total plant output. Similarly, if an inverter station fails, the loss is only 2 MW, which is only 1/3 percent of the total plant output. If a tracker motor or gearbox fails, the affected modules would continue to generate power in a fixed position, albeit at slightly reduced output.

Replacement of these items – modules, inverters, and tracker motor/gearboxes – is a simple operation that does not require heavy cranes or equipment. Spares of all these items would be stored in the facility warehouse. Modules weigh only about 55 pounds and require less than 10 bolts and 3 snap-type wire connectors. Inverters can be installed with a forklift. Tracker motors can be lifted into place manually.

In summary, the PV portion of the Modified Project would consist of large numbers of small, easily replaceable components. Availability and reliability is expected to match the performance of conventional power plants. Manufacturers of PV modules typically offer 12 year warranties against failure, and 25 year warranties on sustained performance. Based on a review of the factors considered for determining power plant reliability, the Modified Project would meet the same reliability considerations as the Approved Project.

4.20.2 Consistency with LORS

As with the Approved Project, no LORS apply to the Modified Project.

4.20.3 Conditions of Certification

In approving the Approved Project, the Commission established Condition REL-1 related to collecting and reporting data on the Maricopa Plant, the first commercial-scale power plant using the SunCatcher technology. The data included quarterly reliability and maintenance data, equipment failure logs and plant operating logs. Because the Modified Project is no longer owned by Tessera Solar, the owner and operator of Maricopa Solar, Calico Solar is not able to access the logs and detailed reliability and maintenance data.

~~**REL-1** From the time of the Energy Commission's adoption of this condition of certification to the start of commercial operation of the Calico Solar Project, or to the closure of the Maricopa Plant, whichever occurs earlier, the project owner shall obtain and provide to the CPM quarterly data sets of reliability and maintenance data from the Maricopa Plant, including the following:~~

~~a) logs of equipment failure data and operational data for all major equipment, including power conversion units, drive mechanisms, and controls. These logs shall include major equipment and plant availability factors, and major equipment and plant forced outage rates, including their causes and durations~~

~~b) plant operating logs showing dates and times of dispatch, and power level of dispatch~~

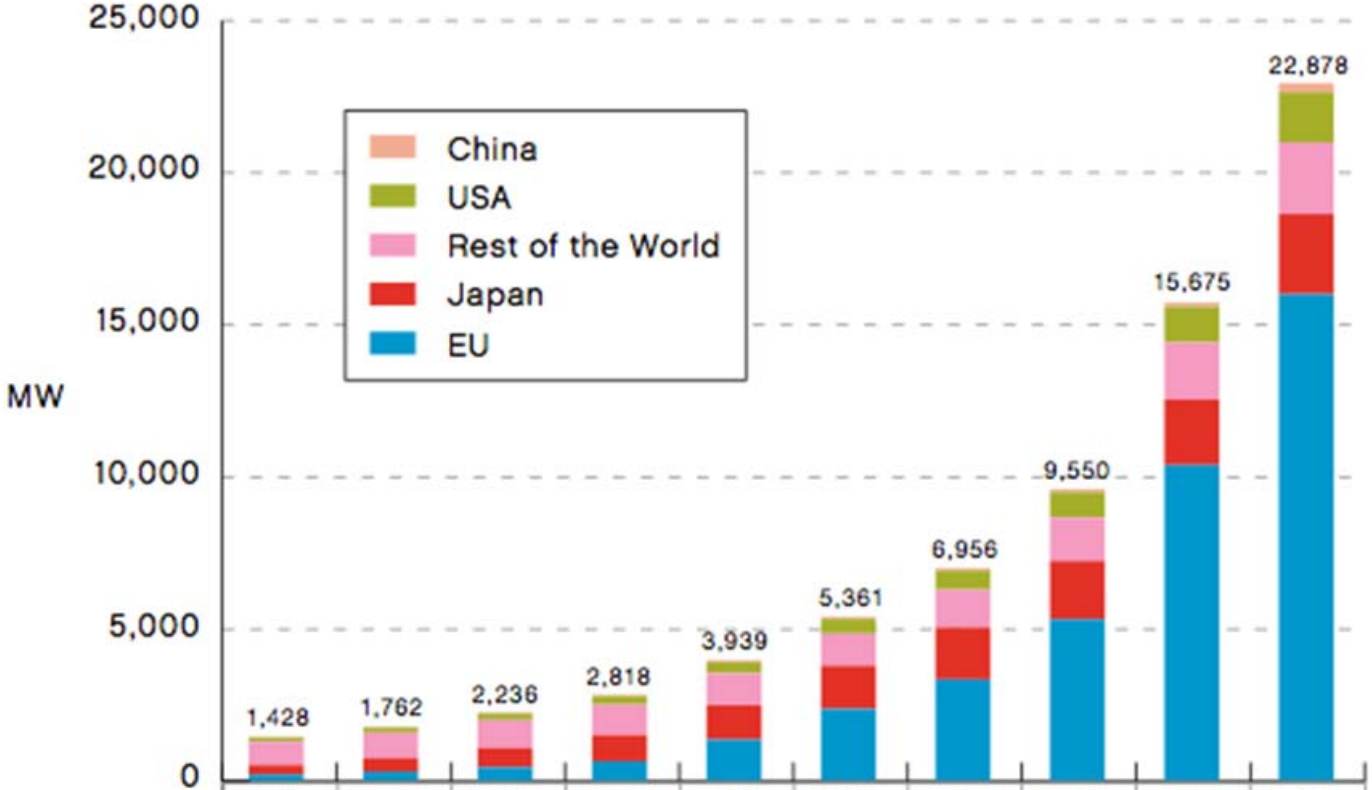
~~During the first two years of the commercial operation of the Calico Solar Project, the project owner shall maintain quarterly data sets of reliability and maintenance data, including the information specified in paragraphs a) and b) above, for the Calico Solar Project and make the information available to the CPM upon request.~~

~~**Verification:** On a quarterly basis, the project owner shall submit the Maricopa project data described in paragraphs a) and b) above, to the CPM, and shall make the Calico Solar Project data available to the CPM upon request.~~

4.20.4 References Cited

European Photovoltaic Industry Association.Global Outlook for Photovoltaics, May Update. 2010.

GlobalData..Renewable Energy Trade Imbalance – Will WTO Scanner Revive the Situation?, January 30. 2011



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
China	19	30	45	55	64	68	80	100	145	305
USA	139	168	212	275	365	479	624	831	1,173	1,650
ROW	763	825	913	1,000	1,044	1,051	1,235	1,422	1,870	2,347
Japan	318	452	637	860	1,132	1,422	1,708	1,919	2,149	2,633
EU	189	286	429	628	1,334	2,341	3,309	5,279	10,338	15,943
Total	1,428	1,762	2,236	2,818	3,939	5,361	6,956	9,550	15,675	22,878

Source: European Photovoltaic Industry Association, Global Outlook for Photovoltaics, May 2010 Update

HISTORICAL DEVELOPMENT OF WORLD CUMULATIVE PV POWER INSTALLED IN MAIN GEOGRAPHIES

URS

NO SCALE

CREATED BY: CL | DATE: 03-12-11

PM: AL | PROJ. NO: 27651022.01000

FIG. NO: 4.20-1

4.21 TRANSMISSION SYSTEM ENGINEERING

The CAISO is responsible for developing standards to achieve system reliability and ensuring overall reliability of the transmission system in the State. The CAISO has reviewed and issued a preliminary approval of the System Impact Study (SIS) and Facility Study for the Project, which was prepared by SCE. The conditions outlined in the System Impact Study and Facility Study would be unchanged under the Modified Project.

The Commission examined whether the Approved Project's transmission interconnection would conform to all applicable LORS required for safe and reliable electric power transmission. In its review, the Commission Decision concluded that:

- with implementation of the required facilities and the Conditions, the requirements and standards of all applicable engineering LORS would be met;
- the SIS demonstrated that the addition of the Project would cause new normal (N-0) and single contingency (N-1) overloads on the Lugo No. 1 & No. 2 500/230 kV transformer banks and the Lugo-Pisgah 230 kV lines during heavy summer peak and light spring conditions; however, with all pre-project upgrades and project-related upgrades, the base overloads were eliminated;
- the SIS also evaluated transient and post transient scenarios; the study concluded that the system remained stable with the implementation of pre-project and proposed project-related system upgrades; and
- the Project would meet the requirements and standards of all applicable LORS upon compliance with the recommended Conditions (Commission Decision, pages TSE 6 and 7, 2010).

Under the Modified Project, the location of the Project phases and generation technology mix would require a change to the location of the on-site substation, but would not change the size or nature of the interconnection with the existing transmission system at the Pisgah Substation or the reliability of the California's electricity system.

4.21.1 Engineering Baseline

In evaluating the Project during the certification proceeding, the Commission considered the proposed transmission interconnection facilities, the impacts on SCE's transmission system, and cumulative impacts on the transmission system considering other foreseeable generation projects (Commission Decision, pages TSE 1 to 5). Under the Modified Project, the description of the on-site electrical collection system would be changed from the description in the Commission Decision because of the differences between the SunCatcher and PV technologies. Those changes are discussed in the Project Description section of this Amendment.

The on-site substation under the Modified Project would remain substantially as described in the Commission Decision, except for its location. The substation would be relocated south of the railroad on the eastern side of the Project site. This change would provide several advantages including: (1) minimizing access issues for Phase 1, (2) reducing the length of the transmission line from the 2 miles

originally specified, to approximately 500 feet, and (3) reducing the number of transmission towers from 15 to no more than 3.

The expansion and eventual upgrading of the Pisgah Substation and upgrade of the Lugo to Pisgah transmission line would still be required to accommodate the Modified Project and other generation facilities proposed in the region. However, the Modified Project would not impact these activities.

As noted in the Commission Decision, SCE has prepared the SISs required to identify and evaluate impacts of the Approved Project on the transmission system. These studies include power flows, sensitivity analyses, short circuit studies, and transient and post-transient analyses for the 275 MW Phase 1 of the Project and the initially proposed 575 MW Phase 2. Based on the conclusions of these studies and conditions established, the Commission concluded that "…the outlet lines and termination of Phases 1 and 2 of the proposed Calico Solar Project are acceptable and would comply with all applicable LORS" (Commission Decision, page TSE 4). The Modified Project would not alter the interconnection, and SCE and CAISO have determined that a new SIS is not required as a result of this Amendment.

In terms of the impacts of the Project and other existing and foreseeable power plants proposed to interconnect to the SCE transmission system, the Commission concluded that "The existing transmission system in the Project area lacks additional capacity and would require upgrades for any projects not currently interconnected to the grid." The Commission also concluded that "The impacts identified in the SIS would be mitigated with the identified recommended measures and conditions of certification, which would minimize the Project's contribution to cumulative impacts" (Commission Decision, page TSE 5). The Modified Project also would not change this conclusion.

4.21.2 Consistency with LORS

In its Commission Decision, the Commission concluded that, with the implementation of the Conditions, the Approved Project would comply with all applicable LORS. As with the Approved Project, the Modified Project would comply with all applicable LORS, and no new or additional LORS have been identified.

4.21.3 Conditions of Certification

The conforming changes to the Conditions for the Modified Project related to Transmission System Engineering are:

TSE-1 The project owner shall furnish to the Compliance Project Manager (CPM) and to the Chief Building Official (CBO) a schedule of transmission facility design submittals, a Master Drawing List, a Master Specifications List, and a Major Equipment and Structure List. The schedule shall contain a description and list of proposed submittal packages for design, calculations, and specifications for major structures and equipment. To facilitate audits by Energy Commission staff, the project owner shall provide designated packages to the CPM when requested.

Verification: At least 60 days prior to the start of construction of transmission facilities (or a lesser number of days mutually agreed to by the project owner and the CBO), the project owner shall submit the schedule, a Master Drawing List, and a Master Specifications List to the CBO and to the CPM. The schedule shall contain a description and list of proposed submittal packages for design, calculations, and specifications for major structures and equipment (see a list of major equipment in **Transmission System Engineering Table 1,** Major Equipment List below). Additions and deletions shall be made to the table only with CPM and CBO approval. The project owner shall provide schedule updates in the Monthly Compliance Report.

Transmission System Engineering Table 1
Major Equipment List

Breakers	Take Off Facilities
Step-Up Transformer	Electrical Control Building
Switchyard	Switchyard Control Building
Busses	Transmission Pole/Tower
Surge Arrestors	Grounding System
Disconnects	

TSE-2 ~~Prior to the start of construction, the~~The project owner shall assign an electrical engineer and at least one of each of the following to the project: A) a civil engineer; B) a geotechnical engineer or a civil engineer experienced and knowledgeable in the practice of soils engineering; C) a design engineer who is either a structural engineer or a civil engineer fully competent and proficient in the design of power plant structures and equipment supports; or D) a mechanical engineer. (Business and Professions Code Sections 6704 et seq. require state registration to practice as a civil engineer or structural engineer in California.)

The tasks performed by the civil, mechanical, electrical, or design engineers may be divided between two or more engineers, as long as each engineer is responsible for a particular segment of the project (e.g., proposed earthwork, civil structures, power plant structures, equipment support). No segment of the project shall have more than one responsible engineer. The transmission line may be the responsibility of a separate California-registered electrical engineer. The civil, geotechnical or civil, and design engineer assigned in conformance with Facility Design Condition **GEN-5,** may be responsible for design and review of the TSE facilities.

The project owner shall submit to the CBO for review and approval, the names, qualifications, and registration numbers of all engineers assigned to the project. If any one of the designated engineers is subsequently reassigned or replaced, the project owner shall submit the name, qualifications, and

registration number of the newly assigned engineer to the CBO for review and approval.

The project owner shall notify the CPM of the CBO's approval of the new engineer. This engineer shall be authorized to halt earthwork and to require changes if site conditions are unsafe or do not conform to predicted conditions used as a basis for design of earthwork or foundations.

The electrical engineer shall:

Be responsible for the electrical design of the power plant switchyard, outlet and termination facilities; and

Sign and stamp electrical design drawings, plans, specifications, and calculations.

Verification: At least 30 days prior to the start of rough grading (or a lesser number of days mutually agreed to by the project owner and the CBO), the project owner shall submit to the CBO for review and approval, the names, qualifications, and registration numbers of all the responsible engineers assigned to the project. The project owner shall notify the CPM of the CBO's approvals of the engineers within five days of the approval.

If the designated responsible engineer is subsequently reassigned or replaced, the project owner shall have five days in which to submit the name, qualifications, and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer within five days of that approval.

TSE-3 If any discrepancy in design and/or construction is discovered in any engineering work that has previously undergone CBO design review and approval, the project owner shall document the discrepancy and recommend corrective action, (California Building Code, 1998, Chapter 1, Section 108.4, Approval Required; Chapter 17, Section 1701.3, Duties and Responsibilities of the Special Inspector; Appendix Chapter 33, Section 3317.7, Notification of Noncompliance). The discrepancy documentation shall become a controlled document and shall be submitted to the CBO for review and approval and shall reference this condition of certification.

Verification: The project owner shall submit a copy of the CBO's approval or disapproval of any corrective action taken to resolve a discrepancy to the CPM within 15 days of receipt. If disapproved, the project owner shall advise the CPM, within five days, the reason for disapproval, and the revised corrective action required obtaining the CBO's approval.

TSE-4 For the power plant switchyard, outlet line, and termination, the project owner shall not begin any increment of construction until plans for that increment have been approved by the CBO. These plans, together with design changes and design change notices, shall remain on the site for one year after completion of construction. The project owner
shall request that the CBO inspect the installation to ensure compliance with the requirements of applicable LORS. The following activities shall be reported in the Monthly Compliance Report:

Receipt or delay of major electrical equipment;

Testing or energization of major electrical equipment; and

The number of electrical drawings approved, submitted for approval, and still to be submitted.

Verification: At least 30 days prior to the start of each increment of construction (or a lesser number of days mutually agreed to by the project owner and the CBO), the project owner shall submit to the CBO for review and approval, for such increment, the final design plans, specifications, and calculations for equipment and systems of the power plant switchyard, outlet line, and termination, including a copy of the signed and stamped statement from the responsible electrical engineer attesting to compliance with the applicable LORS, and shall include a copy of the transmittal letter in the next Monthly Compliance Report.

TSE-5 The project owner shall ensure that the design, construction, and operation of the proposed transmission facilities conform to all applicable LORS, including the requirements listed below. The project owner shall submit the required number of copies of the design drawings and calculations as determined by the CBO.

The Calico Solar Project shall be interconnected to the SCE grid via a segment of 230kV, 1590 kcmil-ACSR, approximately 500 foot 2 mile long single circuit extending from the new substation on the project site to the Pisgah SCE Substation.

The Calico Solar Project substation on the project site shall use 34.5kV, 1200A, 25 breakers and six, three phase, 100/133/167.7 MVA, 34.5kV/230 kV transformers.

The power plant outlet line shall meet or exceed the electrical, mechanical, civil, and structural requirements of CPUC General Order 95 and General Order 98 or National Electric Safety Code (NESC), Title 8 of the California Code and Regulations (Title 8), Articles 35, 36, and 37 of the

"High Voltage Electric Safety Orders", California ISO standards, National Electric Code (NEC), and related industry standards.

Breakers and busses in the power plant switchyard and other switchyards, where applicable, shall be sized to comply with a short-circuit analysis.

Outlet line crossings and line parallels with transmission and distribution facilities shall be coordinated with the transmission line owner and comply with that owner's standards.

The project conductors shall be sized to accommodate the full output from the project.

7. Termination facilities shall comply with applicable SCE interconnection standards.

8. The generating facility shall provide sufficient reactive power resources on the project site as specified by the power factor design criteria requirements in Large Generator Interconnection Agreement.

Verification: At least 30 days prior to the start of construction of transmission facilities (or a lesser number of days mutually agreed to by the project owner and CBO), the project owner shall submit to the CBO for approval:

Design drawings, specifications, and calculations conforming with CPUC General Order 95 and General Order 98 or NESC; Title 8, California Code of Regulations, Articles 35, 36, and 37 of the "High Voltage Electric Safety Orders"; NEC; applicable interconnection standards, and related industry standards for the poles/towers, foundations, anchor bolts, conductors, grounding systems, and major switchyard equipment.

For each element of the transmission facilities identified above, the submittal package to the CBO shall contain the design criteria, a discussion of the calculation method(s), a sample calculation based on worst-case conditions,[1] and a statement signed and sealed by the registered engineer in responsible charge, or other acceptable alternative verification, that the transmission element(s) will conform with CPUC General Order 95 or NESC; Title 8, California Code of Regulations, Articles 35, 36 and 37 of the "High Voltage Electric Safety Orders"; NEC; applicable interconnection standards, and related industry standards.

3. Electrical one-line diagrams signed and sealed by the registered professional electrical engineer in responsible charge, a route map, and an engineering description of equipment and the configurations covered by requirements **TSE-1 through 5** above.

TSE-6 The project owner shall provide the following Notice to the California Independent System Operator (California ISO) prior to synchronizing the facility with the California transmission system:

At least one week prior to synchronizing the facility with the grid for testing, provide the California ISO a letter stating the proposed date of synchronization; and

At least one business day prior to synchronizing the facility with the grid for testing, provide telephone notification to the California ISO Outage Coordination Department.

Verification: The project owner shall provide copies of the California ISO letter to the CPM when it is sent to the California ISO one week prior to initial synchronization with the grid. A report of the conversation with the California ISO shall be provided electronically to the CPM one day before synchronizing the facility with the California transmission system for the first time.

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[1] Worst-case conditions for the foundations would include for instance, a dead-end or angle pole.

TSE-7 The project owner shall be responsible for the inspection of the transmission facilities during and after project construction, and any subsequent CPM and CBO approved changes thereto, to ensure conformance with CPUC GO-95 or NESC; Title 8, CCR, Articles 35, 36 and 37 of the "High Voltage Electric Safety Orders"; applicable interconnection standards; NEC; and related industry standards. In case of non-conformance, the project owner shall inform the CPM and CBO in writing, within 10 days of discovering such non-conformance and describe the corrective actions to be taken.

Verification: Within 60 days after first synchronization of the project, the project owner shall transmit to the CPM and CBO:

As-built engineering description(s) and one-line drawings of the electrical portion of the facilities signed and sealed by the registered electrical engineer in responsible charge. A statement attesting to conformance with CPUC GO-95 or NESC; Title 8, California Code of Regulations, Articles 35, 36 and 37 of the "High Voltage Electric Safety Orders"; applicable interconnection standards; NEC; and related industry standards, and these conditions shall be provided concurrently with the submittal of the as-built plans.

An as-built engineering description of the mechanical, structural, and civil portions of the transmission facilities signed and sealed by the registered engineer in responsible charge or acceptable alternative verification. As-built drawings of the electrical, mechanical, structural, and civil portions of the transmission facilities

shall be maintained at the power plant and made available, if requested, for CPM audit as set forth in the "Compliance Monitoring Plan."

3. A summary of inspections of the completed transmission facilities, and identification of any nonconforming work and corrective actions taken, signed and sealed by the registered engineer in charge.

4.21.4 References Cited

No references other than those presented in the Approved Project's record were used in the preparation of this analysis.

4.22 TRANSMISSION LINE SAFETY AND NUISANCE

The Commission concluded:

- specific measures have been adopted to minimize the risk of inductive currents along the railroad ROW adjacent to the Project;
- no residences are located along the route of the Project's new generation tie line;
- available scientific evidence does not establish that electromagnetic field (EMFs) pose a significant health hazard to humans;
- electric and magnetic fields generated by the Project's generation tie line would be managed to the extent the California Public Utilities Commission (CPUC) considers appropriate, based on available health effects information;
- the generation tie line would comply with existing LORS for public health and safety;
- the generation tie line would incorporate standard EMF-reducing measures established by the CPUC and used by SCE;
- the Project owner would provide field intensity measurements before and after the line is energized to assess EMF contributions from the project-related current flow; and
- the generation tie line would not result in significant adverse environmental impacts to public health and safety or cause significant direct, indirect, or cumulative impacts as a result of aviation collisions, radio frequency communication interference, fire danger, nuisance or hazardous shocks, or electric and magnetic field exposure (Commission Decision, page TLSN 6).

Under the Modified Project, the main transmission line would be reduced from 2 miles to approximately 500 feet in length, and, due to the relocation of the on-site substation, would not cross the railroad. However, the Modified Project would not alter any of the conclusions listed above.

4.22.1 Engineering Baseline

The Approved Project included an on-site substation that would be connected by a 2-mile-long transmission line to the Pisgah Substation. The Modified Project would relocate the on-site substation from its approved location north of the railroad, to a location south of the railroad on the eastern edge of the site and adjacent to the Pisgah Substation.

In evaluating the potential for transmission safety and nuisance impacts, the Commission considered seven factors: (1) aviation safety, (2) interference with radio-frequency communication, (3) audible noise, (4) fire hazards, (5) hazardous shocks, (6) nuisance shocks, and (7) exposure to electric and magnetic fields. Table 4.22-1 shows the Commission's conclusions (Commission Decision, pages TLSN 2 to 5) as compared to the Modified Project.

Table 4.22-1
Comparison of Transmission Safety and Nuisance Impacts for the Approved and Modified Project

Factor	Impacts from Approved Project	Impacts from Proposed Modified Project
Aviation Safety	The closest area airports are too far to pose a collision hazard to aircraft, according to FAA criteria. The maximum height of 110 feet for the proposed line support structures would be much less than the 200-foot height that triggers the concern over aviation hazard.	The Modified Project would not alter these conclusions.
Interference with Radio-Frequency Communication	The Project's 230 kV line would be built and maintained according to standard SCE practices aimed at minimizing interference. There are no nearby residential receptors, making radio frequency interference or related complaints unlikely.	The Modified Project would not alter these conclusions.
Audible Noise	The Project's 230 kV line would use a low corona design to minimize field strengths. The line is not expected to add significantly to the current background noise levels.	The Modified Project would not alter these conclusions.
Fire Hazards	SCE's standard fire prevention and suppression measures, and compliance with the clearance-related aspects of GO-95 as required in Condition TLSN-3, would ensure that appropriate fire prevention measures were implemented.	The Modified Project would not alter these conclusions and the Condition would be implemented.
Hazardous Shocks	Adherence to minimum national safe operating clearances in areas where the line might be accessible to the public would ensure safety. Compliance with the CPUC's GO-95, as required in Condition TLSN-1, would ensure that adequate measures were implemented.	The Modified Project would not alter these conclusions and the Condition would be implemented.
Nuisance Shocks	As required by Condition TLSN-4, these shocks are effectively minimized through grounding procedures for all metallic objects within the ROW, as specified by the NESC as well as the joint guidelines of the ANSI and the IEEE. To avoid the risk of inductive shocks related to the railroad, Condition TLSN-4 requires a minimum clearance of 300 feet between the proposed transmission lines and the edge of the ROW for the railroad and the transmission line would cross the tracks at a 90-degree angle, and would travel 300 feet from the far side of the ROW before returning to a parallel configuration.	The Modified Project would not alter these conclusions and the Condition would be implemented. The transmission line no longer crosses the railroad.

Table 4.22-1
Comparison of Transmission Safety and Nuisance Impacts for the Approved and Modified Project
(Continued)

Factor	Impacts from Approved Project	Impacts from Proposed Modified Project
Exposure to Electric and Magnetic Fields	Since there are no residences in the vicinity of the Project's line, there would be no long-term human residential EMF exposures. Project-related EMF exposures of potential significance are the short-term exposures of plant workers, regulatory inspectors, maintenance personnel, visitors, or individuals in the immediate vicinity of the lines; are not significantly related to an adverse health effect. The tie line would be designed, constructed, operated, and maintained in compliance with applicable LORS. Implementation of the Conditions would ensure that any impacts are reduced to less than significant levels.	The Modified Project would not alter these conclusions and the Condition would be implemented.

Acronyms:
ANSI - American National Standards Institute
FAA – Federal Aviation Association
GO – General Order
IEEE - Institute of Electrical and Electronics Engineers
NESC - National Electrical Safety Code

In summary, the proposed relocation of the on-site substation and reduction in the length of the transmission line under the Modified Project would reduce the potential for transmission line safety and nuisance impacts but, as with the Approved Project, there is no potential for significant impacts of LORS conformance issues given the location and design of the Project and implementation of the approved Conditions.

4.22.2 Consistency with LORS

In its Commission Decision, the Commission concluded that, with implementation of the Certifications, the Approved Project would comply with all applicable LORS. As with the Approved Project, the Modified Project would comply with all applicable LORS, and no new or additional LORS have been identified.

4.22.3 Conditions of Certification

The conforming changes to the Conditions of Certification for the Modified Project related to Transmission Line Safety and Nuisance are:

TLSN-1 The project owner shall construct the proposed transmission line (anywhere along the area identified by the ~~Applicant~~Project owner as available for its routing) according to the requirements of California Public Utility Commission's GO-95, GO-52, GO-131-D, Title 8, and Group 2, High Voltage Electrical

Safety Orders, sections 2700 through 2974 of the California Code of Regulations, and Southern California Edison's EMF reduction guidelines.

Verification: At least 30 days before ~~starting~~start of construction of the transmission ~~line or related structures and~~ facilities, the project owner shall submit to the Compliance Project Manager (CPM) a letter signed by a California registered electrical engineer affirming that the lines will be constructed according to the requirements stated in the Condition.

TLSN-2 The project owner shall use a qualified individual to measure the strengths of the electric and magnetic fields from the line at the points of maximum intensity along the route for which the ~~Applicant~~Project owner provided specific estimates. The measurements shall be made before and after energization according to the American National Standard Institute/Institute of Electrical and Electronic Engineers (ANSI/IEEE) standard procedures. These measurements shall be completed no later than 6 months after the start of operations.

Verification: The project owner shall file copies of the pre-and postenergization measurements with the CPM within 60 days after completion of the measurements.

TLSN-3 The project owner shall ensure that the rights-of-way of the proposed transmission line are kept free of combustible material, as required under the provisions of section 4292 of the Public Resources Code and section 1250 of Title 14 of the California Code of Regulations.

Verification: During the first five years of plant operation, the project owner shall provide a summary of inspection results and any fire prevention activities carried out along the right-of-way and provide such summaries in the Annual Compliance Report on transmission line safety and nuisance-related requirements.

TLSN-4 The project owner shall ensure that all permanent metallic objects within the right-of-way of the project-related lines are grounded according to industry standards regardless of ownership. A minimum clearance of 300 feet shall be maintained between the proposed transmission line and the edge of the right-of-way for BNSF Railroad Company's railroad tracks.

Verification: At least 30 days before the lines are energized, the project owner shall transmit to the CPM a letter confirming compliance with this condition.

TLSN-5 Project owner's transmission lines shall make any crossing of the BNSF mainline at a 90-degree angle.

Verification: At least 30 days before the lines are energized, the project owner shall transmit to the CPM a letter confirming compliance with this condition.

4.22.4 References Cited

No references other than those presented in the Approved Project's record were used in the preparation of this analysis.

4.23 CUMULATIVE SCENARIO

A resource-specific cumulative impact discussion is provided within each resource area section (Sections 4.2 through 4.17). This section updates the information provided in the record for the Approved Project regarding the overall "Cumulative Scenario."

4.23.1 Updates to the Project's Cumulative Scenario

A Cumulative Scenario for the Project was established as part of the licensing proceedings and documented in the Approved Project's record including the AFC, Staff Assessment/Draft Environmental Impact Statement, Supplemental Staff Assessment (SSA) and the Commission Decision.

The Approved Project's record provided a list of existing and future foreseeable projects in the vicinity of the Project (i.e., Newberry Springs/Ludlow Area). As part of this Amendment effort, a search was performed for new reasonably foreseeable future projects with the potential to increase the cumulative impacts described in the Commission Decision. It should be noted that the Area of Potential Effect varies among resource areas and, as such, no standardized area was analyzed. Therefore, the search for new reasonably foreseeable future projects used the broadest definition of the Newberry Springs/Ludlow Area that was used for the Approved Project (see SSA § B.3, Figure 3).

On February 8, 2011, information compiled by the San Bernardino County Land Use Services Department was reviewed to identify projects being proposed beyond those presented in the SSA and Commission Decision, and no new reasonably foreseeable future actions in the Project vicinity were identified. Additionally, on February 9, 2011, data compiled by the BLM Barstow Field Office, the Commission, and the RWQCB were reviewed for new projects not identified previously in the SSA. Ongoing consultation performed with each of these agencies has not yielded additional results. None of the sources identified new projects being planned for development within the Project vicinity.

Therefore, potential cumulative impacts to resource areas as a result of the Modified Project should be evaluated using the same Cumulative Scenario as that used for the Approved Project.

SECTION 5 PUBLIC AND PRIVATE PROPERTY

The Commission's Power Plant Siting Regulations (Sections 1769(a)(1)(G), (H), & (I)) require that a petition to amend include:

(G) a discussion of how the modification affects the public;

(H) a list of property owners potentially affected by the modification; and

(I) a discussion of the potential effect on nearby property owners, the public and the parties in the application proceedings.

The Modified Project would not affect the public differently than the Approved Project. The primary public concerns raised during the licensing proceedings related to access to private lands in the vicinity of the Approved Project. The Modified Project would not change the site boundaries, the existing public access roads, or the construction and maintenance of an access road around the perimeter of the site and would still result in the overall public benefits described in the Commission Decision.

A list of the adjacent property owners potentially affected by the Modified Project is provided in Appendix G.

The Modified Project would not adversely affect nearby property owners, the public and the parties in the Application proceedings as compared to the Approved Project. The Modified Project would also address some of the concerns raised by parties in the licensing proceedings, as described below.

- A reduction in the number of SunCatchers along the railroad would reduce the potential for glint and glare impacts on BNSF rail operations.
- A reduction in the number of SunCatchers and placement of the remaining SunCatchers in the center of Phase 2 would reduce potential noise impacts and edge effects on wildlife, particularly bighorn sheep and desert tortoise on the northern boundary.
- Relocation of the on-site substation south of the railroad would no longer require that the main transmission line cross the railroad tracks. Reducing the length of the main transmission line would also reduce the number of transmission towers and consequently reduce the potential raven roosting and nesting sites.
- A reduction in the number of SunCatchers and placement of them in Phase 2 would require construction and operation of only one hydrogen generator and further avoid transport of hydrogen over, under, through or near the BNSF ROW.

SECTION 6 CONCLUSIONS AND RECOMMENDATIONS

All impacts associated with the Modified Project would be less than or equal to the impacts of the Approved Project. In addition, for the reasons stated below, Calico Solar believes that the Commission is able to make affirmative conclusions for all of the findings required for approval of an amendment under Section 1769(a)(3) of the Commission's Power Plant Siting Regulations.

1) (A) That the findings specified in section 1755(c), and (d), if applicable; - The findings in section 1755(c) and (d) are:

> *(c) The commission shall not certify any site and related facilities for which one or more significant adverse environmental effects have been identified unless the commission makes both of the following findings:*
>
> > *(1) With respect to matters within the authority of the commission, that changes or alterations have been required in, or incorporated into, the project which mitigate or avoid the significant environmental effects identified in the proceeding.*
> >
> > *(2) With respect to matters not within the commission's authority but within the authority of another agency, that changes or alterations required to mitigate such effects have been adopted by such other agency, or can and should be adopted by such other agency.*
>
> *(d) If the commission cannot make both the findings required under subsection (c), then it may not certify the project unless it specifically finds both of the following:*
>
> > *(1) That specific economic, social, or other considerations make infeasible the mitigation measures or project alternatives identified in the application proceeding; and*
> >
> > *(2) That the benefits of the project outweigh the unavoidable significant adverse environmental effects that may be caused by the construction and operation of the facility.*

Although the overall impacts of the Modified Project would be less than or equal to the impacts of the Approved Project, the Modified Project would still result in the significant adverse environmental effects that the Commission determined could not be avoided or fully mitigated for the Approved Project (see page Override 6). These are:

- cumulative impacts to historic Route 66;
- change in the nature of land use at the Project site from Government Special Public Limited Use and Moderate Use to an intensive utility use for the generation of power and cumulative impact to recreation and wilderness resources in San Bernardino County; and
- impacts to visual vistas in the Project vicinity and cumulative visual impacts to the viewshed.

The Commission concluded: "Therefore, this [D]ecision overrides the remaining significant unavoidable impacts that may result from this project, even with the implementation of the required mitigation measures described in this Decision." (Commission Decision, page Override 8). Since all impacts associated with the Modified Project will be less than or equal to the impacts of the Approved Project, the findings of overriding consideration made by the Commission in its Decision are still valid and applicable.

2) *(B) That the Project would remain in compliance with all applicable laws, ordinances, regulations, and standards, subject to the provisions of Public Resources Code section 25525* - The Modified Project does not make any changes in the Project's compliance with all applicable LORS or provisions of Public Resources Code Section 25525.

3) *(C) That the change will be beneficial to the public, applicant, or interveners* – The Modified Project would be beneficial to the public by ensuring that the Modified Project is built in a timely manner and the economic, renewable energy, and GHG emission reduction benefits are realized. The proposed changes would be beneficial to Calico Solar by allowing the Modified Project to be constructed now rather than in another one to two years.

4) *(D) That there has been a substantial change in circumstances since the Commission certification justifying the change or that the change is based on information which was not known and could not have been known with the exercise of reasonable diligence prior to Commission certification.* – There have been several substantial changes in circumstances since the Commission certification including (i) the sale of Calico Solar, (ii) delay in commercial availability of SunCatchers and (iii) inability to resolve the limitations on access across the railroad. None of these events was known or could have been known prior to or during the Commission's licensing proceedings.

Calico Solar submits this Petition for Amendment and requests that the Commission grant its approval by August 31, 2011. Calico Solar desires this timely action by the Commission in order to permit Calico Solar to undertake required desert tortoise mitigation measures, including possible translocation in 2011, as well as to allow Calico Solar to commence construction or otherwise meet the ARRA funding requirements this year.

The Modified Project, as proposed in this Amendment, is consistent with the findings of fact set forth in the Commission Decision. Therefore, the Commission has the ability to approve this Amendment, and, for reasons respectfully stated above, should approve this Amendment with all expediency.

CONDITIONS OF CERTIFICATION

For purposes of these conditions:

"Completion of project construction" means completion of all construction activities, removal of temporary construction facilities and departure of the engineering procurement and construction contractor."

"Pre-Construction Site Mobilization" for Phase 1 means delivery and installation of temporary construction facilities (such as construction trailers, temporary sanitary facilities, and temporary power); and for Phase 2 means delivery of components or materials to the Project for Phase 2 construction; Pre-Construction Site Mobilization does not include desert tortoise clearance and fencing activities.

"Project Disturbance Area" or "ground disturbance area" means all areas that will be temporarily or permanently disturbed during construction or operation of the Project, including all linear facilities.

"Project footprint" means the Project Disturbance Area and undeveloped areas inside the Project's boundaries that will no longer provide functional habitat value, including but not limited to desert tortoise habitat, Mojave fringe-toed lizard habitat, burrowing owl habitat, rare plant habitat, and areas within ephemeral washes and drainages.

"Security" means the security that is required under other biological conditions of certification to ensure required mitigation measures will be implemented, or payments by the Project Owner into the National Fish and Wildlife Service mitigation account in accordance with the option provided in other conditions of certification.

GEN-1 The project owner shall design, construct, and inspect the project in accordance with the 2007 California Building Standards Code (CBSC), also known as Title 24, California Code of Regulations, which encompasses the California Building Code (CBC), California Building Standards Administrative Code, California Electrical Code, California Mechanical Code, California Plumbing Code, California Energy Code, California Fire Code, California Code for Building Conservation, California Reference Standards Code, and all other applicable engineering LORS in effect at the time initial design plans are submitted to the CBO for review and approval (the CBSC in effect is the edition that has been adopted by the California Building Standards Commission and published at least 180 days previously). The project owner shall ensure that all the provisions of the above applicable codes are enforced during the construction, addition, alteration, moving, demolition, repair, or maintenance of the completed facility. All transmission facilities (lines, switchyards, switching stations and substations) are covered in the Conditions of Certification in the **Transmission System Engineering** section of this document.

In the event that the initial engineering designs are submitted to the CBO when the successor to the 2007 CBSC is in effect, the 2007 CBSC

provisions shall be replaced with the applicable successor provisions. Where, in any specific case, different sections of the code specify different materials, methods of construction or other requirements, the most restrictive shall govern. Where there is a conflict between a general requirement and a specific requirement, the specific requirement shall govern.

The project owner shall ensure that all contracts with contractors, subcontractors, and suppliers clearly specify that all work performed and materials supplied comply with the codes listed above.

Verification: Within 30 days following receipt of the certificate of occupancy, the project owner shall submit to the CPM a statement of verification, signed by the responsible design engineer, attesting that all designs, construction, installation, and inspection requirements of the applicable LORS and the Energy Commission's decision have been met in the area of facility design. The project owner shall provide the CPM a copy of the certificate of occupancy within 30 days of receipt from the CBO.

Once the certificate of occupancy has been issued, the project owner shall inform the CPM at least 30 days prior to any construction, addition, alteration, moving, demolition, repair, or maintenance to be performed on any portion(s) of the completed facility that requires CBO approval for compliance with the above codes. The CPM will then determine if the CBO needs to approve the work.

GEN-2 Before submitting the initial engineering designs for CBO review, the project owner shall furnish the CPM and the CBO with a schedule of facility design submittals, and master drawing and master specifications lists. The schedule shall contain a list of proposed submittal packages of designs, calculations, and specifications for major structures and equipment. To facilitate audits by Energy Commission staff, the project owner shall provide specific packages to the CPM upon request.

Verification: At least 30 days (or a project owner- and CBO-approved alternative time frame) prior to the Pre-Construction Site Mobilization, the project owner shall submit to the CBO and to the CPM the schedule of the facility design submittals. At least 60 days prior to the start of any increment of construction of any major structures or equipment listed in **Facility Design Table 2**, the project owner shall submit to the CBO and to the CPM the master drawing and master specifications lists of documents to be submitted to the CBO for review and approval for such increment. These documents shall be the pertinent design documents for the major structures and equipment listed in **Facility Design Table 2,** below. Major structures and equipment shall be added to or deleted from the table only with CPM approval. The project owner shall provide schedule updates in the monthly compliance report.

Facility Design Table 2
Major Structures and Equipment List

Equipment/System	Quantity (Plant)
SunCatcher Power Generating Unit (CT) Foundation and Connections	1 Lot
PV Tracker Blocks	1 Lot
2 MW Inverter Pads	1 Lot
Modules	1 Lot
Administration Building Structure, Foundation and Connections	1
Maintenance Building Structure, Foundation and Connections	1
Assembly Building Structure, Foundation and Connections	2
Collector Group Generator Step-up Unit Transformer Foundation and Connections	1 Lot
Generator Collection Power Center	1 Lot
Generator Collection Sub-panel	1 Lot
Power Factor Capacitor	1 Lot
Open Bus Switch Rack	6
Shunt Capacitor Bank	1
Dynamic VAR Compression System	1
Disconnect Switch	15
Power Transformer Foundation and Connections	6
Coupling Capacitor Voltage Transformer Foundation and Connections	6
Diesel Power Generator Set Foundation and Connections	1
Fire Water Pump Foundation and Connections	1
Water Treatment System Foundation and Connections	1
Potable/Fire Water Tank Structure, Foundation and Connections	1
Well Water Storage Tank Structure, Foundation and Connections	1
Demineralized Water Storage Tank Structure, Foundation and Connections	2
Hydrogen Bottles Storage Area	1 Lot
Chemical Storage Area	1 Lot
Drainage Systems (including sanitary drain and waste)	1 Lot
High Pressure and Large Diameter Piping and Pipe Racks	1 Lot
HVAC and Refrigeration Systems	1 Lot
Temperature Control and Ventilation Systems (including water and sewer connections)	1 Lot
Building Energy Conservation Systems	1 Lot
Equipment/System	**Quantity (Plant)**
Substation, Switchboards, Transformers, Buses and Towers	1 Lot
Electrical Breakers, Cables/Duct Banks	1 Lot
Prefabricated Assemblies	1 Lot

GEN-3 The project owner shall make payments to the CBO for design review, plan checks, and construction inspections, based upon a reasonable fee schedule to be negotiated between the project owner and the CBO. These fees may be consistent with the fees listed in the 2007 CBC, adjusted for inflation and other appropriate adjustments; may be based on the value of the facilities reviewed; may be based on hourly rates; or may be otherwise agreed upon by the project owner and the CBO.

Verification: The project owner shall make the required payments to the CBO in accordance with the agreement between the project owner and the CBO. The project owner shall send a copy of the CBO's receipt of payment to the CPM in the next monthly compliance report indicating that applicable fees have been paid.

GEN-4 Prior to the start of rough grading, the project owner shall assign a California- registered architect, or a structural or civil engineer, as the resident engineer (RE) in charge of the project. All transmission facilities (lines, switchyards, switching stations, and substations) are addressed in the Conditions of Certification in the **Transmission System Engineering** section of this Decision.

The RE may delegate responsibility for portions of the project to other registered engineers. Registered mechanical and electrical engineers may be delegated responsibility for mechanical and electrical portions of the project, respectively. A project may be divided into parts, provided that each part is clearly defined as a distinct unit. Separate assignments of general responsibility may be made for each designated part.

The RE shall:

1. Monitor progress of construction work requiring CBO design review and inspection to ensure compliance with LORS;
2. Ensure that construction of all facilities subject to CBO design review and inspection conforms in every material respect to applicable LORS, these Conditions of Certification, approved plans, and specifications;
3. Prepare documents to initiate changes in approved drawings and specifications when either directed by the project owner or as required by the Conditions of the project; Be responsible for providing project inspectors and testing agencies with complete and up-to-date sets of stamped drawings, plans, specifications, and any other required documents;
4. Be responsible for the timely submittal of construction progress reports to the CBO from the project inspectors, the contractor, and other engineers who have been delegated responsibility for portions of the project; and
6. Be responsible for notifying the CBO of corrective action or the disposition of items noted on laboratory reports or other tests when they do not

conform to approved plans and specifications.

The resident engineer (or his delegate) must be located at the project site, or be available at the project site within a reasonable period of time, during any hours in which construction takes place.

The RE shall have the authority to halt construction and to require changes or remedial work if the work does not meet requirements.

If the RE or the delegated engineers are reassigned or replaced, the project owner shall submit the name, qualifications and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer.

Verification: At least 30 days (or project owner- and CBO-approved alternative time frame) prior to the start of rough grading, the project owner shall submit to the CBO for review and approval, the resume and registration number of the RE and any other delegated engineers assigned to the project. The project owner shall notify the CPM of the CBO's approvals of the RE and other delegated engineer(s) within five days of the approval.

If the RE or the delegated engineer(s) is subsequently reassigned or replaced, the project owner has five days to submit the resume and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer within five days of the approval.

GEN-5 The project owner shall assign at least one of each of the following California registered engineers to the project: a civil engineer; a soils, geotechnical, or civil engineer experienced and knowledgeable in the practice of soils engineering; and an engineering geologist. Prior to the start of construction, the project owner shall assign at least one of each of the following California registered engineers to the project: a design engineer who is either a structural engineer or a civil engineer fully competent and proficient in the design of power plant structures and equipment supports; a mechanical engineer; and an electrical engineer. (California Business and Professions Code section 6704 et seq., and sections 6730, 6731 and 6736 require state registration to practice as a civil engineer or structural engineer in California). All transmission facilities (lines, switchyards, switching stations, and substations) are handled in the Conditions of Certification in the **Transmission System Engineering** section of this Decision.

The tasks performed by the civil, mechanical, electrical, or design engineers may be divided between two or more engineers, as long as each engineer is responsible for a particular segment of the project (for example, proposed earthwork, civil structures, power plant structures, equipment support). No segment of the project shall have more than one responsible engineer. The transmission line may be the responsibility of a separate California registered electrical engineer.

The project owner shall submit, to the CBO for review and approval, the names, qualifications, and registration numbers of all responsible engineers assigned to the project.

If any one of the designated responsible engineers is subsequently reassigned or replaced, the project owner shall submit the name, qualifications and registration number of the newly assigned responsible engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer.

A. The civil engineer shall:

1. Review the foundation investigations, geotechnical, or soils reports prepared by the soils engineer, the geotechnical engineer, or by a civil engineer experienced and knowledgeable in the practice of soils engineering;
2. Design (or be responsible for the design of), stamp, and sign all plans, calculations, and specifications for proposed site work, civil works, and related facilities requiring design review and inspection by the CBO. At a minimum, these include: grading, site preparation, excavation, compaction, construction of secondary containment, foundations, erosion and sedimentation control structures, drainage facilities, underground utilities, culverts, site access roads and sanitary sewer systems; and
3. Provide consultation to the RE during the construction phase of the project and recommend changes in the design of the civil works facilities and changes to the construction procedures.

B. The soils engineer, geotechnical engineer, or civil engineer experienced and knowledgeable in the practice of soils engineering, shall:

1. Review all the engineering geology reports; Prepare the foundation investigations, geotechnical, or soils reports containing field exploration reports, laboratory tests, and engineering analysis detailing the nature and extent of the soils that could be susceptible to liquefaction, rapid settlement or collapse when saturated under load;
2. Be present, as required, during site grading and earthwork to provide consultation and monitor compliance with requirements set forth in the 2007 CBC (depending on the site conditions, this may be the responsibility of either the soils engineer, the engineering geologist, or both); and
4. Recommend field changes to the civil engineer and RE.

This engineer shall be authorized to halt earthwork and to require changes if site conditions are unsafe or do not conform to the predicted conditions used as the basis for design of earthwork or foundations.

C. The engineering geologist shall:

1. Review all the engineering geology reports and prepare a final soils grading report; and
2. Be present, as required, during site grading and earthwork to provide consultation and monitor compliance with the requirements set forth in

the 2007 CBC (depending on the site conditions, this may be the responsibility of either the soils engineer, the engineering geologist, or both).

D. The design engineer shall:

1. Be directly responsible for the design of the proposed structures and equipment supports;
2. Provide consultation to the RE during design and construction of the project;
3. Monitor construction progress to ensure compliance with engineering LORS;
4. Evaluate and recommend necessary changes in design; and
5. Prepare and sign all major building plans, specifications, and calculations.

E. The mechanical engineer shall be responsible for, and sign and stamp a statement with, each mechanical submittal to the CBO, stating that the proposed final design plans, specifications, and calculations conform to all of the mechanical engineering design requirements set forth in the Energy Commission's Decision. F. The electrical engineer shall:

1. Be responsible for the electrical design of the project; and
2. Sign and stamp electrical design drawings, plans, specifications, and calculations.

Verification: At least 30 days (or project owner and CBO approved alternative time frame) prior to the start of rough grading, the project owner shall submit to the CBO for review and approval, resumes and registration numbers of the responsible civil engineer, soils (geotechnical) engineer and engineering geologist assigned to the project.

At least 30 days (or project owner- and CBO-approved alternative time frame) prior to the start of rough grading, the project owner shall submit to the CBO for review and approval, resumes and registration numbers of the responsible design engineer, mechanical engineer, and electrical engineer assigned to the project.

The project owner shall notify the CPM of the CBO's approvals of the responsible engineers within five days of the approval.

If the designated responsible engineer is subsequently reassigned or replaced, the project owner has five days in which to submit the resume and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer within five days of the approval.

GEN-6 Prior to the start of an activity requiring special inspection, including prefabricated assemblies, the project owner shall assign to the project, qualified and certified special inspector(s) who shall be responsible for the special inspections required by the 2007 CBC. All transmission facilities (lines, switchyards, switching stations, and substations) are handled in Conditions of Certification in the **Transmission System Engineering** section of this

Decision.

A certified weld inspector, certified by the American Welding Society (AWS), and/or American Society of Mechanical Engineers (ASME) as applicable, shall inspect welding performed on-site requiring special inspection (including structural, piping, tanks and pressure vessels).

The special inspector shall:

1. Be a qualified person who shall demonstrate competence, to the satisfaction of the CBO, for inspection of the particular type of construction requiring special or continuous inspection;
3. Inspect the work assigned for conformance with the approved design drawings and specifications; Furnish inspection reports to the CBO and RE. All discrepancies shall be brought to the immediate attention of the RE for correction, then, if uncorrected, to the CBO and the CPM for corrective action; and
4. Submit a final signed report to the RE, CBO, and CPM, stating whether the work requiring special inspection was, to the best of the inspector's knowledge, in conformance with the approved plans, specifications, and other provisions of the applicable edition of the CBC.

Verification: At least 15 days (or project owner- and CBO-approved alternative time frame) prior to the start of an activity requiring special inspection, the project owner shall submit to the CBO for review and approval, with a copy to the CPM, the name(s) and qualifications of the certified weld inspector(s), or other certified special inspector(s) assigned to the project to perform one or more of the duties set forth above. The project owner shall also submit to the CPM a copy of the CBO's approval of the qualifications of all special inspectors in the next monthly compliance report.

If the special inspector is subsequently reassigned or replaced, the project owner has five days in which to submit the name and qualifications of the newly assigned special inspector to the CBO for approval. The project owner shall notify the CPM of the CBO's approval of the newly assigned inspector within 5 days of the approval.

GEN-7 If any discrepancy in design and/or construction is discovered in any engineering work that has undergone CBO design review and approval, the project owner shall document the discrepancy and recommend required corrective actions. The discrepancy documentation shall be submitted to the CBO for review and approval. The discrepancy documentation shall reference this Condition of Certification and, if appropriate, applicable sections of the CBC and/or other LORS.

Verification: The project owner shall transmit a copy of the CBO's approval of any corrective action taken to resolve a discrepancy to the CPM in the next monthly compliance report. If any corrective action is disapproved, the project owner shall advise the CPM, within five days, of the reason for disapproval and the revised corrective action to obtain CBO's approval.

GEN-8 The project owner shall obtain the CBO's final approval of all completed work that has undergone CBO design review and approval. The

project owner shall request the CBO to inspect the completed structure and review the submitted documents. The project owner shall notify the CPM after obtaining the CBO's final approval. The project owner shall retain one set of approved engineering plans, specifications, and calculations (including all approved changes) at the project site or at another accessible location during the operating life of the project. Electronic copies of the approved plans, specifications, calculations, and marked-up as-builts shall be provided to the CBO for retention by the CPM.

Verification: Within 15 days of the completion of any work, the project owner shall submit to the CBO, with a copy to the CPM, in the next monthly compliance report, (a) a written notice that the completed work is ready for final inspection, and (b) a signed statement that the work conforms to the final approved plans. After storing the final approved engineering plans, specifications, and calculations described above, the project owner shall submit to the CPM a letter stating both that the above documents have been stored and the storage location of those documents.

Within 90 days of the completion of construction, the project owner shall provide to the CBO three sets of electronic copies of the above documents at the project owner's expense. These are to be provided in the form of "read only" (Adobe .pdf 6.0) files, with restricted (password-protected) printing privileges, on archive quality compact discs.

CIVIL-1 The project owner shall submit to the CBO for review and approval the following:

1. Design of the proposed drainage structures and the grading plan;
2. An erosion and sedimentation control plan;
3. Related calculations and specifications, signed and stamped by the responsible civil engineer; and
4. Soils, geotechnical, or foundation investigations reports required by the 2007 CBC.

Verification: At least 15 days (or project owner- and CBO-approved alternative time frame) prior to the start of rough grading the project owner shall submit the documents described above to the CBO for design review and approval. In the next monthly compliance report following the CBO's approval, the project owner shall submit a written statement certifying that the documents have been approved by the CBO.

CIVIL-2 The resident engineer shall, if appropriate, stop all earthwork and construction in the affected areas when the responsible soils engineer, geotechnical engineer, or the civil engineer experienced and knowledgeable in the practice of soils engineering identifies unforeseen adverse soil or geologic conditions. The project owner shall submit modified plans, specifications, and calculations to the CBO based on these new conditions. The project owner shall obtain approval from the CBO before resuming earthwork and construction in the affected area.

Verification: The project owner shall notify the CPM within 24 hours, when earthwork and construction is stopped as a result of unforeseen adverse geologic/soil conditions. Within 24 hours of the CBO's approval to resume earthwork and construction in the affected areas, the project owner shall provide to the CPM a copy of the CBO's approval.

CIVIL-3 The project owner shall perform inspections in accordance with the 2007 CBC. All plant site-grading operations, for which a grading permit is required, shall be subject to inspection by the CBO.

If, in the course of inspection, it is discovered that the work is not being performed in accordance with the approved plans, the discrepancies shall be reported immediately to the resident engineer, the CBO, and the CPM. The project owner shall prepare a written report, with copies to the CBO and the CPM, detailing all discrepancies, non-compliance items, and the proposed corrective action.

Verification: Within five days of the discovery of any discrepancies, the resident engineer shall transmit to the CBO and the CPM a non-conformance report (NCR), and the proposed corrective action for review and approval. Within five days of resolution of the NCR, the project owner shall submit the details of the corrective action to the CBO and the CPM. A list of NCRs, for the reporting month, shall also be included in the

following monthly compliance report.

CIVIL-4 After completion of finished grading and erosion and sedimentation control and drainage work, the project owner shall obtain the CBO's approval of the final grading plans (including final changes) for the erosion and sedimentation control work. The civil engineer shall state that the work within his/her area of responsibility was done in accordance with the final approved plans.

Verification: Within 30 days (or project owner- and CBO-approved alternative time frame) of the completion of the erosion and sediment control mitigation and drainage work, the project owner shall submit to the CBO, for review and approval, the final grading plans (including final changes) and the responsible civil engineer's signed statement that the installation of the facilities and all erosion control measures were completed in accordance with the final approved combined grading plans, and that the facilities are adequate for their intended purposes, along with a copy of the transmittal letter to the CPM. The project owner shall submit a copy of the CBO's approval to the CPM in the next monthly compliance report.

STRUC-1 Prior to the start of any increment of construction of any major structure or component listed in **Facility Design Table 2** of Condition of Certification **GEN-2,** above, the project owner shall submit to the CBO for design review and approval the proposed lateral force procedures for project structures and the applicable designs, plans and drawings for project structures. Proposed lateral force procedures, designs, plans and drawings shall be those for the following items (from **Table 2,** above):

1. Major project structures;
2. Major foundations, equipment supports, and anchorage; and
3. Large field-fabricated tanks.

Construction of any structure or component shall not begin until the CBO has approved the lateral force procedures to be employed in designing that structure or component.

The project owner shall:

1. Obtain approval from the CBO of lateral force procedures proposed for project structures;
2. Obtain approval from the CBO for the final design plans, specifications, calculations, soils reports, and applicable quality control procedures. If there are conflicting requirements, the more stringent shall govern (for example, highest loads, or lowest allowable stresses shall govern). All plans, calculations, and specifications for foundations that support structures shall be filed concurrently with the structure plans, calculations, and specifications;
3. Submit to the CBO the required number of copies of the structural plans, specifications, calculations, and other required documents of the designated major structures prior to the start of on-site fabrication and installation of each structure, equipment support, or foundation;
4. Ensure that the final plans, calculations, and specifications clearly reflect the inclusion of approved criteria, assumptions, and methods used to develop the design. The final designs, plans, calculations, and specifications shall be signed and stamped by the responsible design engineer; and
5. Submit to the CBO the responsible design engineer's signed statement that the final design plans conform to applicable LORS.

Verification: At least 60 days (or project owner and CBO approved alternative time frame) prior to the start of any increment of construction of any structure or component listed in **Facility Design Table 2** of Condition of Certification **GEN-2,** above, the project owner shall submit to the CBO the above final design plans of such increment, specifications and calculations, with a copy of the transmittal letter to the CPM.

The project owner shall submit to the CPM, in the next monthly compliance report, a

copy of a statement from the CBO that the proposed structural plans,

specifications, and calculations have been approved and comply with the requirements set forth in applicable engineering LORS.

STRUC-2 The project owner shall submit to the CBO the required number of sets of the following documents related to work that has undergone CBO design review and approval:

1. Concrete cylinder strength test reports (including date of testing, date sample taken, design concrete strength, tested cylinder strength, age of test, type and size of sample, location and quantity of concrete placement from which sample was taken, and mix design designation and parameters);
2. Concrete pour sign-off sheets;
3. Bolt torque inspection reports (including location of test, date, bolt size, and recorded torques);
4. Field weld inspection reports (including type of weld, location of weld, inspection of non-destructive testing (NDT) procedure and results, welder qualifications, certifications, qualified procedure description or number (ref: AWS); and
5. Reports covering other structural activities requiring special inspections shall be in accordance with the 2007 CBC.

Verification: If a discrepancy is discovered in any of the above data, the project owner shall, within 5 days, prepare and submit an NCR describing the nature of the discrepancies and the proposed corrective action to the CBO, with a copy of the transmittal letter to the CPM. The NCR shall reference the Condition(s) of Certification and the applicable CBC chapter and section. Within five days of resolution of the NCR, the project owner shall submit a copy of the corrective action to the CBO and the CPM.

The project owner shall transmit a copy of the CBO's approval or disapproval of the corrective action to the CPM within 15 days. If disapproved, the project owner shall advise the CPM, within five days, the reason for disapproval, and the revised corrective action to obtain CBO's approval.

STRUC-3 The project owner shall submit to the CBO design changes to the final plans required by the 2007 CBC, including the revised drawings, specifications, calculations, and a complete description of, and supporting rationale for, the proposed changes, and shall give to the CBO prior notice of the intended filing.

Verification: On a schedule suitable to the CBO, the project owner shall notify the CBO of the intended filing of design changes, and shall submit the required number of sets of revised drawings and the required number of copies of the other above-mentioned documents to the CBO, with a copy of the transmittal letter to the CPM. The project owner shall notify the CPM, via the monthly compliance report, when the CBO

has approved the revised plans.

STRUC-4 Tanks and vessels containing quantities of toxic or hazardous materials exceeding amounts specified in the 2007 CBC shall, at a minimum, be designed to comply with the requirements of that chapter.

Verification: At least 30 days (or project owner- and CBO-approved alternate time frame) prior to the start of installation of the tanks or vessels containing the above specified quantities of toxic or hazardous materials, the project owner shall submit to the CBO for design review and approval final design plans, specifications, and calculations, including a copy of the signed and stamped engineer's certification.

The project owner shall send copies of the CBO approvals of plan checks to the CPM in the following monthly compliance report. The project owner shall also transmit a copy of the CBO's inspection approvals to the CPM in the monthly compliance report following completion of any inspection.

MECH-1 The project owner shall submit, for CBO design review and approval, the proposed final design, specifications and calculations for each plant major piping and plumbing system listed in **Facility Design Table 2,** Condition of Certification **GEN-2,** above. Physical layout drawings and drawings not related to code compliance and life safety need not be submitted. The submittal shall also include the applicable QA/QC procedures. Upon completion of construction of any such major piping or plumbing system, the project owner shall request the CBO's inspection approval of that construction.

The responsible mechanical engineer shall stamp and sign all plans, drawings, and calculations for the major piping and plumbing systems, subject to CBO design review and approval, and submit a signed statement to the CBO when the proposed piping and plumbing systems have been designed, fabricated, and installed in accordance with all of the applicable laws, ordinances, regulations and industry standards, which may include, but are not limited to:

- American National Standards Institute (ANSI) B31.1 (Power Piping Code);
- ANSI B31 .2 (Fuel Gas Piping Code);
- ANSI B31 .3 (Chemical Plant and Petroleum Refinery Piping Code);
- ANSI B31 .8 (Gas Transmission and Distribution Piping Code);
- Title 24, California Code of Regulations, Part 5 (California Plumbing Code); Title 24, California Code of Regulations, Part 6 (California Energy Code, for building energy conservation systems and temperature control and ventilation systems);
- Title 24, California Code of Regulations, Part 2 (California Building Code); and
- San Bernardino County codes.

The CBO may deputize inspectors to carry out the functions of the code enforcement agency.

Verification: At least 30 days (or project owner- and CBO-approved alternative time frame) prior to the start of any increment of major piping or plumbing construction listed in **Facility Design Table 2,** Condition of Certification **GEN-2,** above, the project owner shall submit to the CBO for design review and approval the final plans, specifications, and calculations of such increment, including a copy of the signed and stamped statement from the responsible mechanical engineer certifying compliance with applicable LORS, and shall send the CPM a copy of the transmittal letter in the next monthly compliance report.

The project owner shall transmit to the CPM, in the monthly compliance report following completion of any inspection, a copy of the transmittal letter conveying the CBO's inspection approvals.

MECH-2 For all pressure vessels installed in the plant, the project owner shall submit

to the CBO and California Occupational Safety and Health Administration (Cal-OSHA), prior to operation, the code certification papers and other documents required by applicable LORS. Upon completion of the installation of any pressure vessel, the project owner shall request the appropriate CBO and/or Cal-OSHA inspection of that installation.

The project owner shall:

1. Ensure that all boilers and fired and unfired pressure vessels are designed, fabricated, and installed in accordance with the appropriate section of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, or other applicable code. Vendor certification, with identification of applicable code, shall be submitted for prefabricated vessels and tanks; and
2. Have the responsible design engineer submit a statement to the CBO that the proposed final design plans, specifications, and calculations conform to all of the requirements set forth in the appropriate ASME Boiler and Pressure Vessel Code or other applicable codes.

Verification: At least 30 days (or project owner- and CBO-approved alternative time frame) prior to the start of on-site fabrication or installation of any pressure vessel, the project owner shall submit to the CBO for design review and approval, the above listed documents, including a copy of the signed and stamped engineer's certification, with a copy of the transmittal letter to the CPM.

The project owner shall transmit to the CPM, in the monthly compliance report following completion of any inspection, a copy of the transmittal letter conveying the CBO's and/or Cal-OSHA inspection approvals.

MECH-3 The project owner shall submit to the CBO for design review and approval the design plans, specifications, calculations, and quality control procedures for any heating, ventilating, air conditioning (HVAC) or refrigeration system. Packaged HVAC systems, where used, shall be identified with the appropriate manufacturer's data sheets.

The project owner shall design and install all HVAC and refrigeration systems within buildings and related structures in accordance with the CBC and other applicable codes. Upon completion of any increment of construction, the project owner shall request the CBO's inspection and approval of that construction. The final plans, specifications and calculations shall include approved criteria, assumptions, and methods used to develop the design. In addition, the responsible mechanical engineer shall sign and stamp all plans, drawings and calculations and submit a signed statement to the CBO that the proposed final design plans, specifications and calculations conform with the applicable LORS.

Verification: At least 30 days (or project owner- and CBO-approved alternative time frame) prior to the start of construction of any HVAC or refrigeration system, the project owner shall submit to the CBO the required HVAC and refrigeration calculations, plans, and specifications, including a copy of the signed and stamped

statement from the responsible mechanical engineer certifying compliance with the CBC and other applicable codes, with a copy of the transmittal letter to the CPM.

ELEC-1 Prior to the start of any increment of electrical construction for all electrical equipment and systems 480 Volts or higher (see a representative list, below), with the exception of underground duct work and any physical layout drawings and drawings not related to code compliance and life safety, the project owner shall submit, for CBO design review and approval, the proposed final design, specifications, and calculations. Upon approval, the above listed plans, together with design changes and design change notices, shall remain on the site or at another accessible location for the operating life of the project. The project owner shall request that the CBO inspect the installation to ensure compliance with the requirements of applicable LORS. All transmission facilities (lines, switchyards, switching stations, and substations) are handled in Conditions of Certification in the **Transmission System Engineering** section of this Decision.

A. Final plant design plans shall include:

1. one-line diagrams for the 13.8-kV, 4.16-kV, 34.5-kV, 230-kV480 V and 1000 V systems; and
2. system grounding drawings.

B. Final plant calculations must establish:

1. short-circuit ratings of plant equipment;
2. ampacity of feeder cables;
3. voltage drop in feeder cables;
4. system grounding requirements;
5. coordination study calculations for fuses, circuit breakers and protective relay settings for the 13.8-kV, 4.16-kV, 34.5-kV, 230-kV 480 V and 1000 V systems;
6. system grounding requirements; and 7.

   lighting energy calculations.

C. The following activities shall be reported to the CPM in the monthly compliance report:

1. Receipt or delay of major electrical equipment;
2. Testing or energization of major electrical equipment; and
3. A signed statement by the registered electrical engineer certifying that the proposed final design plans and specifications conform to requirements set forth in the Energy Commission decision.

Verification: At least 30 days (or project owner- and CBO-approved alternative time frame) prior to the start of each increment of electrical construction, the project owner shall submit to the CBO for design review and approval the above listed documents for such increment. The project owner shall include in this submittal a copy of the signed and stamped statement from the responsible electrical engineer attesting

compliance with the applicable LORS, and shall send the CPM a copy of the transmittal letter in the next monthly compliance report.

TSE-1 The project owner shall furnish to the Compliance Project Manager (CPM) and to the Chief Building Official (CBO) a schedule of transmission facility design submittals, a Master Drawing List, a Master Specifications List, and a Major Equipment and Structure List. The schedule shall contain a description and list of proposed submittal packages for design, calculations, and specifications for major structures and equipment. To facilitate audits by Energy Commission staff, the project owner shall provide designated packages to the CPM when requested.

Verification: At least 60 days prior to the start of construction of transmission facilities (or a lesser number of days mutually agreed to by the project owner and the CBO), the project owner shall submit the schedule, a Master Drawing List, and a Master Specifications List to the CBO and to the CPM. The schedule shall contain a description and list of proposed submittal packages for design, calculations, and specifications for major structures and equipment (see a list of major equipment in **Transmission System Engineering Table 1,** Major Equipment List below). Additions and deletions shall be made to the table only with CPM and CBO approval. The project owner shall provide schedule updates in the Monthly Compliance Report.

Transmission System Engineering Table 1
Major Equipment List

Breakers	Take Off Facilities
Step-Up Transformer	Electrical Control Building
Switchyard	Switchyard Control Building
Busses	Transmission Pole/Tower
Surge Arrestors	Grounding System
Disconnects	

TSE-2 The project owner shall assign an electrical engineer and at least one of each of the following to the project: A) a civil engineer; B) a geotechnical engineer or a civil engineer experienced and knowledgeable in the practice of soils engineering; C) a design engineer who is either a structural engineer or a civil engineer fully competent and proficient in the design of power plant structures and equipment supports; or D) a mechanical engineer. (Business and Professions Code Sections 6704 et seq. require state registration to practice as a civil engineer or structural engineer in California.)

The tasks performed by the civil, mechanical, electrical, or design engineers may be divided between two or more engineers, as long as each engineer is responsible for a particular segment of the project (e.g., proposed earthwork, civil structures, power plant structures, equipment support). No segment of the project shall have more than one responsible engineer. The transmission line may be the responsibility of a separate California-registered electrical engineer. The civil, geotechnical or civil, and design engineer assigned in conformance with Facility Design Condition **GEN-5,** may be responsible for design and review of the TSE facilities.

The project owner shall submit to the CBO for review and approval, the names, qualifications, and registration numbers of all engineers assigned to the project. If any one of the designated engineers is subsequently reassigned or replaced, the project owner shall submit the name, qualifications, and registration number of the newly assigned engineer to the CBO for review and approval.

The project owner shall notify the CPM of the CBO's approval of the new engineer. This engineer shall be authorized to halt earthwork and to require changes if site conditions are unsafe or do not conform to predicted conditions used as a basis for design of earthwork or foundations.

The electrical engineer shall:

1. Be responsible for the electrical design of the power plant switchyard, outlet and termination facilities; and
2. Sign and stamp electrical design drawings, plans, specifications, and calculations.

Verification: At least 30 days prior to the start of rough grading (or a lesser number of days mutually agreed to by the project owner and the CBO), the project owner shall submit to the CBO for review and approval, the names, qualifications, and registration numbers of all the responsible engineers assigned to the project. The project owner shall notify the CPM of the CBO's approvals of the engineers within five days of the approval.

If the designated responsible engineer is subsequently reassigned or replaced, the project owner shall have five days in which to submit the name, qualifications, and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer within five days of that approval.

TSE-3 If any discrepancy in design and/or construction is discovered in any engineering work that has previously undergone CBO design review and approval, the project owner shall document the discrepancy and recommend corrective action, (California Building Code, 1998, Chapter 1, Section 108.4, Approval Required; Chapter 17, Section 1701.3, Duties and Responsibilities of the Special Inspector; Appendix Chapter 33, Section 3317.7, Notification of Noncompliance). The discrepancy documentation shall become a controlled document and shall be submitted to the CBO for review and approval and shall reference this condition of certification.

Verification: The project owner shall submit a copy of the CBO's approval or disapproval of any corrective action taken to resolve a discrepancy to the CPM within 15 days of receipt. If disapproved, the project owner shall advise the CPM, within five days, the reason for disapproval, and the revised corrective action required obtaining the CBO's approval.

TSE-4 For the power plant switchyard, outlet line, and termination, the project owner

shall not begin any increment of construction until plans for that increment have been approved by the CBO. These plans, together with design changes and design change notices, shall remain on the site for one year after completion of construction. The project owner
shall request that the CBO inspect the installation to ensure compliance with the requirements of applicable LORS. The following activities shall be reported in the Monthly Compliance Report:

- Receipt or delay of major electrical equipment;
- Testing or energization of major electrical equipment; and
- The number of electrical drawings approved, submitted for approval, and still to be submitted.

Verification: At least 30 days prior to the start of each increment of construction (or a lesser number of days mutually agreed to by the project owner and the CBO), the project owner shall submit to the CBO for review and approval, for such increment, the final design plans, specifications, and calculations for equipment and systems of the power plant switchyard, outlet line, and termination, including a copy of the signed and stamped statement from the responsible electrical engineer attesting to compliance with the applicable LORS, and shall include a copy of the transmittal letter in the next Monthly Compliance Report.

TSE-5 The project owner shall ensure that the design, construction, and operation of the proposed transmission facilities conform to all applicable LORS, including the requirements listed below. The project owner shall submit the required number of copies of the design drawings and calculations as determined by the CBO.

1. The Calico Solar Project shall be interconnected to the SCE grid via a segment of 230kV, 1590 kcmil-ACSR, approximately 500 foot 2 mile long single circuit extending from the new substation on the project site to the Pisgah SCE Substation.

2. The Calico Solar Project substation on the project site shall use 34.5kV, 1200A, 25 breakers and six, three phase, 100/133/167.7 MVA, 34.5kV/230 kV transformers.

3. The power plant outlet line shall meet or exceed the electrical, mechanical, civil, and structural requirements of CPUC General Order 95 and General Order 98 or National Electric Safety Code (NESC), Title 8 of the California Code and Regulations (Title 8), Articles 35, 36, and 37 of the “High Voltage Electric Safety Orders”, California ISO standards, National Electric Code (NEC), and related industry standards.

4. Breakers and busses in the power plant switchyard and other switchyards, where applicable, shall be sized to comply with a short-circuit analysis.

5. Outlet line crossings and line parallels with transmission and distribution facilities shall be coordinated with the transmission line owner and comply with that owner's standards.

6. The project conductors shall be sized to accommodate the full output from the project.

7. Termination facilities shall comply with applicable SCE interconnection standards.

8. The generating facility shall provide sufficient reactive power resources on the project site as specified by the power factor design criteria requirements in Large Generator Interconnection Agreement.

Verification: At least 30 days prior to the start of construction of transmission facilities (or a lesser number of days mutually agreed to by the project owner and CBO), the project owner shall submit to the CBO for approval:

1. Design drawings, specifications, and calculations conforming with CPUC General Order 95 and General Order 98 or NESC; Title 8, California Code of Regulations, Articles 35, 36, and 37 of the "High Voltage Electric Safety Orders"; NEC; applicable interconnection standards, and related industry standards for the poles/towers, foundations, anchor bolts, conductors, grounding systems, and major switchyard equipment.

2. For each element of the transmission facilities identified above, the submittal package to the CBO shall contain the design criteria, a discussion of the calculation method(s), a sample calculation based on worst-case conditions,[1] and a statement signed and sealed by the registered engineer in responsible charge, or other acceptable alternative verification, that the transmission element(s) will conform with CPUC General Order 95 or NESC; Title 8, California Code of Regulations, Articles 35, 36 and 37 of the "High Voltage Electric Safety Orders"; NEC; applicable interconnection standards, and related industry standards.

3. Electrical one-line diagrams signed and sealed by the registered professional electrical engineer in responsible charge, a route map, and an engineering description of equipment and the configurations covered by requirements **TSE-1 through 5** above.

TSE-6 The project owner shall provide the following Notice to the California Independent System Operator (California ISO) prior to synchronizing the facility with the California transmission system:

1. At least one week prior to synchronizing the facility with the grid for testing, provide the California ISO a letter stating the proposed date of synchronization; and

2. At least one business day prior to synchronizing the facility with the grid for testing, provide telephone notification to the California ISO Outage Coordination Department.

Verification: The project owner shall provide copies of the California ISO letter

to the CPM when it is sent to the California ISO one week prior to initial synchronization with the grid. A report of the conversation with the California ISO shall be provided electronically to the CPM one day before synchronizing the facility with the California transmission system for the first time.

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[1] Worst-case conditions for the foundations would include for instance, a dead-end or angle pole.

TSE-7 The project owner shall be responsible for the inspection of the transmission facilities during and after project construction, and any subsequent CPM and CBO approved changes thereto, to ensure conformance with CPUC GO-95 or NESC; Title 8, CCR, Articles 35, 36 and 37 of the "High Voltage Electric Safety Orders"; applicable interconnection standards; NEC; and related industry standards. In case of non-conformance, the project owner shall inform the CPM and CBO in writing, within 10 days of discovering such non-conformance and describe the corrective actions to be taken.

Verification: Within 60 days after first synchronization of the project, the project owner shall transmit to the CPM and CBO:

1. As-built engineering description(s) and one-line drawings of the electrical portion of the facilities signed and sealed by the registered electrical engineer in responsible charge. A statement attesting to conformance with CPUC GO-95 or NESC; Title 8, California Code of Regulations, Articles 35, 36 and 37 of the "High Voltage Electric Safety Orders"; applicable interconnection standards; NEC; and related industry standards, and these conditions shall be provided concurrently with the submittal of the as-built plans.
2. An as-built engineering description of the mechanical, structural, and civil portions of the transmission facilities signed and sealed by the registered engineer in responsible charge or acceptable alternative verification. As-built drawings of the electrical, mechanical, structural, and civil portions of the transmission facilities shall be maintained at the power plant and made available, if requested, for CPM audit as set forth in the "Compliance Monitoring Plan."
3. A summary of inspections of the completed transmission facilities, and identification of any nonconforming work and corrective actions taken, signed and sealed by the registered engineer in charge.

TLSN-1 The project owner shall construct the proposed transmission line (anywhere along the area identified by the Project owner as available for its routing) according to the requirements of California Public Utility Commission's GO-95, GO-52, GO-131-D, Title 8, and Group 2, High Voltage Electrical Safety Orders, sections 2700 through 2974 of the California Code of Regulations, and Southern California Edison's EMF reduction guidelines.

Verification: At least 30 days before start of construction of the transmission facilities, the project owner shall submit to the Compliance Project Manager (CPM) a letter signed by a California registered electrical engineer affirming that the lines will be constructed according to the requirements stated in the Condition.

TLSN-2 The project owner shall use a qualified individual to measure the strengths of the electric and magnetic fields from the line at the points of maximum intensity along the route for which the Project owner provided specific estimates. The measurements shall be made before and after energization according to the American National Standard Institute/Institute of Electrical and Electronic Engineers (ANSI/IEEE) standard procedures. These measurements shall be completed no later than 6 months after the start of operations.

Verification: The project owner shall file copies of the pre-and postenergization measurements with the CPM within 60 days after completion of the measurements.

TLSN-3 The project owner shall ensure that the rights-of-way of the proposed transmission line are kept free of combustible material, as required under the provisions of section 4292 of the Public Resources Code and section 1250 of Title 14 of the California Code of Regulations.

Verification: During the first five years of plant operation, the project owner shall provide a summary of inspection results and any fire prevention activities carried out along the right-of-way and provide such summaries in the Annual Compliance Report on transmission line safety and nuisance-related requirements.

TLSN-4 The project owner shall ensure that all permanent metallic objects within the right-of-way of the project-related lines are grounded according to industry standards regardless of ownership. A minimum clearance of 300 feet shall be maintained between the proposed transmission line and the edge of the right-of-way for BNSF Railroad Company's railroad tracks.

Verification: At least 30 days before the lines are energized, the project owner shall transmit to the CPM a letter confirming compliance with this condition.

TLSN-5 Project owner's transmission lines shall make any crossing of the BNSF mainline at a 90-degree angle.

Verification: At least 30 days before the lines are energized, the project owner shall transmit to the CPM a letter confirming compliance with this condition.

AQ-SC1 Air Quality Construction Mitigation Manager (AQCMM): The project owner shall designate and retain an on-site AQCMM who shall be responsible for directing and documenting compliance with Conditions of Certification **AQ-SC3, AQ-SC4** and **AQ-SC5** for the entire project site and linear facility construction. The on-site AQCMM may delegate responsibilities to one or more AQCMM Delegates. The AQCMM and AQCMM Delegates shall have full access to all areas of construction on the project site and linear facilities, and shall have the authority to stop any or all construction activities as warranted by applicable construction mitigation conditions. The AQCMM and AQCMM Delegates may have other responsibilities in addition to those described in this Condition. The AQCMM shall not be terminated without written consent of the Compliance Project Manager (CPM).

Verification: At least 30 days prior to Pre-Construction Site Mobilization, the project owner shall submit to the CPM for approval, the name, resume, qualifications, and contact information for the on-site AQCMM and all AQCMM Delegates.

AQ-SC2 Air Quality Construction Mitigation Plan (AQCMP): The project owner shall provide an AQCMP, for approval, which details the steps that will be taken and the reporting requirements necessary to ensure compliance with Conditions of Certification **AQ-SC3, AQ-SC4,** and **AQ-SC5.**

Verification: At least 30 days prior to Pre-Construction Site Mobilization, the project owner shall submit the AQCMP to the CPM for approval. The AQCMP shall include effectiveness and environmental data for the proposed soil stabilizer. The CPM will notify the project owner of any necessary modifications to the plan within 15 days from the date of receipt.

AQ-SC3 Construction Fugitive Dust Control: The AQCMM shall submit documentation to the CPM in each Monthly Compliance Report that demonstrates compliance with the Air Quality Construction Mitigation Plan (AQCMP) mitigation measures for the purposes of minimizing fugitive dust emission creation from construction activities and preventing all fugitive dust plumes that would not comply with the performance standards identified in Condition **AQ-SC4** from leaving the project site. The following fugitive dust mitigation measures shall be included in the Air Quality Construction Mitigation Plan (AQCMP) required by **AQ-SC2,** and any deviation from the AQCMP mitigation measures shall require prior CPM notification and approval.

A. The main access roads through the facility to the power block areas will be either paved or stabilized using soil binders, or equivalent methods, to provide a stabilized surface that is similar for the purposes of dust control to paving, that may or may not include a crushed rock (gravel or similar material with fines removed) top layer, prior to initiating construction in the main power block area, and delivery areas for

operations materials (chemicals, replacement parts, etc.) will be paved or treated prior to taking initial deliveries.

B. All unpaved construction roads and unpaved operation and maintenance site roads, as they are being constructed, shall be stabilized with a non-toxic soil stabilizer or soil weighting agent that can be determined to be both as efficient or more efficient for fugitive dust control as ARB approved soil stabilizers, and shall not increase any other environmental impacts including loss of vegetation to areas beyond where the soil stabilizers are being applied for dust control. All other disturbed areas in the project and linear construction sites shall be watered as frequently as necessary during grading (consistent with Biology Conditions of Certification that address the minimization of standing water); and after active construction activities shall be stabilized with a nontoxic soil stabilizer or soil weighting agent, or alternative approved soil stabilizing methods, in order to comply with the dust mitigation objectives of Condition of Certification **AQ-SC4.** The frequency of watering can be reduced or eliminated during periods of precipitation.

C. No vehicle shall exceed 10 miles per hour on unpaved areas within the construction site, with the exception that vehicles may travel up to 25 miles per hour on stabilized unpaved roads as long as such speeds do not create visible dust emissions.

D. Visible speed limit signs shall be posted at the construction site entrances.

E. All construction equipment vehicle tires shall be inspected and washed as necessary to be cleaned free of dirt prior to entering paved roadways.

F. Gravel ramps of at least 20 feet in length must be provided at the tire washing/cleaning station.

G. All unpaved exits from the construction site shall be graveled or treated to prevent track-out to public roadways.

H. All construction vehicles shall enter the construction site through the treated entrance roadways, unless an alternative route has been submitted to and approved by the CPM.

I. Construction areas adjacent to any paved roadway below the grade of the surrounding construction area or otherwise directly impacted by sediment from site drainage shall be provided with sandbags or other equivalently effective measures to prevent run-off to roadways, or other similar run-off control measures as specified in the Storm Water Pollution Prevention Plan (SWPPP), only when such SWPPP measures are necessary so that this condition does not conflict with the requirements of the SWPPP.

J. All paved roads within the construction site shall be swept daily or as needed (less during periods of precipitation) on days when construction activity occurs to prevent the accumulation of dirt and debris.

K. At least the first 500 feet of any paved public roadway exiting the construction site or exiting other unpaved roads en route from the construction site or construction staging areas shall be swept as needed (less during periods of precipitation) on days when construction activity occurs or on any other day when dirt or runoff resulting from the construction site activities is visible on the public paved roadways.

L. All soil storage piles and disturbed areas that remain inactive for longer than 10 days shall be covered, or shall be treated with appropriate dust suppressant compounds.

M. All vehicles that are used to transport solid bulk material on public roadways and that have potential to cause visible emissions shall be provided with a cover, or the materials shall be sufficiently wetted and loaded onto the trucks in a manner to provide at least 2 feet of freeboard.

N. Wind erosion control techniques (such as windbreaks, water, chemical dust suppressants, and/or vegetation) shall be used on all construction areas that may be disturbed. Any windbreaks installed to comply with this Condition shall remain in place until the soil is stabilized or permanently covered with vegetation.

Verification: The AQCMM shall provide the CPM a Monthly Compliance Report to include the following to demonstrate control of fugitive dust emissions:

A. A summary of all actions taken to maintain compliance with this Condition;

B. Copies of any complaints filed with the District in relation to project construction; and

C. Any other documentation deemed necessary by the, CPM or AQCMM to verify compliance with this Condition. Such information may be provided via electronic format or disk at the project owner's discretion.

AQ-SC4 Dust Plume Response Requirement: The AQCMM or an AQCMM Delegate shall monitor all construction activities for visible dust plumes. Observations of visible dust plumes that have the potential to be transported (A) off the project site and within 400 feet upwind of any regularly occupied structures not owned by the project owner or (B) 200 feet beyond the centerline of the construction of linear facilities indicate that existing mitigation measures are not resulting in effective mitigation. The AQCMP shall include a section detailing how the additional mitigation measures will be accomplished within the time limits specified. The AQCMM or Delegate shall implement the following procedures for additional mitigation measures in the event that such visible dust plumes are observed:

Step 1: The AQCMM or Delegate shall direct more intensive application of the existing mitigation methods within 15 minutes of making such a determination.

Step 2: The AQCMM or Delegate shall direct implementation of additional methods of dust suppression if Step 1, specified above, fails to result in adequate mitigation within 30 minutes of the original

determination.

Step 3: The AQCMM or Delegate shall direct a temporary shutdown of the activity causing the emissions if Step 2, specified above, fails to result in effective mitigation within one hour of the original determination. The activity shall not restart until the AQCMM or Delegate is satisfied that appropriate additional mitigation or other site conditions have changed so that visual dust plumes will not result upon restarting the shutdown source. The owner/operator may appeal to the CPM any directive from the AQCMM or Delegate to shut down an activity, if the shutdown shall go into effect within one hour of the original determination, unless overruled by the CPM before that time.

Verification: The AQCMM shall provide the CPM a Monthly Compliance Report to include:

A. a summary of all actions taken to maintain compliance with this Condition;

B. copies of any complaints filed with the District in relation to project construction; and

C. any other documentation deemed necessary by the CPM or AQCMM to verify compliance with this Condition. Such information may be provided via electronic format or disk at the project owner's discretion.

AQ-SC5 Diesel-Fueled Engine Control: The AQCMM shall submit to the CPM, in the Monthly Compliance Report, a construction mitigation report that demonstrates compliance with the AQCMP mitigation measures for purposes of controlling diesel construction-related emissions. The following off-road diesel construction equipment mitigation measures shall be included in the Air Quality Construction Mitigation Plan (AQCMP) required by **AQ-SC2,** and any deviation from the AQCMP mitigation measures shall require prior CPM notification and approval.

a. All diesel-fueled engines used in the construction of the facility shall have clearly visible tags issued by the on-site AQCMM showing that the engine meets the conditions set forth herein.

b. All construction diesel engines with a rating of 50 hp or higher shall meet, at a minimum, the Tier 3 California Emission Standards for Off-Road Compression-Ignition Engines, as specified in California Code of Regulations, Title 13, section 2423(b)(1), unless a good faith effort to the satisfaction of the CPM that is certified by the on-site AQCMM demonstrates that such engine is not available for a particular item of equipment. In the event that a Tier 3 engine is not available for any off-road equipment larger than 50 hp, that equipment shall be equipped with a Tier 2 engine, or an engine that is equipped with retrofit controls to reduce exhaust emissions of nitrogen oxides (NOX) and diesel particulate matter (DPM) to no more than Tier 2 levels unless certified by engine manufacturers or the on-site AQCMM that the use of such devices is

not practical for specific engine types. For purposes of this Condition, the use of such devices is "not practical" for the following, as well as other, reasons.

1. There is no available retrofit control device that has been verified by either the California Air Resources Board or U.S. Environmental Protection Agency to control the engine in question to Tier 2 equivalent emission levels and the highest level of available control using retrofit or Tier 1 engines is being used for the engine in question; or
2. The construction equipment is intended to be on site for 10 days or less.
3. The CPM may grant relief from this requirement if the AQCMM can demonstrate a good faith effort to comply with this requirement and that compliance is not practical.

c. The use of a retrofit control device may be terminated immediately, provided that the CPM is informed within 10 working days of the termination and that a replacement for the equipment item in question meeting the controls required in item "b" occurs within 10 days of termination of the use, if the equipment would be needed to continue working at this site for more than 15 days after the use of the retrofit control device is terminated, if one of the following conditions exists :

1. The use of the retrofit control device is excessively reducing the normal availability of the construction equipment due to increased down time for maintenance, and/or reduced power output due to an excessive increase in back pressure.
2. The retrofit control device is causing or is reasonably expected to cause engine damage.
3. The retrofit control device is causing or is reasonably expected to cause a substantial risk to workers or the public.
4. Any other seriously detrimental cause which has the approval of the CPM prior to implementation of the termination.

d. All heavy earth-moving equipment and heavy-duty construction-related trucks with engines meeting the requirements of (b) above All diesel heavy construction equipment shall not idle for more than five minutes. Vehicles that need to idle as part of their normal operation (such as concrete trucks) are exempted from this requirement.

e. Construction equipment will employ electric motors when feasible.

Verification: The AQCMM shall include in the Monthly Compliance Report the following to demonstrate control of diesel construction-related emissions:

A. A summary of all actions taken to control diesel construction related emissions;

B. A list of all heavy equipment used on site during that month, including the owner

of that equipment and a letter from each owner indicating that equipment has been properly maintained; and

C. Any other documentation deemed necessary by the CPM, or the AQCMM to verify compliance with this Condition. Such information may be provided via electronic format or disk at the project owner's discretion.

AQ-SC6 The project owner, when obtaining dedicated on-road or off-road vehicles for mirrorand PV panel washing activities and other facility maintenance activities, shall only obtain vehicles that meet California on-road vehicle emission standards or appropriate U.S.EPA/California off-road engine emission standards for the latest model year available when obtained.

Verification: At least 30 days prior to the start of commercial operation, the project owner shall submit to the CPM a copy of the plan that identifies the size and type of the on-site vehicle and equipment fleet and the vehicle and equipment purchase orders and contracts and/or purchase schedule. The plan shall be updated every other year and submitted in the Annual Compliance Report.

AQ-SC7 The project owner shall provide a site Operations Dust Control Plan, including all applicable fugitive dust control measures identified in the verification of **AQ-SC3** that would be applicable to minimizing fugitive dust emission creation from operation and maintenance activities and preventing all fugitive dust plumes that would not comply with the performance standards identified in **AQ-SC4** from leaving the project site; that:

A. describes the active operations and wind erosion control techniques such as windbreaks and chemical dust suppressants, including their ongoing maintenance procedures, that shall be used on areas that could be disturbed by vehicles or wind anywhere within the project boundaries; and

B. identifies the location of signs throughout the facility that will limit traveling on unpaved portion of roadways to solar equipment maintenance vehicles only. In addition, vehicle speed shall be limited to no more than 10 miles per hour on these unpaved roadways, with the exception that vehicles may travel up to 25 miles per hour on stabilized unpaved roads as long as such speeds do not create visible dust emissions.

The site operations fugitive dust control plan shall include the use of durable non-toxic soil stabilizers on all regularly used unpaved roads and disturbed off-road areas, or alternative methods for stabilizing disturbed off-road areas, within the project boundaries, and shall include the inspection and maintenance procedures that will be undertaken to ensure that the unpaved roads remain stabilized. The soil stabilizer used shall be a non-toxic soil stabilizer or soil weighting agent that can be determined to be either as efficient or more efficient for fugitive dust control as ARB approved soil stabilizers, and shall not increase any other environmental impacts including loss of vegetation to areas beyond where the soil stabilizers are being applied for dust control.

The performance and application of the fugitive dust controls shall also be measured against and meet the performance requirements of condition **AQ-SC4.** The measures and performance requirements of **AQ-SC4** shall also be included in the operations dust control plan.

Verification: At least 30 days prior to start of commercial operation, the project owner shall submit to the CPM for review and approval a copy of the site Operations Dust Control Plan that identifies the dust and erosion control procedures, including effectiveness and environmental data for the proposed soil stabilizer, that will be used during operation of the project and that identifies all locations of the speed limit signs.

Within 60 days after commercial operation, the project owner shall provide to the CPM a report identifying the locations of all speed limit signs, and a copy of the project employee and contractor training manual that clearly identifies that project employees and contractors are required to comply with the dust and erosion control procedures and on-site speed limits.

AQ-SC8 The project owner shall provide the CPM copies of all District issued Authority-to-Construct (ATC) and Permit-to-Operate (PTO) documents for the facility.

The project owner shall submit to the CPM for review and approval any modification proposed by the project owner to any project federal air permit. The project owner shall submit to the CPM any modification to any permit proposed by the District or U.S. Environmental Protection Agency (U.S. EPA), and any revised federal permit issued by the District or U.S. EPA, for the project.

Verification: The project owner shall submit any ATC, PTO, and proposed federal air permit modifications to the CPM within five working days of its submittal either by 1) the project owner to an agency, or 2) receipt of proposed modifications from an agency. The project owner shall submit all modified ATC/PTO documents and all federal air permits to the CPM within 15 days of receipt.

AQ-SC9 The project owner shall only use Tier 3 or higher certified engine generators, totaling no more than 900 horsepower, to provide project site power prior to the installation of utility construction or permanent electric power lines to the project site. These engines shall be in the range of 50 to 750 hp each and will have NOx emissions that are certified under full load to be no more than 3.5 grams per brake horsepower for engines between 50 and 100 horsepower and no more than 3.0 grams per brake horsepower for engines between 100 and 750 horsepower. This requirement does not include small engine generators that are solely dedicated to specific pieces of equipment, such as engine generators necessary for welders.

Verification: The project owner shall submit data on the site power generators, at least 15 days prior to their use, that demonstrates compliance with this condition.

DISTRICT CONDITIONS

DISTRICT FINAL DETERMINATION OF COMPLIANCE CONDITIONS (MDAQMD 2010a)

District conditions **AQ-1** through **AQ-15** are CEQA-only required Conditions.

Application No, 000010423 (Emergency Generator)

EQUIPMENT DESCRIPTION:

ARB Certified III engine, 399 bhp, fueled on ARB diesel, powering an electrical generator.

AQ-1 The emergency generator engine may operate in response to notification of impending rotating outage if the area utility has ordered rotating outages in the area where the engine is located or expects to order such outages at a particular time, the engine is located in the area subject to the rotating outage, the engine is operated no more than 30 minutes prior to the forecasted outage, and the engine is shut down immediately after the utility advises that the outage is no longer imminent or in effect.

Verification: The project owner shall maintain emergency generator engine operating records as required in **AQ-6** and shall make the site available for inspection of records by representatives of the District, ARB, and the Energy Commission.

AQ-2 The emergency generator engine shall only be fired on ultra-low sulfur diesel fuel, whose sulfur concentration is less than or equal to 0.0015 percent (15 ppm) on a weight per weight basis per ARB Diesel or equivalent requirements.

Verification: The project owner shall maintain the fuel sulfur content records for diesel fuel deliveries on site as required in **AQ-6** and shall make the site available for inspection of records by representatives of the District, ARB, and the Energy Commission.

AQ-3 The emergency generator engine shall be installed, operated and maintained in strict accord with those recommendations of the manufacturer/supplier and/or sound engineering principles which produce the minimum emissions of contaminants. Unless otherwise noted, the engine shall also be operated in accordance with all data and specifications submitted with the application for this permit.

Verification: The project owner shall make the site available for inspection of records by representatives of the District, ARB, and the Energy Commission.

AQ-4 A non-resettable four-digit (9,999) hour timer shall be installed and maintained on the emergency generator engine to indicate elapsed engine operating time.

Verification: The project owner shall make the site available for inspection by representatives of the District, ARB, and the Energy Commission.

AQ-5 The project shall be allowed to utilize the emergency generator engine until the project receives permanent power from SCE. Once permanent power has been supplied, the emergency generator engine shall be limited to use for emergency power, defined as in response to a fire or when commercially available power has been interrupted. In addition, the engine shall be operated no more than 50 hours per year, and no more than 0.5 hours per day for testing and maintenance, excluding compliance source testing. Time required for source testing will not be counted toward the 50 hour per year limit.

Verification: The project owner shall maintain engine use records on site as required in **AQ-6** and shall make the site available for inspection of records by representatives of the District, ARB, and the Energy Commission.

AQ-6 The project owner shall maintain an operations log for the emergency generator engine current and on-site (or at a central location) for a minimum of five years, and this log shall be provided to District, State and Federal personnel upon request. The log shall include, at a minimum, the information specified below:

a. Date of each use and duration of each use (in hours);

c. Reason for use (testing & maintenance, emergency, required emission testing); Calendar year operation in terms of fuel consumption (in gallons) and total hours; and,

d. Fuel sulfur concentration (the project owner may use the supplier's certification of sulfur content if it is maintained as part of this log).

Verification: The project owner shall submit records required by this Condition that demonstrating compliance with the sulfur content and engine use limitations of Conditions **AQ-2** and **AQ-5** in the Annual Compliance Report (**COMPLIANCE-8),** including a photograph showing the annual reading of engine hours. The project owner shall make the site available for inspection of records by representatives of the District, ARB, and the Energy Commission.

AQ-7 This gen-set is subject to the requirements of the Airborne Toxic Control Measure (ATCM) for Stationary Compression Ignition Engines (Title 17 CCR 93115). In the event of conflict between these Conditions and the ATCM, the more stringent requirements shall govern.

Verification: The project owner shall submit the engine specifications at least 30 days prior to purchasing the engines for review and approval demonstrating that the engines meet both ATCM and New Source Performance Standard (NSPS) subpart IIII emission limit requirements at the time of engine purchase. The project owner shall make the site available for inspection of records by representatives of the District, ARB, and the Energy Commission.

AQ-8 The emergency generator engine shall not be used to provide power during a voluntary agreed to power outage and/or power reduction initiated under an Interruptible Service Contract (ISC); Demand Response Program (DRP);

Load Reduction Program (LRP) and/or similar arrangement(s) with the electrical power supplier.

Verification: The project owner shall make the site available for inspection of records by representatives of the District, ARB, and the Energy Commission.

Application No. 00010422 (5,000 gallon Above Ground Non-Retail Gasoline Dispensing Facility)

EQUIPMENT DESCRIPTION:

5,000 gallon capacity gasoline tank with Phase I and Phase II vapor recovery.

AQ-9 The toll-free telephone number that must be posted is 1 -800-635-4617.

Verification: The project owner shall make the site available for inspection of records by representatives of the District, ARB, and the Energy Commission.

AQ-10 The project owner shall maintain a log of all inspections, repairs, and maintenance on equipment subject to Rule 461. Such logs or records shall be maintained at the facility for at least two years and shall be available to the District upon request.

Verification: The project owner shall make the site available for inspection of records by representatives of the District, ARB, and the Energy Commission.

AQ-11 Any modifications or changes to the piping or control fitting of the vapor recovery system require prior approval from the District.

Verification: The project owner shall make the site available for inspection of records by representatives of the District, ARB, and the Energy Commission.

AQ-12 The vapor vent pipes are to be equipped with pressure relief valves.

Verification: The project owner shall make the site available for inspection of records by representatives of the District, ARB, and the Energy Commission.

AQ-13 The project owner shall perform the following tests in accord with the following test procedures:

a. Static Pressure Decay Test per ARB test method TP-201 .3B (2-inch test);

b. Dynamic Back Pressure test per TP-201 .4;

c. Liquid Removal Test (if applicable) per TP-201 .6;

d. Fuel dispensing rate not to exceed 10 gpm, verified per EO G-70-200-C Exhibit 4, and;

e. Emergency vents and manways shall be leak free when tested at the operating pressure of the tank in accordance with ARB test methods, as specified in Title 17, California Code of Regulations.

Verification: Within 60 days of completion of project construction and annually

thereafter, the project owner shall notify the District at least 10 days prior to performing the required tests. The test results shall be submitted to the District within 30 days of completion of the tests and shall be made available to the CPM if requested. The District shall receive passing test reports no later than six weeks prior to the expiration date of this permit.

AQ-14 The annual throughput of gasoline shall not exceed 500,000 gallons per year. Throughput Records shall be kept on site and available to District personnel upon request. Before this annual throughput can be increased the facility may be required to submit to the District a site specific Health Risk Assessment in accord with a District approved plan. In addition public notice and/or comment period may be required.

Verification: The project owner shall submit to the CPM gasoline throughput records demonstrating compliance with this Condition as part of the Annual Compliance Report .The project owner shall maintain on site the annual gasoline throughput records and shall make the site available for inspection of records by representatives of the District, ARB, and the Energy Commission.

AQ-15 The project owner shall; install, maintain, and operate this equipment in compliance with ARB Executive Order G-70-200-C or Enhanced Vapor Recovery (EVR) Phase I and EVR Phase II, and Standing Loss requirements in affect at the time of construction.

Verification: The project owner shall make the site available for inspection of records by representatives of the District, ARB, and the Energy Commission.

WORKER SAFETY-1 The project owner shall submit to the Compliance Project Manager (CPM) a copy of the Project Construction Safety and Health Program containing the following:

- A Construction Personal Protective Equipment Program;
- A Construction Exposure Monitoring Program;
- A Construction Injury and Illness Prevention Program;
- A Construction heat stress protection plan that implements and expands on existing Cal OSHA regulations as found in 8 CCR 3395;
- A Construction Emergency Action Plan; and
- A Construction Fire Prevention Plan.

The Personal Protective Equipment Program, the Exposure Monitoring, the Personal Protective Equipment Program, the Exposure Monitoring Program, the Heat Stress Protection Plan, and the Injury and Illness Prevention Program shall be submitted to the CPM for review and approval of compliance of the program with all applicable safety orders. These plans shall include programs to prevent exposure of workers to the unusual hazard of high intensity reflected light from the solar parabolic mirrors. The Construction Emergency Action Plan and the Fire Prevention Plan shall be submitted to the San Bernardino County Fire Department for review and comment prior to submittal to the CPM for approval.

Verification: At least 30 days prior to the start of Pre-Construction Site Mobilization, the project owner shall submit to the CPM for review and approval a copy of the Project Construction Safety and Health Program. The project owner shall provide a copy of a letter to the CPM from the San Bernardino County Fire Department with the fire department's comments on the Construction Fire Prevention Plan and Emergency Action Plan.

WORKER SAFETY-2 The project owner shall submit to the CPM a copy of the Project Operations and Maintenance Safety and Health Program containing the following:

- An Operation Injury and Illness Prevention Plan;
- An Operation heat stress protection plan that implements and expands on existing Cal OSHA regulations (8 CCR 3395);
- A Best Management Practices (BMP) for the storage and application of herbicides;
- An Emergency Action Plan;
- Hazardous Materials Management Program;
- Fire Prevention Program (8 CCR § 3221); and;
- Personal Protective Equipment Program (8 CCR §§ 3401- 3411).

The Operation Injury and Illness Prevention Plan, Emergency Action Plan, the Heat Stress Protection Plan, BMP for Herbicides, and Personal

Protective Equipment Program shall be submitted to the CPM for review and approval concerning compliance of the programs with all applicable safety orders. These plans shall include programs to prevent exposure of workers to the unusual hazard of high intensity reflected light from the solar parabolic mirrors. The Fire Prevention Plan and the Emergency Action Plan shall address special precautions and responses to implement when a fire involves a SunCatcher or hydrogen piping located within 200 feet of a fence line where a public access road exists directly on the other side of the fence. The Fire Prevention Plan and Emergency Action Plan shall also be submitted to the San Bernardino County Fire Department and the BNSF railroad for review and comment.

Verification: At least 30 days prior to the start of commercial operation, the project owner shall submit to the CPM for approval a copy of the Project Operations and Maintenance Safety and Health Program.

WORKER SAFETY-3 The project owner shall provide a site Construction Safety Supervisor (CSS) who, by way of training and/or experience, is knowledgeable of power plant construction activities and relevant laws, ordinances, regulations, and standards, is capable of identifying workplace hazards relating to the construction activities, and has authority to take appropriate action to assure compliance and mitigate hazards. The CSS shall:

- Have overall authority for coordination and implementation of all occupational safety and health practices, policies, and programs;
- Assure that the safety program for the project complies with Cal/OSHA and federal regulations related to power plant projects;
- Assure that all construction and commissioning workers and supervisors receive adequate safety training;
- Complete accident and safety-related incident investigations, emergency response reports for injuries, and inform the CPM of safety-related incidents; and
- Assure that all the plans identified in **Worker Safety-1** and **2** are implemented.

Verification: At least 30 days prior to the start of Pre-Construction Site Mobilization, the project owner shall submit to the CPM the name and contact information for the CSS. The contact information of any replacement CSS shall be submitted to the CPM within one business day.

The CSS shall submit in the Annual Compliance Report documentation of monthly safety inspection reports to include:

- Record of all employees trained for that month (all records shall be kept on site for the duration of the project);
- Summary report of safety management actions and safety-related incidents that occurred during the month;
- Report of any continuing or unresolved situations and incidents that

may pose danger to life or health; and

- Report of accidents and injuries that occurred during the month.

WORKER SAFETY-4 The project owner shall make payments to the Chief Building Official (CBO) for the services of a Safety Monitor based upon a reasonable fee schedule to be negotiated between the project owner and the CBO. Those services shall be in addition to other work performed by the CBO. The Safety Monitor shall be selected by and report directly to the CBO, and will be responsible for verifying that the Construction Safety Supervisor, as required in **Worker Safety-3,** implements all appropriate Cal/OSHA and Commission safety requirements. The Safety Monitor shall conduct on-site (including linear facilities) safety inspections at intervals necessary to fulfill those responsibilities.

Verification: At least 30 days prior to the start of Pre-Construction Site Mobilization, the project owner shall provide proof of its agreement to fund the Safety Monitor services to the CPM for review and approval.

WORKER SAFETY-5 The project owner shall ensure that two or more portable automatic external defibrillators (AEDs) are located on site during construction and operations and shall implement a program to ensure that workers are properly trained in its use and that the equipment is properly maintained and functioning at all times. During construction and commissioning, the following persons shall be trained in its use and shall be on-site whenever the workers that they supervise are on-site: the Construction Project Manager or delegate, the Construction Safety Supervisor or delegate, and all shift foremen. During operations, all power plant employees shall be trained in its use. The training program shall be submitted to BLM's authorized officer and the CPM for review and approval.

Verification: At least 30 days prior to the start of Pre-Construction Site Mobilization the project owner shall submit to BLM's authorized officer and the CPM proof that a portable AED exists on site and a copy of the training and maintenance program for review and approval.

WORKER SAFETY-6 The project owner shall:

a. Provide secondary access gates for emergency personnel to enter the southern and northern portions of the site. These secondary access gates shall be at least one-quarter mile from the primary access points and may be restricted to emergency response personnel.

b. Provide a second access road or roads that serve both the northern portion of the site and the southern portion of the site. This road(s) shall be treated with Soiltac or its equivalent with 80 percent compaction, at least 20 feet wide. The secondary emergency access road may cross the BNSF tracks at an at-grade crossing.

c. Maintain the main access road and the secondary access roads and

provide a plan for implementation.

d. Provide funding for a gate (with a lock allowing emergency response access), posting to direct emergency responders to notify BNSF operations before crossing, telephone box to allow BNSF notification at the at-grade crossing of the BNSF rail line on the secondary access road, and any road improvements required by the San Bernardino County Fire Department.

e. Provide an at-grade crossing of the BNSF tracks between the southern and northern portions of the site and provide funding for a gate (with a lock allowing emergency response access), posting to direct emergency responders to notify BNSF, a telephone box to allow for notification to BNSF by emergency responders when using the secondary access road, and any road improvements near the crossing recommended by the SBCFD.

Plans for the secondary access gates, the method of gate operation, secondary emergency access road(s), the above-grade crossing, and to maintain the roads shall be submitted to the San Bernardino County Fire Department for review and comment and to the CPM for review and approval.

Verification: At least 30 days prior to the start of Pre-Construction Site Mobilization, the project owner shall submit to the San Bernardino County Fire Department and the CPM preliminary plans showing the location and dimensions of the secondary access gates to both the southern and northern portions of the site, a description of how the gates will be opened by the fire department, and a description and map showing the location, dimensions, and composition of the main road, location of the secondary emergency access road(s) to the southern and northern portions of the site, and the engineering drawings and precise location of the above-grade crossing structure.

At least 15 days prior to the start of Pre-Construction Site Mobilization, the project owner shall submit final plans plus the road maintenance plan to the CPM review and approval. The final plan submittal shall also include a letter containing comments from the San Bernardino County Fire Department or a statement that no comments were received.

WORKER SAFETY-7 The project owner shall either:

(1) Reach an agreement with the San Bernardino County Fire Department (SBCFD) regarding funding of its project-related share of capital and operating costs to build and operate new fire protection/response infrastructure and provide appropriate equipment as mitigation of project-related impacts on fire protection services within the jurisdiction.

or

(2) The project owner shall fund a Fire Needs Assessment and Risk Assessment conducted by an independent contractor who shall

be selected and approved by the CEC Compliance Project Manager (CPM) and fulfill all mitigation identified in the independent fire needs assessment and a risk assessment. The Fire Needs Assessment must address emergency response and equipment, staffing, and location needs while the Risk Assessment must be used to establish the risk (chances) of significant impacts occurring.

Should the Project owner pursue option (2), above, the Fire Needs Assessment and Risk Assessment shall evaluate the following:

(a) The risk of impact on the local population that could result from potential unmitigated impacts on local fire protection and emergency services (i.e. "drawdown" of emergency response resources);

(b) The extent that the project's exemption from local taxes will impact local fire protection and emergency response services; and

(c) Recommend an amount of funding that should be provided to mitigate any identified significant impacts on local fire protection and emergency response services.

Compliance Protocols for the Fire Needs Assessment and Risk Assessment shall be as follows:

(a) The study shall be conducted by an independent consultant approved by the CPM. The project owner shall provide the CPM with the names of at least three consultants, whether entities or individuals, from which to make a selection, together with statements of qualifications. The CPM shall approve one of the three proffered consultants;

(b) The Fire Needs Assessment and Risk Assessment shall be fully funded by the project owner. The independent consultant(s) preparing the Fire Needs Assessment and Risk Assessment shall work directly for the Energy Commission;

(c) The project owner shall provide the protocols for conducting the independent fire needs assessment for review and comment by the SBCFD and review and approval by the CPM prior to the independent consultant's commencement of the fire needs assessment;

(d) The CPM shall be copied in any correspondence including emails or letters and included in any conversations between the project owner and consultant; and

(e) The CPM shall verify that the Fire Needs Assessment and Risk Assessment are prepared consistent with the approved fire needs assessment protocols and a risk assessment protocols.

Plant operation shall not occur until funding of mitigation occurs either (i) pursuant to an agreement reached between the project owner and the SBCFD, or (ii) pursuant to the independent Fire Needs and Risk Assessments conducted by an independent consultant approved by the CPM or (iii) as determined by the Energy Commission or its designee if the project owner and SBCFD do not agree to the recommendations of the

independent consultant's study. The Energy Commission or its designee shall, based on the results of the study and comments from the project owner and SBCFD, make the final determination regarding the funding to be provided to the SBCFD to accomplish the above-identified mitigation.

Verification: If Option 1 of Condition of Certification **WORKER SAFETY-7** is fulfilled prior to plant operation, then the project owner shall provide to the CPM a copy of the individual agreement with the SBCFD. If option 2 of Condition of Certification **WORKER SAFETY-7** is selected, then prior to plant operation the project owner shall provide to the CPM a protocol, scope and schedule of work for the independent Fire Needs Assessment and Risk Assessment and the qualifications of proposed contractor(s) for review and approval by the CPM; a copy of the completed Fire Needs Assessment and Risk Assessment showing the precise amount the project owner shall pay for mitigation; and documentation that the amount has been paid. If the Energy Commission or its designee establishes the payment amount, then prior to plant operation, the project owner shall provide the CPM with a copy of the order or decision and documentation establishing that the amount has been paid.

Annually thereafter, the owner shall provide the CPM with verification of funding to the San Bernardino County Fire Department for required fire protection services mitigation pursuant to the agreement with the Fire Department or the CPM approved independent fire needs assessment.

WORKER SAFETY-8 In the event that the project owner has not satisfied the conditions set forth in **WORKER SAFETY-7** by the time the project owner, in consultation with the CPM, determines construction must commence, the project owner shall pay to SBCFD (a) $$_____ ((____ acres x $____ per acre) prior to the start of construction for Phase 1; and (cb) $_____ (_____ acres x $____ per acre) prior to the start of construction for Phase 2. This funding shall off-set any initial funding required by **WORKER SAFETY-7** above until the funds are exhausted. This offset will be based on a full accounting by the SBCFD regarding the use of these funds.

Verification: At least 10 days prior to Pre-Construction Site Mobilization for Phase1 and Phase 2, respectively, the project owner shall provide to the CEC CPM either:

a. documentation that the payment described above has been made; **or**

b. that payment has been made pursuant to a contractual agreement with the SBCFD.

The CEC CPM shall adjust any payments initially required by **WORKER SAFETY-7** based upon the accounting provided by the SBCFD.

WORKER SAFETY-9 The project owner shall develop and implement an enhanced Dust Control Plan that includes the requirements described in **AQ-SC3** and additionally requires:

i. site worker use of dust masks (NIOSH N-95 or better) whenever visible dust is present;

ii. implementation of methods equivalent to Rule 402 of the Kern County Air Pollution Control District (as amended Nov. 3, 2004); and

iii. implementation of enhanced dust control methods (increased frequency of watering, use of dust suppression chemicals, etc. consistent with **AQ-SC4** immediately whenever visible dust comes from or onto the site or when PM10 measurements obtained when implementing ii (above) exceed 50 $\mu g/m^3$.

Verification: At least 30 days prior to Pre-Construction Site Mobilization, the enhanced Dust control Plan shall be provided to the CPM for review and approval.

HAZ-1 The project owner shall not use any hazardous materials not listed in **Appendix A,** below, or in greater quantities than those identified by chemical name in **Appendix A,** unless approved in advance by the Compliance Project Manager (CPM). Appendix A may be amended at any time with CPM approval.

Verification: The project owner shall provide to the CPM in the Annual Compliance Report, a list of hazardous materials contained at the facility.

HAZ-2 If required under applicable LORS, the project owner shall concurrently provide a Hazardous Materials Business Plan (HMBP), a Risk Management Plan (RMP) that includes the consequences of a train derailment resulting in a hydrogen pipeline leak and fire, and a Spill Prevention, Control, and Countermeasure Plan (SPCC) to the San Bernardino County Fire Department, and the CPM for review. After receiving comments from the San Bernardino County Fire Department, and the CPM, the project owner shall reflect all received recommendations in the final documents. If no comments are received from the county within 30 days of submittal, the project owner may proceed with preparation of final documents upon receiving comments from the CPM. Copies of the final HMBP, RMP, and SPCC Plan shall then be provided to the San Bernardino County Fire Department for their records and to the CPM for approval.

Verification: At least 60 days prior to receiving any hazardous material on the site for commissioning or operations, the project owner shall provide a copy of a final Hazardous Materials Business Plan (HMBP) and a Spill Prevention, Control, and Countermeasure Plan (SPCC) to the CPM for approval, as required. At least 60 days prior to existence of any hydrogen on the site for commissioning or operations, the project owner shall provide a copy of a final Risk Management Plan (RMP) to the CPM for approval, as required.

HAZ-3 The project owner shall develop and implement a Safety Management Plan for delivery of liquid and gaseous hazardous materials. The plan shall include procedures, protective equipment requirements, training and a checklist. It shall also include a section describing all measures to be implemented to prevent mixing of incompatible hazardous materials. This plan shall be applicable during construction, commissioning, and operation of the power plant.

Verification: At least 60 days prior to the delivery of any liquid or gaseous hazardous material to the facility, the project owner shall provide a Safety Management Plan as described above to the CPM for review and approval.

HAZ-4 A site-specific Construction Site Security Plan for the construction phase shall be prepared and made available to BLM's authorized officer and the CPM for review and approval. The Construction Security Plan shall include the following:

1. Perimeter security consisting of fencing enclosing the construction area;
2. Security guards;

3. Site access control consisting of a check-in procedure or tag system for construction personnel and visitors;
4. Written standard procedures for employees, contractors and vendors when encountering suspicious objects or packages on-site or off-site;
5. Protocol for contacting law enforcement and the CPM in the event of suspicious activity or emergency; and
6. Evacuation procedures.

Verification: At least 30 days prior to start of Pre-Construction Site Mobilization, the project owner shall notify the CPM that a site-specific Construction Security Plan is available for review and approval.

HAZ-5 The project owner shall prepare a site-specific Security Plan for the operational phase and shall be made available to the CPM for review and approval. The project owner shall implement site security measures addressing physical site security and hazardous materials storage. The level of security to be implemented shall not be less than that described below (as per NERC 2002).

The Operation Security Plan shall include the following:

1. Permanent full perimeter fence, at least 8 feet high around the Solar Field;
2. Main entrance security gate, either hand operable or motorized;
3. Evacuation procedures;
4. Protocol for contacting law enforcement and the CPM in the event of suspicious activity or emergency;
5. Written standard procedures for employees, contractors and vendors when encountering suspicious objects or packages on-site or off-site;
6. If an RMP is required under HAZ-2,
   a. a statement (refer to sample, attachment "A") signed by the project owner certifying that background investigations have been conducted on all operational project personnel hired by project owner. Background investigations shall be restricted to ascertain the accuracy of employee identity and employment history, and shall be conducted in accordance with state and federal law regarding security and privacy;
   b. a statement(s) (refer to sample, attachment "B") signed by the contractor or authorized representative(s) for any permanent contractors or other technical contractors (as determined by the CPM after consultation with the project owner) that are present at any time on the site to repair, maintain, investigate, or conduct any other technical duties involving critical components (as determined by the CPM after consultation with the project owner) certifying that background investigations have been conducted on contractor personnel that visit the project site.
7. Site access controls for employees, contractors, vendors, and visitors;

8. Closed circuit TV (CCTV) monitoring system, recordable, and viewable in the power plant control room and security station (if separate from the control room) with cameras able to pan, tilt, and zoom, have low-light capability, and are able to view the outside entrance to the control room, the hydrogen generator location, the front gate and emergency access gate(s), and all security fence that directly abuts the public access road; and
9. Additional measures to ensure adequate perimeter security consisting of either:
   a. Security guard present 24 hours per day, 7 days per week, **OR**
   b. Power plant personnel on-site 24 hours per day, 7 days per week and **one** of the following:

      Perimeter breach detectors; **or** CCTV able to view both site entrance gates and 100 percent of the power block area perimeter

   The project owner shall fully implement the security plans and obtain CPM approval of any substantive modifications to the security plans. The CPM may authorize modifications to these measures, or may require additional measures, such as protective barriers for critical power plant components or cyber security depending on circumstances unique to the facility or in response to industry-related standards, security concerns, or additional guidance provided by the U.S. Department of Homeland Security, the U.S. Department of Energy, or the North American Electrical Reliability Council, after consultation with appropriate law enforcement agencies and the project owner.

Verification: At least 30 days prior to the initial receipt of hazardous materials on-site, the project owner shall notify the CPM that a site-specific Operations Site Security Plan is available for review and approval. In the Annual Compliance Report, the project owner shall include a statement that all current project employee and appropriate contractor background investigations have been performed, and updated certification statements are appended to the Operations Security Plan. In the Annual Compliance Report, the project owner shall include a statement that the Operations Security Plan includes all current hazardous materials transport vendor certifications for security plans and employee background investigations.

HAZ-6 The holder (project owner) shall comply with all applicable Federal laws and regulations existing or hereafter enacted or promulgated. In any event, the holder(s) shall comply with the Toxic Substances Control Act of 1976, as amended (15 U.S.C. 2601, et seq.) with regard to any toxic substances that are used, generated by or stored on the right-of-way or on facilities authorized under this right-of-way grant. (See 40 CFR, Part 702-799 and especially, provisions on polychlorinated biphenyls, 40 CFR 761.1-761.193.) Additionally, any release of toxic substances (leaks, spills, etc.) in excess of the reportable quantity established by 40 CFR, Part 117 shall be reported as required by the Comprehensive Environmental Response, Compensation and Liability Act of 1980, Section 1 02b

Verification: A copy of any report required or requested by any Federal agency or State government as a result of a reportable release or spill of any toxic substances shall be furnished to the CPM concurrent with the filing of the reports to the involved Federal agency or State government.

HAZ-7 The project owner shall ensure that whichever of the two proposed hydrogen storage and handling systems is used in the project, the system is reviewed, evaluated by a Mechanical Engineer registered in California to ensure that it complies with all applicable ANSI, ASME, and NFPA design codes, and that the system is approved by this person as shown by applying a professional "stamp" to the document review page. No hydrogen will be transported over or under the BNSF mainline or through the BNSF right-of-way.

Verification: At least 30 days prior to the existence of stored hydrogen on site, the project owner shall provide to the CPM for review and approval a copy of design drawings, documentation, and specifications of the hydrogen storage and handling system that has been reviewed, evaluated, approved, and stamped by a Mechanical Engineer registered in the state of California.

HAZ-8 If required under applicable LORS, the project owner shall:

a. Conduct a process hazard analysis and prepare a Process Safety Management Plan (PSM Plan) that contains a hazard analysis, including for rail operations using a Hazard and Operability Study (HAZOP) for the hydrogen system.

b. Retain an independent outside third party group of professionals to provide peer review and approval of the process hazard analysis and the PSM plan before they are submitted to the CPM. The outside third party shall have expertise in engineering and process operations, shall include at least one member who has experience and knowledge specific to the processes being evaluated, and shall also include one member knowledgeable in the specific process hazard analysis methodologies being used.

c. Ensure that the hydrogen compressor stations, piping connecting compressor stations and the piping between compressor stations and the hydrogen generator are at least 500 feet from the BNSF right-of-way.

d. Include in the hydrogen handling an automatic system for notification of BNSF operations of any loss of containment from the hydrogen system.

The final report containing the results of the hazard analysis, the final PSM Plan, and the review and approval of the outside third party shall be submitted to the San Bernardino County Fire Department for review and to the CPM for approval.

Verification: At least 30 days prior to receiving hydrogen gas on the site, the project owner shall provide, as required, a copy of a final hazard analysis, the final PSM Plan, and the review and approval of the outside third party to the CPM for approval.

WASTE-1 The project owner shall provide the resume of an experienced and qualified professional engineer or professional geologist, who shall be available during site characterization (if needed), demolition, excavation, and grading activities, to the CPM for review and approval. The resume shall show experience in remedial investigation and feasibility studies.

The professional engineer or professional geologist shall be given authority by the project owner to oversee any earth moving activities that have the potential to disturb contaminated soil and impact public health, safety and the environment.

Verification: At least 30 days prior to the start of Pre-Construction Site Mobilization , the project owner shall submit the resume to the CPM for review and approval.

WASTE-2 If potentially contaminated soil is identified during site characterization, demolition, excavation or grading at either the proposed site or linear facilities, as evidenced by discoloration, odor, detection by handheld instruments, or other signs, the professional engineer or professional geologist shall inspect the site, determine the need for sampling to confirm the nature and extent of contamination, and provide a written report to the project owner, representatives of Department of Toxic Substances Control or Regional Water Quality Control Board, and the CPM stating the recommended course of action.

Depending on the nature and extent of contamination, the professional engineer or professional geologist shall have the authority to temporarily suspend construction activity at that location for the protection of workers or the public. If in the opinion of the professional engineer or professional geologist, significant remediation may be required, the project owner shall contact the CPM and representatives of the Department of Toxic Substances Control or Regional Water Quality Control Board, for guidance and possible oversight.

Verification: The project owner shall submit any reports filed by the professional engineer or professional geologist to the CPM within five days of their receipt. The project owner shall notify the CPM within 24 hours of any orders issued to halt construction.

WASTE-3 The project owner shall prepare a Construction Waste Management Plan for all wastes generated during construction of the facility and shall submit the plan to the CPM for review and approval prior to the start of construction. The plan shall contain, at a minimum, the following:

- A description of all construction waste streams, including projections of frequency, amounts generated, and hazard classifications; and
- Management methods to be used for each waste stream, including temporary on-site storage, housekeeping and best management practices to be employed, treatment methods and companies providing

treatment services, waste testing methods to assure correct classification, methods of transportation, disposal requirements and sites, and recycling and waste minimization/source reduction plans.

Verification: The project owner shall submit the Construction Waste Management Plan to the CPM for approval no less than 30 days prior to the starts of Pre-Construction Site Mobilization.

WASTE-4 The project owner shall obtain a hazardous waste generator identification number from the United States Environmental Protection Agency (USEPA) prior to generating any hazardous waste during project construction and operations.

Verification: The project owner shall keep a copy of the identification number on file at the project site and provide documentation of the hazardous waste generation and notification and receipt of the number to the CPM in the next scheduled Monthly Compliance Report after receipt of the number. Submittal of the notification and issued number documentation to the CPM is only needed once unless there is a change in ownership, operation, waste generation, or waste characteristics that requires a new notification to USEPA. Documentation of any new or revised hazardous waste generation notifications or changes in identification number shall be provided to the CPM in the next scheduled compliance report.

WASTE-5 Upon notification of any impending waste management-related enforcement action by any local, state, or federal authority, the project owner shall notify the CPM of any such action taken or proposed against the project itself, or against any waste hauler or disposal facility or treatment operator with which the owner contracts, and describe how the violation will be corrected.

Verification: The project owner shall notify the CPM in writing within 10 days of becoming aware of an impending enforcement action. The CPM shall notify the project owner of any changes that will be required in the way project-related wastes are managed.

WASTE-6 The project owner shall provide a reuse/recycling plan for at least 50 percent of construction and demolition materials prior to any building or demolition. The project owner shall ensure compliance and shall provide proof of compliance documentation to the CPM, including a recycling and reuse summary report, receipts, and records of measurement. Project mobilization and construction shall not proceed until the CPM issues an approval document.

Verification: At least 60 days prior to the start of any construction or demolition activities, the project owner shall submit a reuse recycling plan to the CPM for review and approval. The project owner shall ensure that project activities are consistent with the approved reuse/recycling plan and provide adequate documentation of the types and volumes of wastes generated, how the wastes were managed, and volumes of wastes diverted. Project mobilization and construction shall not proceed until CPM issues an approval document. Not later than 60 days after completion of project

construction, the project owner shall submit documentation of compliance with the diversion program requirements to the CPM. The required documentation shall include a recycling and reuse summary report along with all necessary receipts and records of measurement from entities receiving project wastes.

WASTE-7 The project owner shall prepare an Operation Waste Management Plan for all wastes generated during operation of the proposed project and shall submit the plan to the CPM for review and approval. The plan shall contain, at a minimum, the following:

- A detailed description of all operation and maintenance waste streams, including projections of amounts to be generated, frequency of generation, and waste hazard classifications;
- Management methods to be used for each waste stream, including temporary on-site storage, housekeeping and best management practices to be employed, treatment methods and companies providing treatment services, waste testing methods to assure correct classification, methods of transportation, disposal requirements and sites, and recycling and waste minimization/source reduction plans;
- Information and summary records of conversations with the local Certified Unified Program Agency and the Department of Toxic Substances Control regarding any waste management requirements necessary for project activities. Copies of all required waste management permits, notices, and/or authorizations shall be included in the plan and updated as necessary;
- A detailed description of how facility wastes will be managed, and any contingency plans to be employed, in the event of an unplanned closure or planned temporary facility closure; and
- A detailed description of how facility wastes will be managed and disposed of upon closure of the facility.

Verification: The project owner shall submit the Operation Waste Management Plan to the CPM for approval no less than 30 days prior to the start of commercial operation. The project owner shall submit any required revisions to the CPM within 20 days of notification from the CPM that revisions are necessary.

The project owner shall also document in each Annual Compliance Report the actual volume of wastes generated and the waste management methods used during the year; provide a comparison of the actual waste generation and management methods used to those proposed in the original Operation Waste Management Plan; and update the Operation Waste Management Plan as necessary to address current waste generation and management practices.

WASTE-8 The project owner shall ensure that all spills or releases of hazardous substances, hazardous materials, or hazardous waste are documented and cleaned up and that wastes generated from the release/spill are properly managed and disposed of, in accordance with all applicable

federal, state, and local requirements.

Verification: The project owner shall document management of all unauthorized releases and spills of hazardous substances, hazardous materials, or hazardous wastes that occur on the project property or related linear facilities. The documentation shall include, at a minimum, the following information: location of release; date and time of release; reason for release; volume released; how release was managed and material cleaned up; amount of contaminated soil and/or cleanup wastes generated; if the release was reported; to whom the release was reported; release corrective action and cleanup requirements placed by regulating agencies; level of cleanup achieved and actions taken to prevent a similar release or spill; and disposition of any hazardous wastes and/or contaminated soils and materials that may have been generated by the release. A copy of the unauthorized release/spill documentation shall be provided to the CPM within 30 days of the date the release was discovered.

DESIGNATED BIOLOGIST SELECTION

BIO-1 The project owner shall assign at least one Designated Biologist to the project. The project owner shall submit the resume of the proposed Designated Biologist, with at least three references and contact information, to the Energy Commission Compliance Project Manager (CPM) and the Bureau of Land Management's (BLM's) Wildlife Biologist for approval in consultation with the California Department of Fish and Game (CDFG) and U.S. Fish and Wildlife Service (USFWS).

The Designated Biologist must meet the following minimum qualifications: Bachelor's degree in biological sciences, zoology, botany, ecology, or a closely related field;

1. Three years of experience in field biology or current certification of a nationally recognized biological society, such as The Ecological Society of America or The Wildlife Society;

2. Have at least one year of field experience with biological resources found in or near the project area;
3. Meet the current USFWS Authorized Biologist qualifications criteria (http://www.fws.gov/ventura/speciesinfo/protocols guidelines), demonstrate familiarity with protocols and guidelines for the desert tortoise, and be approved by the USFWS; and

4. Possess a California ESA Memorandum of Understanding pursuant to Section 208 1(a) for desert tortoise.

In lieu of the above requirements, the resume shall demonstrate to the satisfaction of BLM's Wildlife Biologist and the CPM, in consultation with CDFG and USFWS, that the proposed Designated Biologist or alternate has the appropriate training and background to effectively implement the conditions of certification.

Verification: No fewer than 30 days prior to Pre-Construction Site Mobilization, the Designated Biologist(s) shall complete a USFWS Desert Tortoise Authorized Biologist Request Form (http://www.fws.gov/ventura/speciesinfo/protocols guidelines) and submit it to the USFWS, BLM's Wildlife Biologist, and the CPM for review and final approval.

The project owner shall submit the resume of the Designated Biologist to the CPM and BLM 30 days prior to Pre-Construction Site Mobilization. No site mobilization activities such as installation of fencing, construction trailers, limited ground disturbance, such as grading and trenching associated with pre-construction activities shall commence until an approved Designated Biologist is available to be on site.

If a Designated Biologist needs to be replaced, the specified information of the proposed replacement must be submitted to BLM's Wildlife Biologist and the CPM as soon as possible prior to the termination or release of the Designated Biologist. In an emergency, the project owner shall immediately notify the BLM's Wildlife Biologist and

the CPM to discuss the qualifications and approval of a short-term replacement while a permanent Designated Biologist is proposed to BLM's Wildlife Biologist and the CPM and for consideration.

DESIGNATED BIOLOGIST DUTIES

BIO-2 The project owner shall ensure that the Designated Biologist performs the activities described below during any site mobilization activities, construction-related ground disturbance, grading, boring, or trenching activities. The Designated Biologist may be assisted by the approved Biological Monitor(s) but remains the contact for the project owner, BLM's Wildlife Biologist, and the CPM. The Designated Biologist Duties shall include the following:

1. Advise the project owner's Construction and Operation Managers on the implementation of the biological resources conditions of certification;

2. Consult on the preparation of the Biological Resources Mitigation Implementation and Monitoring Plan (BRM IMP) to be submitted by the project owner;

3. Be available to supervise, conduct, and coordinate mitigation, monitoring, and other biological resources compliance efforts, particularly in areas requiring avoidance or containing sensitive biological resources, such as special-status species or their habitat;

4. Clearly mark sensitive biological resource areas and inspect these areas at appropriate intervals for compliance with regulatory terms and conditions;

5. Inspect active construction areas where animals may have become trapped prior to construction commencing each day. At the end of the day, inspect for the installation of structures that prevent entrapment or allow escape during periods of construction inactivity. Periodically inspect areas with high vehicle activity (e.g., parking lots) for animals in harm's way;

6. Notify the project owner, the BLM's Wildlife Biologist and the CPM of any non-compliance with any biological resources condition of certification;

7. Respond directly to inquiries of BLM's Wildlife Biologist and the CPM regarding biological resource issues;

8. Maintain written records of the tasks specified above and those included in the BRMIMP. Summaries of these records shall be submitted in the Monthly Compliance Report and the Annual Compliance Report to both the CPM and BLM Wildlife Biologist;

9. Train the Biological Monitors as appropriate, and ensure their familiarity

with the BRMIMP, Worker Environmental Awareness Program (WEAP) training, and USFWS guidelines on desert tortoise surveys and handling procedures (http://www.fws.gov/ventura/speciesinfo/protocols guidelines); and

10. Maintain the ability to be in regular, direct communication with representatives of CDFG, USFWS, BLM's Wildlife Biologist, and the CPM, including notifying these agencies of dead or injured listed species and reporting special-status species observations to the California Natural Diversity Data Base.

Verification: The Designated Biologist shall provide copies of all written reports and summaries that document biological resources compliance activities in the Monthly Compliance Reports submitted to BLM's Wildlife Biologist and the CPM. If actions may affect biological resources during operation a Designated Biologist shall be available for monitoring and reporting. During project operation, the Designated Biologist shall submit record summaries in the Annual Compliance Report unless his or her duties cease, as approved by BLM's Wildlife Biologist and the CPM.

BIOLOGICAL MONITOR QUALIFICATIONS

BIO-3 The Designated Biologist shall submit the resume, at least three references, and contact information of each of the proposed Biological Monitors to BLM's Wildlife Biologist and the CPM. The resume shall demonstrate, to the satisfaction of the BLM's Wildlife Biologist and the CPM, the appropriate education and experience to accomplish the assigned biological resource tasks. The Biological Monitor is the equivalent of the USFWS designated Desert Tortoise Monitor (USFWS 2008c).

Biological Monitor(s) training by the Designated Biologist shall include familiarity with the conditions of certification, BRM IMP, WEAP, and USFWS guidelines on desert tortoise surveys and handling procedures (http://www.fws.gov/ventura/speciesinfo/protocols guidelines).

Verification: The project owner shall submit the specified information to the BLM's Wildlife Biologist and the CPM for approval at least 30 days prior to the Pre-Construction Site Mobilization. The Designated Biologist shall submit a written statement to BLM's Wildlife Biologist and the CPM confirming that individual Biological Monitor(s) has been trained including the date when training was completed. If additional biological monitors are needed during construction, the specified information shall be submitted to BLM's Wildlife Biologist and the CPM for approval at least 10 days prior to their first day of monitoring activities.

BIOLOGICAL MONITOR DUTIES

BIO-4 The Biological Monitors shall assist the Designated Biologist in conducting surveys and in monitoring of site mobilization activities, construction-related ground disturbance, grading, boring, or trenching. The Designated Biologist shall remain the contact for the project owner, BLM's Wildlife Biologist, and the

CPM.

Verification: The Designated Biologist shall submit in the Monthly Compliance Report to BLM's Wildlife Biologist and the CPM copies of all written reports and summaries that document biological resources compliance activities, including those conducted by Biological Monitors. If actions may affect biological resources during operations, a Biological Monitor under the supervision of the Designated Biologist, shall be available for monitoring and reporting. During project operation, the Designated Biologist shall submit record summaries in the Annual Compliance Report unless their duties cease, as approved by BLM's Wildlife Biologist and the CPM.

DESIGNATED BIOLOGIST AND BIOLOGICAL MONITOR AUTHORITY

BIO-5 The project owner's construction/operation manager shall act on the advice of the Designated Biologist and Biological Monitor(s) to ensure conformance with the biological resources conditions of certification. The Designated Biologist shall have the authority to immediately stop any activity that is not in compliance with these conditions and/or order any reasonable measure to avoid take of an individual of a listed species. If required by the Designated Biologist and/or Biological Monitor(s), the project owner's construction/operation manager shall halt all site mobilization, ground disturbance, grading, boring, trenching, and operation activities in areas specified. The Designated Biologist shall:

1. Require a halt to all activities in any area when determined that there would be an unauthorized adverse impact to biological resources if the activities continued;

2. Inform the project owner and the construction/operation manager when to resume activities; and

3. Notify BLM's Wildlife Biologist and the CPM if there is a halt of any activities and advise them of any corrective actions that have been taken or would be instituted as a result of the work stoppage.

4. If the Designated Biologist is unavailable for direct consultation, the Biological Monitor shall act on behalf of the Designated Biologist.

Verification: The project owner shall ensure that the Designated Biologist or Biological Monitor notifies BLM's Wildlife Biologist and the CPM immediately (and no later than the morning following the incident, or Monday morning in the case of a weekend) of any non-compliance or a halt of any site mobilization, ground disturbance, grading, construction, and operation activities. The project owner shall notify BLM's Wildlife Biologist and the CPM of the circumstances and actions being taken to resolve the problem.

Whenever corrective action is taken by the project owner, a determination of success or failure would be made by BLM's Wildlife Biologist and the CPM within five working days after receipt of notice that corrective action is completed, or the project owner would be

notified by BLM's Wildlife Biologist and the CPM that coordination with other agencies would require additional time before a determination can be made.

WORKER ENVIRONMENTAL AWARENESS PROGRAM (WEAP)

BIO-6 The project owner shall develop and implement a Project-specific Worker Environmental Awareness Program (WEAP) and shall secure approval for the WEAP from BLM's Wildlife Biologist and the CPM. The WEAP shall be administered to all onsite personnel including surveyors, construction engineers, employees, contractors, contractor's employees, supervisors, inspectors, subcontractors, and delivery personnel. The WEAP shall be implemented during site preconstruction, construction, operation, and closure. The WEAP shall:

1. Be developed by or in consultation with the Designated Biologist and consist of an on-site or training center presentation in which supporting written material and electronic media, including photographs of protected species, is made available to all participants;
2. Discuss the locations and types of sensitive biological resources on the project site and adjacent areas, and explain the reasons for protecting these resources; provide information to participants that no wildlife shall be harmed;
3. Place special emphasis on avoidance of desert tortoises, Mojave fringe-toed lizards, burrowing owls, golden eagles, nesting birds, badgers, and white-margined beardtongue, including information on physical characteristics, distribution, behavior, ecology, sensitivity to human activities, legal protection, penalties for violations, reporting requirements, and protection measures;
4. Include a discussion of fire prevention measures to be implemented by workers during project activities; require workers dispose of cigarettes and cigars appropriately and not leave them on the ground or buried;
5. Require all property owner's contractors and employees to participate in BNSF's environmental sensitivity training program prior to commencing work at the Project site;
6. Describe the temporary and permanent habitat protection measures to be implemented at the project site;
7. Identify whom to contact if there are further comments and questions about the material discussed in the program;
8. Include printed training materials, including photographs and brief descriptions of desert tortoises, Mojave fringe-toed lizards, burrowing owls, golden eagles, nesting birds, badgers, and white-margined beardtongue, including behavior, ecology, sensitivity to human activities, legal protection, penalties for violations, reporting requirements, and protection measures;
9. Prominently display posters and descriptions in offices, conference rooms, employee break rooms, and other areas where employees may congregate of desert tortoises, Mojave fringe-toed lizards, burrowing owls, golden eagles, nesting birds, badgers,

and white-margined beardtongue, including behavior, ecology, sensitivity to human activities, legal protection, penalties for violations, reporting requirements, and protection measures; and

10. Include a training acknowledgment form to be signed by each worker indicating that they received training and shall abide by the guidelines.

The specific program can be administered by a competent individual(s) acceptable to the Designated Biologist.

Verification: 30 days prior to Pre-Construction Site Mobilization, the project owner shall provide to BLM's Wildlife Biologist and the CPM a copy of the final WEAP and all supporting written materials and electronic media prepared or reviewed by the Designated Biologist and a resume of the person(s) administering the program.

The project owner shall provide in the Monthly Compliance Report the number of persons who have completed the training in the prior month and a running total of all persons who have completed the training to date. At least 10 days prior to Pre-Construction Site Mobilization the project owner shall submit two copies of the BLM- and CPM-approved final WEAP. Training acknowledgement forms signed during construction shall be kept on file by the project owner for at least 6 months after the start of commercial operation.

Throughout the life of the project, the WEAP shall be repeated annually for permanent employees, and shall be routinely administered within one week of arrival to any new construction personnel, foremen, contractors, subcontractors, and other personnel potentially working within the project area. Upon completion of the orientation, employees shall sign a form stating that they attended the program and understand all protection measures. These forms shall be maintained by the project owner and shall be made available to BLM's Wildlife Biologist and the CPM upon request. Workers shall receive and be required to visibly display a hardhat sticker or carry a certificate on their person that they have completed the training.

During project operation, signed statements for operational personnel shall be kept on file for 6 months following the termination of an individual's employment.

BIOLOGICAL RESOURCES MITIGATION IMPLEMENTATION AND MONITORING PLAN

BIO-7 The project owner shall develop a Biological Resources Mitigation Implementation and Monitoring Plan (BRM IMP), and shall submit two copies of the proposed BRMIMP to the BLMs Wildlife Biologist and the CPM for review and approval. The project owner shall implement the measures identified in the approved BRMIMP. The BRMIMP shall incorporate avoidance and minimization measures described in final versions of (as applicable) the Hazardous Materials Plan; the Revegetation Plan; the Weed Management Plan; the Special-Status Plant Protection and Monitoring Plan; the Special-Status Plant Remedial Action Plan; the Seed Collection Plan; the Protected

Plant Salvage Plan; the Desert Tortoise Translocation Plan; the Raven Monitoring, Management, and Control Plan; the Burrowing Owl Monitoring and Mitigation Plan; the Bighorn Sheep Mitigation Plan; the Streambed Management Plan; Frac-Out Contingency Plan; and the Evaporation Pond Design, Monitoring, and Management Plan.

The BRMIMP shall be prepared in consultation with the Designated Biologist and shall include accurate and up-to-date maps depicting the location of sensitive biological resources that require temporary or permanent protection during construction and operation. The BRMIMP shall include complete and detailed descriptions of the following:

1. All biological resources mitigation, monitoring, and compliance measures proposed and agreed to by the project owner;

2. All biological resources conditions of certification identified as necessary to avoid or mitigate impacts;

3. All biological resource mitigation, monitoring, and compliance measures required in federal agency terms and conditions, such as those provided in the USFWS Biological Opinion, the CDFG 2080.1 consultation, and BLM stipulations;

4. All sensitive biological resources to be impacted, avoided, or mitigated by project construction, operation, and closure;

5. All required mitigation measures for each sensitive biological resource;

6. All measures that shall be taken to avoid or mitigate temporary disturbances from construction activities;

7. Duration for each type of monitoring and a description of monitoring methodologies and frequency;

8. Performance standards to be used to help decide if/when proposed mitigation is or is not successful;

9. Remedial measures to be implemented if performance standards are not met;

10. Biological resources-related facility closure measures including a description of funding mechanism(s);

10. A process for proposing BRMIMP modifications to BLM's Wildlife Biologist and the CPM and appropriate agencies for review and approval; and

11. A requirement to submit any incidental sightings of any special-status species that are observed on or in proximity to the project site during project construction, operation, or during focused surveys conducted as part of the project's mitigation measures, to the California Natural Diversity Data Base (CNDDB) per CDFG

requirements.

12. A Frac-Out Contingency Plan approved by the CPM in consultation with CDFG prior to commencement of construction of the water pipeline for horizontal directional drilling under the BNSF railroad tracks.

Verification: The project owner shall submit the final BRMIMP to BLM's Wildlife Biologist and the CPM at least 30 days prior to start of any Pre-Construction Site Mobilization. The BRMIMP shall contain all of the required measures included in all biological Conditions of Certification. No construction-related ground disturbance, grading, boring, or trenching may occur prior to approval of the final BRMIMP by BLM's Wildlife Biologist and the CPM.

If any permits have not yet been received when the BRMIMP is first submitted, these permits shall be submitted to BLM's Wildlife Biologist and the CPM within five days of their receipt, and the BRM IMP shall be revised or supplemented to reflect the permit conditions within at least 10 days of their receipt by the project owner. Ten days prior to site and related facilities mobilization, the revised BRM IMP shall be resubmitted to BLM's Wildlife Biologist and the CPM.

To verify that the extent of construction disturbance does not exceed that described in this analysis, the project owner shall submit aerial photographs, at an approved scale, taken before and after construction to the CPM and BLM's Wildlife Biologist. The first set of aerial photographs shall reflect site conditions prior to any preconstruction site mobilization and construction-related ground disturbance, grading, boring, or trenching, and shall be submitted at least 30 days prior to initiation of such activities. Aerials shall be at a scale of 1:6000, on 11x17, 2 copies with 1 electronic, reference map, reference key on each aerial and a project boundary included. Electronic files shall be provided as shapefiles and/or GO database files. The second set of aerial photographs shall be taken subsequent to completion of construction, and shall be submitted to the CPM and BLM's Wildlife Biologist no later than 90 days after completion of construction. The project owner shall also provide a final accounting of the acreages of vegetation communities/cover types present before and after construction and a depiction of the approved project boundaries superimposed on the post project aerial photograph. If final acreages and/or disturbance footprints exceed those previously approved, the project owner shall coordinate with staff, CDFG, and USFWS to determine appropriate mitigation for such impacts. Such mitigation may exceed the requirements as outlined in these Conditions of Certification (i.e., higher mitigation ratios may be imposed at the discretion of the wildlife agencies).

Any changes to the approved BRMIMP (including the project footprint) must be approved by BLM's Wildlife Biologist and the CPM and in consultation with CDFG and USFWS before such action is taken. Implementation of BRMIMP measures (for example, construction activities that were monitored, species observed) shall be reported in the Monthly Compliance Reports by the Designated Biologist. Within 30 days after completion of project construction, the project owner shall provide to BLM's Wildlife Biologist and the CPM, for review and approval, a written Construction Termination

Report identifying which items of the BRMIMP have been completed, summarizing all modifications to mitigation measures made during the project's preconstruction site mobilization and construction-related ground disturbance, grading, boring, and trenching, naming any mitigation and monitoring items still outstanding, and providing a timeline for implementing outstanding items. The project owner shall coordinate with the CPM and BLM's Wildlife Biologist to revise and finalize the Construction Termination Report to fulfill its reporting requirements.

IMPACT AVOIDANCE AND MINIMIZATION MEASURES

BIO-8 The project owner shall undertake the following measures to manage the construction site and related facilities in a manner to avoid or minimize impacts to biological resources. All measures shall be subject to review and approval by the CPM.

1. Limit Disturbance Areas and Perimeter Fencing. The boundaries of all areas to be disturbed (including staging areas, access roads, and sites for temporary placement of spoils) shall be delineated with stakes and flagging prior to construction activities in consultation with the Designated Biologist. Spoils and topsoil shall be stockpiled in disturbed areas lacking native vegetation and which do not provide habitat for special-status species. Parking areas, staging and disposal site locations shall similarly be located in areas without native vegetation or special-status species habitat. All disturbances, project vehicles, and equipment shall be confined to the flagged areas. Tortoise fencing shall be placed along the outside perimeter of the access road that would provide access to areas outside of the designated project site.

2. Minimize Road Impacts. New and existing roads that are planned for construction, widening, or other improvements shall not extend beyond the flagged impact area as described above. All vehicles passing or turning around would do so within the planned impact area or in previously disturbed areas. Where new access is required outside of existing roads or the construction zone, the route shall be clearly marked (i.e., flagged and/or staked) prior to the onset of construction.

3. Minimize Traffic Impacts. Vehicular traffic during project construction and operation shall be confined to existing designated routes of travel to and from the project site, and cross country vehicle and equipment use outside designated work areas shall be prohibited. The speed limit shall not exceed 25 miles per hour within the project area, on maintenance roads for linear facilities, or on access roads to the project site. Speed limits on paved roads shall be consistent with posted speed limits.

4. Monitor During Construction. Due to the likelihood that juvenile desert tortoises may persist on the site after desert tortoise clearance surveys and exclusion fencing are completed, the Designated Biologist or Biological Monitor shall be present at the construction site during all project activities that have potential to disturb soil, vegetation, and wildlife. The Designated Biologist or Biological Monitor

shall walk immediately ahead of equipment during initial brushing and grading activities. Any time over the life of the project that a desert tortoise is found within the exclusion fencing, the Designated Biologist shall immediately contact the CPM, CDFG, BLM and USFWS; monitor the tortoise's location and activities; and implement translocation of the animal in accordance with and the approved Desert Tortoise Translocation Plan and in consultation with the USFWS, CDFG, BLM, and CPM.

5. Minimize Impacts of Transmission/Pipeline Alignments, Roads, Staging Areas. Staging areas for construction on the plant site shall be within the area that has been fenced with desert tortoise exclusion fencing and cleared for tortoise. For construction activities outside of the plant site (transmission line, pipeline alignments) access roads, pulling sites, and storage and parking areas shall be designed, installed, and maintained with the goal of minimizing impacts to native plant communities and sensitive biological resources. Transmission lines and all electrical components shall be designed, installed, and maintained in accordance with the Avian Power Line Interaction Committee's (APLI C's) S*uggested Practices for Avian Protection on Power Lines* (APLIC 2006) and *Mitigating Bird Collisions with Power Lines* (APLIC 2004) to reduce the likelihood of large bird electrocutions and collisions.

6. Avoid Use of Toxic Substances. Soil bonding and weighting agents used on unpaved surfaces shall be non-toxic to wildlife and plants.

7. Minimize Lighting Impacts. Facility lighting shall be designed, installed, and maintained to prevent side casting of light towards wildlife habitat.
8. Avoid Vehicle Impacts to Desert Tortoise. Parking and storage shall occur within the area enclosed by desert tortoise exclusion fencing to the extent feasible. No vehicles or construction equipment parked outside the fenced area shall be moved prior to an inspection of the ground beneath the vehicle for the presence of desert tortoise. If a desert tortoise is observed, it shall be left to move on its own. If it does not move within 15 minutes, a Designated Biologist or Biological Monitor under the Designated Biologist's direct supervision may remove and relocate the animal to a safe location if temperatures are within the range described in the USFWS' 2009 *Desert Tortoise Field Manual* (http:www.fws.gov/ventura/speciesinfo/protocols_guidelines). All tortoise translocation will be consistent with the measures identified in the Desert Tortoise Translocation Plan. All access roads outside of the fenced project footprint shall be delineated with temporary desert tortoise exclusion fencing on either side of the access road, unless otherwise authorized by the CPM, BLM's Wildlife Biologist, USFWS, and CDFG.

9. Avoid Wildlife Pitfalls:

   a. Avoid Wildlife Entrapment. At the end of each work day, the Designated Biologist or Biological Monitor shall ensure that all potential wildlife pitfalls (trenches, bores, and other excavations) have been backfilled. If backfilling is not done, all

trenches, bores, and other excavations shall be sloped at a 3:1 ratio at the ends to provide wildlife escape ramps, or covered completely to prevent wildlife access, or fully enclosed with desert tortoise-exclusion fencing. All trenches, bores, and other excavations outside the areas permanently fenced with desert tortoise exclusion fencing shall be inspected periodically, but no less than three times, throughout the day and at the end of each workday by the Designated Biologist or a Biological Monitor. Should a tortoise or other wildlife become trapped, the Designated Biologist or Biological Monitor shall remove and relocate the individual as described in the Desert Tortoise Relocation/Translocation Plan. Any wildlife encountered during the course of construction shall be allowed to leave the construction area unharmed.

b. Avoid Entrapment of Desert Tortoise. Any construction pipe, culvert, or similar structure with a diameter greater than 3 inches, stored less than 8 inches aboveground area) for one or more nights, shall be inspected for tortoises before the material is moved, buried, or capped. As an alternative, all such structures may be capped before being stored outside the fenced area, or placed on pipe racks.

10. Minimize Standing Water. Water applied to dirt roads and construction areas (trenches or spoil piles) for dust abatement shall use the minimal amount needed to meet safety and air quality standards in an effort to prevent the formation of puddles, which could attract desert tortoises and common ravens to construction sites. A Biological Monitor shall patrol these areas to ensure water does not puddle and shall take appropriate action to reduce water application where necessary.

11. Dispose of Road-killed Animals. Road-killed animals or other carcasses detected on roads near the project area shall be picked up immediately and delivered to the Designated Biologist or Biological Monitor. For special-status species roadkill, the Biological Monitor shall contact USFWS and CDFG within 1 working day of receipt of the carcass for guidance on disposal or storage of the carcass. The Biological Monitor shall report the special-status species record as described in Conditions of Certification **BIO-2** and **BIO-26.**

12. Minimize Spills of Hazardous Materials. All vehicles and equipment shall be maintained in proper working condition to minimize the potential for fugitive emissions of motor oil, antifreeze, hydraulic fluid, grease, or other hazardous materials. The Designated Biologist shall be informed of any hazardous spills immediately as directed in the project's Hazardous Materials Plan. Hazardous spills shall be immediately cleaned up and the contaminated soil properly disposed of at a licensed facility. Servicing of construction equipment shall take place only at a designated area. Service/maintenance vehicles shall carry a bucket and pads to absorb leaks or spills.

13. Worker Guidelines. During construction all trash and food-related waste shall be placed in self-closing containers and removed from the site regularly to prevent overflow. Workers shall not feed wildlife or bring pets to the project site. Except for law enforcement personnel, no workers or visitors to the site shall bring firearms

or weapons. Vehicular traffic shall be confined to existing routes of travel to and from the project site, and cross country vehicle and equipment use outside designated work areas shall be prohibited. The speed limit when traveling on dirt access routes within desert tortoise habitat shall not exceed 25 miles per hour.

14. Implement Erosion Control Measures. Standard erosion control measures shall be implemented for all phases of construction and operation to prevent any sediment run-off from exposed slopes from entering state-jurisdictional streambeds on or off the Project site. Sediment and other flow-restricting materials shall be moved to a location where they shall not be washed back into the streambed. All disturbed soils and roads within the project site shall be stabilized to reduce erosion potential, both during and following construction, except that soil stabilizer use may be limited in portions of roads crossing washes or stream channels consistent with applicable water quality requirements.

15. Monitor Ground-Disturbing Activities Prior to Pre-Construction Site Mobilization. If pre-construction site mobilization requires ground-disturbing activities such as for geotechnical borings or hazardous waste evaluations, a Designated Biologist or Biological Monitor shall be present to monitor any actions that could disturb soil, vegetation, or wildlife.

16. Control and Regulate Fugitive Dust. To reduce the potential for the transmission of fugitive dust the project owner shall implement dust control measures. These shall include:

    a. The project owner shall apply non-toxic soil binders, equivalent or better in efficiencies than the CARB-approved soil binders, to active unpaved roadways, unpaved staging areas, and unpaved parking area(s) throughout construction to reduce fugitive dust emissions.

    b. Water the disturbed areas of the active construction sites at least three times per day and more often if uncontrolled fugitive dust is noted.

    c. Enclose, cover, water twice daily, and/or apply non-toxic soil binders according to manufacturer's specifications to exposed soil piles with a 5 percent or greater silt content.

    d. Establish a vegetative ground cover, consistent with **BIO-10,** or otherwise create stabilized surfaces on all unpaved areas at each of the construction sites within 21 days after active construction operations have ceased, consistent with erosion control measures described above.

    e. Increase the frequency of watering, if water is used as a soil binder for disturbed surfaces, or implement other additional fugitive dust mitigation measures, to all active disturbed fugitive dust emission sources when wind speeds (as instantaneous wind gusts) exceed 25 mph.

17. Frac-Out Contingency Plan. A Frac-Out Contingency Plan must be approved by the

CPM in consultation with CDFG prior to commencement of construction of the water pipeline for horizontal directional drilling under the BNSF railroad tracks.

Verification: All mitigation measures and their implementation methods shall be included in the BRMIMP and implemented. Implementation of the measures shall be reported in the Monthly Compliance Reports by the Designated Biologist. Within 30 days after completion of project construction, the project owner shall provide to BLM's Wildlife Biologist and the CPM, for review and approval, a written construction termination report identifying how measures have been completed.

COMPLIANCE VERIFICATION

BIO-9 The project owner shall provide Energy Commission staff, BLM, CDFG, and USFWS with reasonable access to the project site and mitigation lands under the control of the project owner and shall otherwise fully cooperate with the Energy Commission's and BLM's efforts to verify the project owner's compliance with, or the effectiveness of, mitigation measures set forth in the conditions of certification. The project owner shall hold harmless the Designated Biologist, the Energy Commission and staff, BLM, and any other agencies with regulatory requirements addressed by the Energy Commission's sole permitting authority for any costs the project owner incurs in complying with the management measures, including stop work orders issued by the CPM or the Designated Biologist. The Designated Biologist shall do all of the following:

1. Notification. Notify the CPM, BLM, CDFG, and USFWS at least 14 calendar days before initiating ground-disturbing activities. Immediately notify the CPM, BLM, CDFG, and USFWS in writing if the project owner is not in compliance with any conditions of certification, including but not limited to any actual or anticipated failure to implement mitigation measures within the time periods specified in the conditions of certification. CDFG shall be notified at their Southern Region Headquarters Office, 4949 Viewridge Avenue, San Diego, CA 92123; (858) 467-4201. USFWS shall be notified at their Ventura office at 2493 Portola Road, Suite B, Ventura, CA 93003; (805) 644-1766.

2. Monitoring During Grading. Remain on site daily while grubbing and grading are taking place to avoid or minimize take of listed species, to check for compliance with all impact avoidance and minimization measures, and to check all exclusion zones to ensure that signs, stakes, and fencing are intact and that human activities are restricted in these protected zones.

3. Fence Monitoring. During construction maintain and check all of the desert tortoise exclusion fences on a weekly basis to ensure the integrity of the fence is maintained. The Designated Biologist shall be present on site to monitor construction and determine fence placement during initial fence installation. During operation of the project, fence inspections shall occur at least once per month throughout the life of the project, and within 24 hours after storms or other events that might affect the integrity and function of desert tortoise exclusion fences. Fence repairs shall occur within two days (48 hours) of detecting

problems that affect the functioning of the desert tortoise exclusion fencing. If fence damage occurs during any time of year when tortoises may be active, the project owner shall be responsible for monitoring the site of the damaged fence until it is fully repaired, to prevent a desert tortoise from entering the project area. All incidents of damaged tortoise exclusion fence, including dates of damage and repair; extent of damage; and monitoring summaries (methods and results) shall be reported to the BLM, CPM, CDFG, and USFWS. All wildlife found entrapped or dead in the fence shall be reported to the BLM, CPM, CDFG, and USFWS.

4. Monthly Compliance Inspections. Conduct compliance inspections at a minimum of once per month after clearing, grubbing, and grading are completed and submit a monthly compliance report to the CPM, BLM, USFWS, and CDFG. All observations of listed species and their sign shall be reported to the Designated Biologist for inclusion in the monthly compliance report.

5. Annual Listed Species Status Report. No later than January 31 of every year the Project facility remains in operation, provide the CPM, BLM, USFWS, and CDFG an annual Listed Species Status Report, which shall include, at a minimum: 1) a general description of the status of the project site and construction/operation activities, including actual or projected completion dates, if known; 2) a copy of the table in the BRMIMP with notes showing the current implementation status of each mitigation measure; 3) an assessment of the effectiveness of each completed or partially completed mitigation measure in minimizing and compensating for project impacts, 4) recommendations on how effectiveness of mitigation measures might be improved, and 5) a summary of any agency approved modifications to the BRMIMP.

6. Final Listed Species Mitigation Report. No later than 45 days after initiation of project operation, provide the CPM a Final Listed Species Mitigation Report that shall include, at a minimum: 1) a copy of the table in the BRM IMP with notes showing when each of the mitigation measures was implemented; 2) all available information about project-related incidental take of listed species; 3) information about other project impacts on the listed species; 4) construction dates; 5) an assessment of the effectiveness of conditions of certification in minimizing and compensating for project impacts; 6) recommendations on how mitigation measures might be changed to more effectively minimize and mitigate the impacts of future projects on the listed species; and 7) any other pertinent information, including the level of take of the listed species associated with the project.

7. Notification of Injured, Dead, or Relocated Listed Species. In the event of a sighting of an injured, killed, or relocated listed species in an active construction area (e.g., with equipment, vehicles, or workers), the CPM, BLM, CDFG, and USFWS shall be notified immediately by phone by the Designated Biologist or Biological Monitor. Notification shall occur no later than noon on the business day following the event if it occurs outside normal business hours so that the agencies can determine if further actions are required to protect listed species. Written follow-up notification via FAX or electronic communication shall be submitted to these

agencies within five calendar days of the incident and include the following information as relevant:

a. Injured Desert Tortoise. If a desert tortoise is injured as a result of project-related activities during construction, the Designated Biologist shall immediately take it to a CDFG-approved wildlife rehabilitation and/or veterinarian clinic. Any veterinarian bills for such injured animals shall be paid by the project owner. Following phone notification as required above, the CPM, BLM, CDFG, and USFWS shall determine the final disposition of the injured animal, if it recovers. Written notification shall include, at a minimum, the date, time, location, circumstances of the incident, and the name of the facility where the animal was taken.

b. Desert Tortoise Fatality. If a desert tortoise is killed by project-related activities during construction or operation, or if a desert tortoise is otherwise found dead, submit a written report with the same information as an injury report. These desert tortoises shall be salvaged according to guidelines described in Salvaging Injured, Recently Dead, Ill, and Dying Wild, Free-Roaming Desert Tortoise (Berry 2001). The project owner shall pay to have the desert tortoises transported and necropsied. The report shall include the date and time of the finding or incident.

8. Stop Work Order. The CPM/BLM may issue the project owner a written stop work order to suspend any activity related to the construction or operation of the project to prevent or remedy a violation of one or more conditions of certification (including but not limited to failure to comply with reporting, monitoring, or habitat acquisition obligations) or to prevent the illegal take of an endangered, threatened, or candidate species. The project owner shall comply with the stop work order immediately upon receipt thereof.

Verification: No later than two calendar days following the above-required notification of a sighting, kill, injury, or relocation of a listed species, the project owner shall deliver to the CPM, BLM, CDFG, and USFWS via FAX or electronic communication the written report from the Designated Biologist describing all reported incidents of the sighting, injury, kill, or relocation of a listed species, identifying who was notified and explaining when the incidents occurred. In the case of a sighting in an active construction area, the project owner shall, at the same time, submit a map (e.g., using Geographic Information Systems) depicting both the limits of construction and sighting location to the CPM, BLM, CDFG, and USFWS.

No later than January 31st of every year the Calico Solar Project facility remains in operation, provide the CPM and BLM an annual Listed Species Status Report as described above, and a summary of desert tortoise exclusion fence inspections and repairs conducted in the course of the year.

REVEGETATION PLAN AND COMPENSATION FOR IMPACTS TO NATIVE VEGETATION COMMUNITIES

BIO-10 The project owner shall provide restoration/compensation for impacts to native vegetation communities and develop and implement a Revegetation Plan for all areas subject to temporary project disturbance, including but not limited to linear features and berms of detention or debris basins, to the extent permitted by stormwater control requirements. Upon completion of construction, all temporarily disturbed areas shall be restored to pre-project grade and revegetated according to the measures described below. Temporarily disturbed areas within the project area include, but are not limited to: all areas where underground infrastructure was installed, temporary access roads, construction work temporary lay-down areas, and construction equipment staging areas. For the purpose of this mitigation measure, "temporarily disturbed areas" shall include disturbances that are considered permanent impacts in the analyses above (i.e., would take more than 5 years to recover) but would benefit from the revegetation activities identified here. Areas within the PV Tracker Blocks (unimproved module access points and the native soil rows) shall not be revegetated. The following measures shall be implemented for all temporarily disturbed areas, excluding areas immediately around facilities which may be landscaped according to a separate Landscape Plan. These measures will include:

1. Plan Details. The plans shall include at minimum: (a) locations and details for top soil storage; (b) methods to salvage and replant cacti, yucca or other species described in **BIO-12** Section E, or to plant out nursery stock of these species onto revegetation sites; (c) seed collection guidelines; (d) a schematic depicting the mitigation area; (e) time of year that the planting will occur and the methodology of the planting; (f) a description of the irrigation methodology if used; (g) measures to control exotic vegetation on site; (h) performance standards (see below); and (i) a detailed monitoring program. All temporary disturbance areas dominated by non-native species prior to project disturbance shall be revegetated using appropriate native species. This plan shall also contain contingency measures for failed restoration efforts (efforts not meeting success criteria).

2. Topsoil Salvage. Topsoil shall be stockpiled from the project site for use in revegetation of the temporarily disturbed areas. The topsoil excavated shall be segregated, kept intact, and protected, under conditions shown to sustain seed bank viability. The upper 1 inch of topsoil which contains the seed bank shall be scraped and stockpiled for use as the top-dressing for the revegetation area. An additional 6 to 8 inches of soil below the top 1 inch of soil shall also be scraped and separately stockpiled for use in revegetation areas. Topsoil shall be replaced in its original vertical orientation following ground disturbance, ensuring the integrity of the top one inch in particular. All other elements of soil stockpiling shall be

conducted as described on pages 39-40 of *Rehabilitation of Disturbed Lands in California* (Newton and Claassen 2003).

3. Seed and Nursery Stock. Only seed or potted nursery stock of locally occurring native species shall be used for revegetation. Seeds shall contain a mix of short-lived early pioneer species such as native annuals and perennials and subshrubs. Seeding and planting shall be conducted as described in Chapter 5 of *Rehabilitation of Disturbed Lands in California* (Newton and Claassen 2003). A list of plant species suitable for Mojave Desert region revegetation projects, including recommended seed treatments, are included in Appendix A-8 of the same report. The list of plants observed during the 2010 special-status plant surveys of the Project area can also be used as a guide to site-specific plant selection for revegetation. In conformance with BLM policy, the project owner shall include salvaged or nursery stock yucca (all species), cacti (excluding cholla species, genus *Cylindropuntia),* smoke tree, mesquites, and desert ironwood in revegetation plans and implementation, as described in **BIO-12** Section E.

4. Monitoring Requirement and Performance Standards. Post-seeding and planting monitoring will be yearly and shall continue for a period of no less than 10 years or until the defined performance standards are achieved (whichever is later). Remediation activities (e.g., additional planting, removal of non-native invasive species, or erosion control) shall be taken during the 10-year period if necessary to ensure the success of the restoration effort. If the mitigation fails to meet the established performance standards after the 10-year maintenance and monitoring period, monitoring and remedial activities shall extend beyond the 10-year period until the performance standards are met, unless otherwise specified by the Energy Commission and BLM. As needed to achieve performance standards, the project owner shall be responsible for replacement planting or other remedial action as agreed to by BLM and CPM. Replacement plants shall be monitored with the same survival and growth requirements as required for original revegetation plantings. The following performance standards must be met by the end of the monitoring period: (a) at least 80% of the species and vegetative cover observed within the temporarily disturbed areas shall be native species that naturally occur in desert scrub habitats; (b) absolute cover and density of native plant species within the revegetated areas shall equal at least 60% of the pre-disturbance or reference vegetation cover; and (c) the site shall have gone without irrigation or remedial planting for a minimum of three years prior to completion of monitoring.

5. If a fire or flood damages a revegetation area within the 10-year monitoring period, the owner shall be responsible for a one-time replacement. If a second fire or flood occurs, no replanting is required, unless the event is caused by the owner's activity (e.g., as determined by BLM or other

firefighting agency investigation).

Verification: All mitigation measures and their implementation methods shall be included in the BRMIMP and implemented. Within 90 days after completion of each year of project construction, the project owner shall provide to the CPM verification of the total vegetation acreage subject to temporary and permanent disturbance. To monitor and evaluate the success of the revegetation, the project owner shall submit annual reports of the revegetation including the status of the site, percent cover of native and exotics, and any remedial actions conducted by the owner to the CPM and BLM Wildlife Biologist.

At least 30 days prior to Pre-Construction Site Mobilization, the project owner shall submit to the CPM and BLM's Wildlife Biologist a final agency-approved Revegetation Plan. The Plan shall include a Plant Salvage and Replacement Section as described in **BIO-12** Section E. All modifications to the Revegetation Plan shall be made only after approval from BLM's Wildlife Biologist and the CPM.

Within 30 days after completion of each year of project construction, the project owner shall provide to the CPM for review and approval, a written report identifying which items of the Revegetation Plan have been completed, a summary of all modifications to mitigation measures made during the project's construction phase, and which items are still outstanding.

On January 31st of each year following construction until the completion of the revegetation monitoring specified in the Revegetation Plan, the Designated Biologist shall provide a report to the CPM and BLM's Wildlife Biologist that includes: a summary of revegetation activities for the year, a discussion of whether revegetation performance standards for the year were met; and recommendations for revegetation remedial action, if warranted, are planned for the upcoming year.

WEED MANAGEMENT PLAN

BIO-11 The project owner shall prepare and implement a Weed Management Plan that meets the approval of BLM and CPM. The draft Weed Management Plan submitted by the project owner shall provide the basis for the final plan, subject to review and revisions from BLM, USFWS, CDFG, and the CPM.

The final plan shall include weed control measures with demonstrated records of success, based on the best available information from sources such as: The Nature Conservancy's The Global Invasive Species Team, Cooperative Extension, California Invasive Plant Council http://www.cal-ipc.org/ip/ management/plant profiles/index. php, and the California Department of Food & Agriculture Encycloweedia: http://www.cdfa.ca.gov/phpps/ipc/encycloweedia/encycloweedia hp.htm. The methods shall meet the following criteria:

1. Manual: well-timed removal of plants or seed heads with hand tools; seed heads and plants must be disposed of in accordance with guidelines from the San Bernardino County Agricultural Commissioner.

2. Chemical: Herbicides known to have residual toxicity, such as pre-emergents and pellets, shall not be used in natural areas or within the engineered channels. Only the following application methods may be used: wick (wiping onto leaves); inner bark injection; cut stump; frill or hack & squirt (into cuts in the trunk); basal bark girdling; foliar spot spraying with backpack sprayers or pump sprayers at low pressure or with a shield attachment to control drift, and only on windless days, or with a squeeze bottle for small infestations.

   In addition to describing weed eradication and control methods, and a reporting plan for weed management during and after construction, the final Weed Management Plan shall include the following Best Management Practices to prevent the spread and propagation of weeds:

   - Limit the extent of any vegetation and/or ground disturbance to the absolute minimum needed, and limit ingress and egress to defined routes.

   - Install and maintain vehicle wash and inspection stations and closely monitor the types of materials brought onto the site.

- Reestablish vegetation on disturbed sites with native seed mixes (measures and performance standards to be consistent with Revegetation Plan, described in Condition of Certification **BIO-10).**

- Monitoring and timely implementation of control measures to ensure early detection and eradication for weed invasions. Weed infestations must be controlled or eradicated as soon as possible upon discovery, and before they go to seed, to prevent further expansion.

- Use only weed-free straw or hay bales used for sediment barrier installations, and weed-free seed.

- Reclamation and revegetation shall occur on all temporarily disturbed areas, including, but not limited to, transmission lines, temporary access roads, construction work temporary lay-down areas, and staging areas.

- Control weeds in areas where irrigation and panel or mirror washing take place.

- Prohibit disposal of mulch or green waste from mown weed infestations within the project area to prevent inadvertent introduction and spread of invasive plants beyond the immediate vicinity of the project area and possibly into Environmentally Sensitive Areas (ESAs) within the project area or rare plant populations off-site. Mulch or green waste shall be removed from the site in a covered vehicle to prevent seed dispersal, and transported to a landfill or composting facility.

- Indicate where herbicides may be used, which herbicides, and specify techniques to be used to avoid chemical drift or residual toxicity to special-status plants, consistent with guidelines provided by the Nature Conservancy's The Global Invasive Species Team

  (http://www. invasive.org/gist/products. html).

- Avoid herbicide use or other control methods in or around ESAs, (see Condition of Certification **BIO-12)** on-site or off-site; prevent any herbicide drift into ESAs.

From the time construction begins and throughout the life of the project, surveying for new invasive weed populations and the monitoring of identified and treated populations shall be required within the project area and surrounding 250-foot buffer area. See also requirements for weed monitoring and treatment in the adjacent Pisgah Crater ACEC described in Condition of Certification **BIO-12.** Surveying and monitoring for weed infestations shall occur annually. Treatment of all identified weed populations shall occur at a minimum of once annually. When no new seedlings or resprouts are observed at treated sites for three consecutive, average rainfall years, the weed infestation at that site can be considered eradicated and weed control efforts, but not annual monitoring, may cease for that impact site.

Verification: At least 30 days prior to start of any pre-construction site mobilization, the project owner shall provide the BLM's Wildlife Biologist and the CPM with the final Weed Management Plan. Any further modifications to the approved Weed Management Plan shall be made only after consultation with the CPM and BLM's Wildlife Biologist in consultation with USFWS and CDFG. Within 30 days after completion of project construction, the project owner shall provide to the BLM's Wildlife Biologist and the CPM for review and approval, a written report identifying which items of the Weed Management Plan have been completed, a summary of all modifications to mitigation measures made during the project's construction phase, and which items are still outstanding. A summary report on weed management on the project site shall be submitted in the Annual Compliance Report during plant operations.

SPECIAL-STATUS PLANT IMPACT AVOIDANCE AND MINIMIZATION

BIO-12 This condition contains the following five sections:

- **Section A: White-margined Beardtongue Avoidance and Minimization Measures** describes measures to protect all white-margined beardtongue plants located within the project area or within 250 feet of its boundaries (including access roads, staging areas, laydown areas, parking and storage areas) from accidental and indirect impacts during construction, operation, and closure.
- **Section B: Conduct Late Season Botanical Surveys** confirms that 2010 summer-fall surveys have been completed.
- **Section C: Mitigation Requirements for Special-Status Plants Detected in the Summer/Fall Surveys** outlines the level of avoidance required for

plants detected during the 2010 summer-fall surveys, based on the species' rarity and conservation status. Avoidance is based on extent of local occurrences on the project site and, as applicable, extending onto contiguous public land. Where avoidance would result in on-site isolation of plant occurrences from essential ecological processes, or would cause local populations to become no longer viable, then off-site compensation would be allowed.

- **Section D: Off-Site Compensatory Mitigation for Special-Status Plants** describes performance standards for mitigation for a range of options for compensatory mitigation through acquisition, restoration/enhancement, or a combination of acquisition and restoration/enhancement, based on the species' rarity and conservation status.
- **Section E: Plant Salvage** describes measures to include potted nursery stock or salvaged specimens of certain cacti, yucca, and other species listed in San Bernardino County plant protection policies in revegetation plans, in conformance with BLM policy.

"Project Disturbance Area" encompasses all areas to be temporarily or permanently disturbed by the Project, including the plant site, linear facilities, and areas disturbed by temporary access roads, fence installation, construction work lay-down and staging areas, parking, storage, or by any other activities resulting in disturbance to soil or vegetation. Nothing in this condition requires the project owner to conduct botanical surveys on private lands adjacent to the project site when the project owner has made reasonable attempts to obtain permission to enter the property for survey work but was unable to obtain such permission.

The Project owner shall implement the following measures in Section A, B, C, D and E to avoid, minimize, and compensate for impacts to certain special-status plant species, based on species rarity and conservation status:

Section A: White-margined Beardtongue Avoidance and Minimization Measures

To protect all white-margined beardtongue plants located within the project area or within 250 feet of its boundaries (including access roads, staging areas, laydown areas, parking and storage areas) from accidental and indirect impacts during construction, operation, and closure, the Project owner shall implement the following measures:

1. Designated Botanist. An experienced botanist who meets the qualifications described in Section **B-2** below shall oversee compliance with all special-status plant avoidance, minimization, and compensation measures described in this condition throughout construction, operation, and closure. The Designated Botanist shall oversee and train all other Biological Monitors tasked with conducting botanical survey and monitoring work.

2. White-margined Beardtongue Impact Avoidance and Minimization Plan. The Project owner shall prepare and implement a White-margined Beardtongue Impact

Avoidance and Minimization Plan and shall incorporate the Plan into the BRMIMP (**BIO-7).** The Plan shall be designed to prevent direct or indirect effects of project construction and operation to all white-margined beardtongue occurrences within the project boundary, and to any other special status plants including small-flowered androstephium located within Environmentally Sensitive Areas (defined below). The Plan shall include the following elements:

a. Designate Environmentally Sensitive Areas (ESAs). Before construction, designate ESAs to protect all known white-margined beardtongue locations within the project site or within 250 feet of site boundaries. The ESAs shall include, at minimum, the approximately 18 acres of white-margined beardtongue occurrences as identified on Applicant's Exhibit 57, Alternative Site Layout #2. The locations of ESAs shall be clearly depicted on construction drawings, which shall also include all avoidance and minimization measures on the margins of the construction plans. The boundaries of the ESAs shall provide a minimum of 250 feet buffer area between white-margined beardtongue plant locations and any ground-disturbing project activity. The ESAs shall be clearly delineated in the field with permanent fencing and signs prohibiting movement of the fence under penalty of work stoppages and additional compensatory mitigation. ESAs shall also be permanently marked (with signage or other markers) to ensure that avoided plants are not inadvertently harmed during construction, operation, or closure.

b. Baseline data. Document baseline conditions, including numbers and areal extent of white-margined beardtongue and any other special-status plant occurrences within the ESAs;

c. Success criteria. Specify success standards for protection of special-status plant occurrences within the ESAs, and identify specific triggers for remedial action (e.g., numbers of plants dropping below a threshold);

d. Literature review. Describe and reference any available information about microhabitat preferences and fecundity, essential pollinators, reproductive biology, and propagation and culture requirements for white-margined beardtongue and any other special-status species within the ESAs;

e. Protection and avoidance measures. Describe measures (e.g., fencing, signage) to avoid direct and indirect construction and operation impacts to special-status plants within the ESAs; these shall include but shall not be limited to: (1) training components specific to protection of white-margined beardtongue and surrounding habitat buffer area, which shall be incorporated into the WEAP described in **BIO6;** (2) detailed specifications for avoiding herbicide and soil stabilizer drift, and shall include a list of herbicides and soil stabilizers that may be used on the Project with manufacturer's guidance on appropriate use; the Plan shall reference the Weed Management Plan (see Condition of Certification **BIO-11)** and shall be consistent with provisions of that Plan; (3) measures to ensure that erosion and sediment control do not inadvertently impact special-status plants located

within an ESA (e.g., by using invasive or nonnative plants in seed mixes, introducing pest plants through contaminated seed or straw, etc.). Where applicable, these measures shall be incorporated in the Weed Management Plan and Storm Water Pollution Prevention Plan. Also, designate spoil areas; equipment, vehicle, and materials storage areas; parking; equipment and vehicle maintenance areas, and; wash areas at least 100 feet from boundaries of any ESAs;

f. Monitoring and Reporting Requirements. The Designated Botanist shall conduct weekly monitoring of the ESAs during any construction or decommissioning activities within 100 feet of the ESAs, and quarterly monitoring for the remainder of construction and during operations. For the life of the project, the Project owner shall also conduct annual monitoring of the avoided occurrences within ESAs on-site, and off-site occurrences that are within 250 feet from the project boundary and are located on public lands or on private lands to which the Project owner has access. The project owner shall make reasonable attempts to obtain permission to enter adjacent private property for the purpose of rare plant monitoring (see Verification, below).

g. Remedial Action Measures. Specify remedial action measures to be implemented if success standards (above) are not met at any time during the life of the project;

h. Seed Collection. Over the life of the project, the project owner shall collect a small proportion of any available seed produced by white-margined beardtongue plants protected on-site within ESAs on an annual basis until propagation research (below) is complete and seed bank curators agree that sufficient seed has been placed into long-term storage. Seed collection must only be done under permit from the BLM; the project owner shall be responsible for obtaining and complying with applicable permit(s). The collection technique shall follow seed collection and storage guidelines contained in (Wall 2009a; Bainbridge 2007). Collection of seed shall be done by the Rancho Santa Ana Botanic Garden (RSABG) Conservation Program staff or other qualified seed or restoration specialist. The Project owner shall be responsible for all costs associated with seed collection and storage. All seed storage shall occur at RSABG or other qualified research institution and at least 40 percent of the collected seed shall remain in long-term storage at RSABG Seed Conservation Program, San Diego Natural History Museum, or other qualified seed conservation program. In the event that construction schedules or seed production prevent collection within ESAs on-site, the project owner must substitute off-site seed collection site as approved by the CPM in consultation with the BLM State Botanist;

i. Propagation research. The project owner shall be responsible for evaluating potential white-margined beardtongue propagation and reintroduction methods with the objective of developing horticultural techniques suitable for eventual introduction of nursery-grown white-

margined beardtongue on-site or off-site as remedial action measures if needed (paragraph g., above); a portion of seed (paragraph h., above) shall be made available for propagation research which may at some time inform contingency propagation efforts on the project site or elsewhere; propagation experimentation shall be funded by the project owner and conducted by a qualified research institution such as Rancho Santa Ana Botanic Garden and the results shall not be subject to a non-disclosure agreement. At minimum, propagation research shall include germination and seedling establishment trials under a variety of soil and humidity conditions reflecting the range of seasonal conditions found in the plant's natural habitat on the project site; plant growth from seedling to nursery stock size; and transplantation methods. These trials shall be conducted in part within growth chambers where temperature and humidity are controlled and in part on the project site or adjacent Pisgah ACEC under natural conditions.

j. Off-site sand transport monitoring and management. The White-margined Beardtongue Impact Avoidance and Minimization Plan shall include a sand transport monitoring and management section to document and manage project effects to eastward sand transport to occupied white-margined beardtongue aeolian sand habitat off-site to the east. At minimum, the plan shall include the following elements (1) quantify baseline eastward sand transport from the project area into the adjacent BLM Pisgah Crater ACEC, following methods described by Etyemezian et al. (2010); (2) specify methods and schedule for annual sand transport monitoring throughout the first five years of the project's life; (3) identification of thresholds which would trigger remediation requirements; and (4) development of adaptive management strategies to supplement eastward sand transport into the ACEC if needed. These strategies may include revisions to project fencing design, importing sand from off-site or transporting sand across the project site for further dispersal. No sand transport remediation work would be permitted to cause new land disturbance outside the project area as analyzed in this SSA.

k. Off-site weed monitoring and management. The White-margined Beardtongue Impact Avoidance and Minimization Plan shall include methods and schedule to monitor and manage weed abundance in occupied and suitable white-margined beardtongue habitat to the east. At minimum, the plan shall (1) quantify baseline weed abundance in the portion of the ACEC adjacent BLM Pisgah Crater ACEC, adjacent to and within 500 m of the eastern project boundary, north of the BNSF railroad tracks; (2) weed abundance monitoring schedule and methods to implement throughout that area by collecting and analyzing quantitative weed abundance during every

year of average or greater rainfall throughout the life of the project; (3) identify weed abundance thresholds which would trigger remediation requirements; and (4) specify weed control methods to be implemented as needed in occupied and suitable white-margined beardtongue habitat throughout the area described above.

Section B: Conduct Late-Season Botanical Surveys

The Project owner has conducted late-summer/fall botanical surveys in 2010 for late-season special-status plants.

Section C: Mitigation Requirements for Special-Status Plants Detected in the Summer/Fall Surveys

The Project owner shall apply the following avoidance standards to special-status plants detected during late 2010 summer/fall season surveys. Avoidance and/or the mitigation measures described in Section D below would reduce impacts to special-status plant species to less than significant levels.

Mitigation for CNDDB Rank S1 and S2 Plants: If species with a CNDDB rank of S1 (CDFG 2010b), excluding small-flowered androstephium (CNDDB S1.2), are detected within the Project Disturbance Area or would be directly impacted by discharges from or the diversion of streams around the Project, the Project owner shall implement avoidance measures to protect at least 75 percent of the local occurrence(s) of the species. For perennial species, the local occurrence(s) shall be measured by the number of individual plants located on the Project site or on public lands contiguous to the project site. For annual species, the occurrence(s) shall be measured as areal extent of contiguous occupied habitat on the site and on contiguous public lands. Avoidance shall include protection of the ecosystem processes essential for maintenance of the protected plant occurrence. Plants located within the ESAs established pursuant to Section A above shall be considered to be "avoided" to the extent that direct impacts on the plants are avoided and that these processes would be maintained. If special status plant occurrences are isolated by the Project from natural fluvial, aeolian, or other processes known to be necessary for their persistence or reproduction, these occurrences shall not be considered "avoided." This evaluation shall be made in consultation among the project Botanist and the CPM, in consultation with CDFG and BLM, on a case by case basis, dependent on the species and its location on the site. The Project owner shall provide compensatory mitigation as described below in Section D for Project impacts to CNDDB Rank S1 and S2 plants that are not avoided. If, after consultation among the project Botanist, CPM, CDFG, and BLM, on-site avoidance is determined not to satisfy the long-term viability of the plant occurrence(s), then compensatory mitigation may be substituted for avoidance for up to 100% of impacts to Rank S1 and S2 plants on the site, as described below in Section D.

Mitigation for CNDDB Rank S3 Plants: If species with a CNDDB rank of 3 are detected within the Project Disturbance Area, no onsite avoidance or compensatory mitigation shall be required unless the occurrence has local or regional significance, in which case the plant occurrence shall be treated as a CNDDB 2 ranked plant. A plant occurrence would be considered to have local or regional significance if:

a. It occurs at the outermost periphery of its range in California;

b. It occurs in an atypical habitat, region, or elevation for the taxon that suggests that the occurrence may have genetic significance (e.g., that may increase its ability to survive future threats), or;

c. It exhibits any unusual morphology that is not clearly attributable to environmental factors that may indicate a potential new variety or sub-species.

Should CNDDB Rank S3 plant locations meeting any of the three criteria above be found on the project site during summer or fall field surveys, then mitigation requirements for those species shall be as described above for CNDDB Rank S1 and S2 species.

Pre-Construction Notification for State- or Federal-Listed Species, or BLM Sensitive Species. If a state or federal-listed species or BLM Sensitive species is detected, the Project owner shall immediately notify the CDFG, USFWS, BLM, and the CPM.

Preservation of the Germplasm of Affected Special-Status Plants. For all impacts to CNPS List 1 or List 2 plants, excluding small-flowered androstephium, mitigation shall include seed collection from the affected special-status plants on-site prior to construction to conserve the germplasm and provide a seed source for restoration efforts. Where construction schedules or seed availability prevents seed collection from plant locations to be impacted during a given season, seed must be collected from another portion of the project site or, as approved by the CPM in consultation with BLM's State Botanist, from public lands off-site. Seed collection must only be done under permit from the BLM; the project owner shall be responsible for obtaining and complying with applicable permit(s). The seed shall be collected under the supervision or guidance of a reputable seed storage facility such as the Rancho Santa Ana Botanical Garden Seed Conservation Program, San Diego Natural History Museum, or the Missouri Botanical Garden. The costs associated with the long-term storage of the seed shall be the responsibility of the Project owner. Any efforts to propagate and reintroduce special-status plants from seeds in the wild shall be carried out under the direct supervision of specialists such as those listed above and as part of a Habitat Restoration/Enhancement Plan approved by the CPM.

Section D: Off-Site Compensatory Mitigation for Special-Status Plants

Where compensatory mitigation is required under the terms of Section C, above, the Project owner shall mitigate Project impacts to CNPS List 1 or List 2 plants,

excluding small-flowered androstephium with compensatory mitigation. Compensatory mitigation shall consist of acquisition of habitat supporting the target species, restoration/enhancement of populations of the target species, or a combination of acquisition and restoration/enhancement as provided within this Condition. Compensatory mitigation shall be at a 3:1 ratio. For annual species, compensation shall provide three acres of habitat acquired or restored/enhanced for every acre of special-status plant habitat disturbed by the Project Disturbance Area. For perennial species, compensation lands shall supporting three living plants of the same species for each plant disturbed within the project area. The Project owner shall provide funding for the acquisition and/or restoration/enhancement, initial improvement, and long-term maintenance and management of the acquired or restored lands. The actual costs to comply with this condition will vary

depending on the Project Disturbance Area, the actual costs of acquiring compensation habitat, the actual costs of initially improving the habitat, the actual costs of long-term management as determined by a Property Analysis Record (PAR) or PAR-like analysis, and other transactional costs related to the use of compensatory mitigation.

The Project owner shall comply with other related requirements in this condition:

I. Compensatory Mitigation by Acquisition: The requirements for the acquisition, initial protection and habitat improvement, and long-term maintenance and management of special-status plant compensation lands include all of the following:

Selection Criteria for Acquisition Lands. The compensation lands selected for acquisition may include any of the following three categories:

1. Occupied Habitat, No Habitat Threats: The compensation lands selected for acquisition shall be occupied by the target plant species and shall be characterized by site integrity and habitat quality that are required to support the target species, and shall be of equal or better habitat quality than that of the affected occurrence.
2. Occupied Habitat, Habitat Threats. Occupied compensation lands characterized by habitat threats may also be acquired as long as the population could be reasonably expected to recover with minor restoration (e.g., OHV or grazing exclusion, pest plant removal) and is accompanied by a Habitat Enhancement/Restoration Plan as described in Section D.II, below.
3. Unoccupied but Adjacent. The Project owner may also acquire habitat for which occupancy by the target species has not been documented, if the proposed acquisition lands are adjacent to occupied habitat. The Project owner shall provide evidence that acquisitions of such unoccupied lands would improve the defensibility and long-term sustainability of the occupied habitat

by providing a protective buffer around the occurrence and by enhancing connectivity with undisturbed habitat.

Review and Approval of Compensation Lands Prior to Acquisition. The Project owner shall submit a formal acquisition proposal to the CPM describing the parcel(s) intended for purchase. This acquisition proposal shall discuss the suitability of the proposed parcel(s) as compensation lands for special-status plants in relation to the criteria listed above, and must be approved by the CPM. Management Plan. The Project owner or approved third party shall prepare a management plan for the compensation lands in consultation with the entity that will be managing the lands. The goal of the management plan shall be to support and enhance the long-term viability of the target special-status plant occurrences. The Management Plan shall be submitted for review and approval to the CPM.

Integrating Special-Status Plant Mitigation with Other Mitigation lands. If all or any portion of the acquired Desert Tortoise, Waters of the State, or other required compensation lands meets the criteria above for special-status plant compensation lands, the portion of the other species' or habitat compensation lands that meets any of the criteria above may be used to fulfill that portion of the obligation for special-status plant mitigation.

Compensation Lands Acquisition Requirements. The Project owner shall comply with the following requirements relating to acquisition of the compensation lands after the CPM, has approved the proposed compensation lands:

a. Preliminary Report. The Project owner, or an approved third party, shall provide a recent preliminary title report, initial hazardous materials survey report, biological analysis, and other necessary or requested documents for the proposed compensation land to the CPM. All documents conveying or conserving compensation lands and all conditions of title are subject to review and approval by the CPM. For conveyances to the State, approval may also be required from the California Department of General Services, the Fish and Game Commission and the Wildlife Conservation Board.
b. Title/Conveyance. The Project owner shall acquire and transfer fee title to the compensation lands, a conservation easement over the lands, or both fee title and conservation easement, as required by the CPM. Any transfer of a conservation easement or fee title must be to CDFG, a non-profit organization qualified to hold title to and manage compensation lands (pursuant to California Government Code section 65965), or to BLM or other public agency approved by the CPM. If an approved non-profit organization holds fee title to the compensation lands, a conservation easement shall be recorded in favor of CDFG or another entity approved by the CPM. If an entity other than CDFG holds a conservation easement over the compensation lands, the CPM may require that CDFG or another entity approved by the CPM, in consultation with CDFG, be named a third party

beneficiary of the conservation easement. The Project owner shall obtain approval of the CPM of the terms of any transfer of fee title or conservation easement to the compensation lands.

c. Initial Protection and Habitat Improvement. The Project owner shall fund activities that the CPM requires for the initial protection and habitat improvement of the compensation lands. These activities will vary depending on the condition and location of the land acquired, but may include trash removal, construction and repair of fences, invasive plant removal, and similar measures to protect habitat and improve habitat quality on the compensation lands. The costs of these activities are estimated to be $750 per acre ($250 per acre, using the estimated cost per acre for Desert Tortoise mitigation as a best available proxy, at a 3:1 ratio, but actual costs will vary depending on the measures that are required for the compensation lands). A non-profit organization, CDFG or another public agency may hold and expend the habitat improvement funds if it is qualified to manage the compensation lands (pursuant to California Government Code section 65965), if it meets the approval of the CPM in consultation with CDFG, and if it is authorized to participate in implementing the required activities on the compensation lands. If CDFG takes fee title to the compensation lands, the habitat improvement fund must be paid to CDFG or its designee.

d. Property Analysis Record. Upon identification of the compensation lands, the Project owner shall conduct a Property Analysis Record (PAR) or PAR-like analysis to establish the appropriate amount of the long-term maintenance and management fund to pay the in-perpetuity management of the compensation lands. The PAR or PAR-like analysis must be approved by the CPM before it can be used to establish funding levels or management activities for the compensation lands.

e. Long-term Maintenance and Management Funding. The Project owner shall provide money to establish an account with long-term maintenance and management. that will be used to fund the long-term maintenance and management of the compensation lands. The amount of money to be paid will be determined through an approved PAR or PAR-like analysis conducted for the compensation lands. Until an approved PAR or PAR-like analysis is conducted for the compensation lands, the amount of required funding is initially estimated to be $4,350 for every acre of compensation lands, using as the best available proxy the estimated cost of $1,450 per acre for Desert Tortoise compensatory mitigation, at a 3:1 ratio. This amount may be revised by the CPM in consultation with DFG, BLM and USFWS, based on further analysis of long-term management and maintenance costs. If compensation lands will not be identified and a PAR or PAR-like analysis completed within the time period specified for this payment (see the verification section at the end of this

condition), the Project owner shall either: (i) provide initial payment equal to the amount of $4,350 multiplied by the number of acres the Project owner proposes to acquire for compensatory mitigation; or (ii) provide security to the Energy Commission under subsection (g), "Mitigation Security," below, in an amount equal to $4,350 multiplied by the number of acres the Project owner proposes to acquire for compensatory mitigation. The amount of the required initial payment or security for this item shall be adjusted for any change in the Project Disturbance Area as described above. If an initial payment is made based on the estimated per-acre costs, the Project owner shall deposit additional money as may be needed to provide the full amount of long-term maintenance and management funding indicated by a PAR or PAR-like analysis, once the analysis is completed and approved. If the approved analysis indicates less than $4,350 per acquired acre (at a 3:1 ratio) will be required for long-term maintenance and management, the excess paid will be returned to the Project owner. The Project owner must obtain the CPM's approval of the entity that will receive and hold the long-term maintenance and management fund for the compensation lands. The CPM will consult with CDFG before deciding whether to approve an entity to hold the Project's long-term maintenance and management funds.

The Project owner shall ensure that an agreement is in place with the long-term maintenance and management fund holder/manager to ensure the following requirements are met:

i. Interest. Interest generated from the initial capital long-term maintenance and management fund shall be available for reinvestment into the principal and for the long-term operation, management, and protection of the approved compensation lands, including reasonable administrative overhead, biological monitoring, improvements to carrying capacity, law enforcement measures, and any other action that is approved by the CPM and is designed to protect or improve the habitat values of the compensation lands.

ii. Withdrawal of Principal. The long-term maintenance and management fund principal shall not be drawn upon unless such withdrawal is deemed necessary by the CPM or by the approved third-party long-term maintenance and management fund manager, to ensure the continued viability of the species on the compensation lands.

iii. Pooling Long-Term Maintenance and Management Funds. An entity approved to hold long-term maintenance and management funds for the Project may pool those funds with similar non-wasting funds that it holds from other projects for long-term maintenance and management of compensation lands for special-status plants. However, for reporting purposes, the long-term maintenance and management funds for this Project must be tracked and reported individually to the CPM.

f. Other Expenses. In addition to the costs listed above, the Project owner shall be responsible for all other costs related to acquisition of compensation lands and conservation easements, including but not limited to the title and document review costs incurred from other state agency reviews, overhead related to providing compensation lands to CDFG or an approved third party, escrow fees or costs, environmental contaminants clearance, and other site cleanup measures.

g. Mitigation Security. The Project owner shall provide financial assurances to the CPM to guarantee that an adequate level of funding is available to implement any of the mitigation measures required by this condition that are not completed prior to the start of ground-disturbing Project activities. Financial assurances shall be provided to the CPM in the form of an irrevocable letter of credit, a pledged savings account or another form of security ("Security") approved by the CPM. The amount of the Security shall be based upon staff's estimate of per-acre acquisition, transaction, and management costs as described in Condition of Certification **BIO-17** for each acre of occupied habitat impacted using the estimated cost per acre for Desert Tortoise mitigation as a best available proxy, at a 3:1 ratio; see **Revised Biological Resources Tables 5** and **7)** for every acre of habitat supporting the target special-status plant species which is significantly impacted by the project. The actual costs to comply with this condition will vary depending on the actual costs of acquiring compensation habitat, the costs of initially improving the habitat, and the actual costs of long-term management as determined by a PAR or PAR-like analysis. Prior to submitting the Security to the CPM, the Project owner shall obtain the CPM's approval of the form of the Security. The CPM may draw on the Security if the CPM determines the Project owner has failed to comply with the requirements specified in this condition. The CPM may use money from the Security solely for implementation of the requirements of this condition. The CPM's use of the Security to implement measures in this condition may not fully satisfy the Project owner's obligations under this condition, and the Project owner remains responsible for satisfying the obligations under this condition if the Security is insufficient. The unused Security shall be returned to the Project owner in whole or in part upon successful completion of the associated requirements in this condition.

h. The Project owner may elect to comply with the requirements in this condition for acquisition of compensation lands, initial protection and habitat improvement on the compensation lands, or long-term maintenance and management of the compensation lands by funding, or any combination of these three requirements, by providing funds to implement those measures into the Renewable Energy Action Team (REAT) Account established with the National Fish and Wildlife Foundation (NFWF). To use this option, the Project owner must make an initial deposit to the REAT Account in an amount equal to the estimated costs (as set forth in the Security section of this condition) of implementing the requirement. If the actual cost of the acquisition, initial protection and habitat improvements, or long-term funding is more than the estimated amount initially paid by the Project owner, the Project owner shall make an additional deposit into the REAT Account sufficient to cover the actual acquisition costs, the actual costs of initial protection and habitat improvement on the compensation lands, and the long-term funding requirements as established in an approved PAR or PAR-

like analysis. If those actual costs or PAR projections are less than the amount initially transferred by the project owner, the remaining balance shall be returned to the Project owner.

i. The responsibility for acquisition of compensation lands may be delegated to a third party other than NFWF, such as a non-governmental organization supportive of desert habitat conservation, by written agreement of the Energy Commission. Such delegation shall be subject to approval by the CPM, in consultation with CDFG, BLM and USFWS, prior to land acquisition, enhancement or management activities. Agreements to delegate land acquisition to an approved third party, or to manage compensation lands, shall be executed and implemented within 18 months of the Energy Commission's certification of the Project.

II. Compensatory Mitigation by Habitat Enhancement/Restoration: As an alternative or adjunct to land acquisition for compensatory mitigation the Project owner may undertake habitat enhancement or restoration for the target special-status plant species. Habitat enhancement or restoration activities must achieve protection at a 3:1 ratio as described above, with improvements applied to three acres of habitat for every acre of special-status plant habitat directly or indirectly disturbed by the Project Disturbance Area for annual species; or to habitat supporting three living plants for each individual perennial plant directly or indirectly disturbed by the project. Examples of suitable enhancement projects include but are not limited to the following: i) control unauthorized vehicle use into an occurrence (or pedestrian use if clearly damaging to the species); ii) control noxious weeds that infest or pose an immediate threat to an occurrence; iii) exclude grazing by wild burros or livestock from an occurrence; or iv) restore lost or degraded hydrologic or geomorphic functions critical to the species by restoring previously diverted flows, removing obstructions to the wind sand transport corridor above an occurrence, or increasing groundwater availability for dependent species.

If the Project owner elects to undertake a habitat enhancement project for mitigation, the project must meet the following performance standards: The proposed enhancement project shall achieve rescue of an off-site occurrence that is currently assessed, based on the NatureServe threat ranking system (Master et al. 2009; Morse et al. 2004) with one of the following threat ranks: a) long-term decline 30 percent; b) an immediate threat that affects 30 percent of the population, or c) has an overall threat impact that is High to Very High. "Rescue" would be considered successful if it achieves an improvement in the occurrence trend to "stable" or "increasing" status, or downgrading of the overall threat rank to slight or low (from "High" to "Very High").

If the Project owner elects to undertake a habitat enhancement project for mitigation, they shall submit a Habitat Enhancement/Restoration Plan to the CPM for review and approval, and shall provide sufficient funding for implementation and monitoring of the Plan. The amount of the Security shall be based upon staff's estimate of per-acre acquisition, transaction, and management costs as described in Condition of Certification **BIO-17** for each acre of occupied habitat impacted by the project, using the estimated cost per acre for Desert Tortoise mitigation as a best available proxy, at a

3:1 ratio (see **Revised Biological Resources Tables 5** and **7).** The amount of the security may be adjusted based on the actual costs of implementing the enhancement, restoration and monitoring. The implementation and monitoring of the enhancement/restoration may be undertaken by an appropriate third party such as NFWF, subject to approval by the CPM. The Habitat Enhancement/Restoration Plan shall include each of the following:

1. Goals and Objectives. Define the goals of the restoration or enhancement project and a measurable course of action developed to achieve those goals. The objective of the proposed habitat enhancement plan shall include restoration of a target special-status plant occurrence that is currently threatened with a long-term decline. The proposed enhancement plan shall achieve an improvement in the occurrence trend to "stable" or "increasing" status, or downgrading of the overall threat rank to slight or low (from "High" to "Very High").
2. Historical Conditions. Provide a description of the pre-impact or historical conditions (before the site was degraded by weeds or grazing or ORV, etc.), and the desired conditions.
3. Site Characteristics. Describe other site characteristics relevant to the restoration or enhancement project (e.g., composition of native and pest plants, topography and drainage patterns, soil types, geomorphic and hydrologic processes important to the site or species.
4. Ecological Factors. Describe other important ecological factors of the species being protected, restored, or enhanced such as total population, reproduction, distribution, pollinators, etc.
5. Methods. Describe the restoration methods that will be used (e.g., invasive exotics control, site protection, seedling protection, propagation techniques, etc.) and the long-term maintenance required. The implementation phase of the enhancement must be completed within five years.
6. Budget. Provide a detailed budget and timeline; develop clear, measurable, objective-driven annual success criteria.
7. Monitoring. Develop clear, measurable monitoring methods that can be used to evaluate the effectiveness of the restoration and the benefit to the affected species. The Plan shall include a minimum of five years of quarterly monitoring, and then annual monitoring for the remainder of the enhancement project, or until the performance standards for rescue of a threatened occurrence are met, whichever comes first. At a minimum the progress reports shall include: quantitative measurements of the projects progress in meeting the enhancement project success criteria, detailed description of remedial actions taken or proposed, and contact information for the responsible parties.
8. Reporting Program. The Plan shall ensure accountability with a reporting program that includes progress toward goals and success criteria. Include names of responsible parties.

9. Contingency Plan. Describe the contingency plan for failure to meet annual goals.

10. Long-term Protection. Include proof of long-term protection for the restoration site. For private lands this would include conservations easements or other deed restrictions; projects on public lands must be contained in a Desert Wildlife Management Area, Wildlife Habitat Management Area, or other land use protections that will protect the mitigation site and target species.

Section E: Conformance with BLM and San Bernardino County Plant Protection Policies

It is BLM policy to salvage yucca and cactus plants (excluding cholla species, genus *Cylindropuntia)* and transplant them to undisturbed sites within project Rights of Way. The San Bernardino County Plant Protection and Management Ordinance regulates the following where they occur on non-government land (San Bernardino County Code 88.01): desert native plants with stems 2 inches or greater in diameter or 6 feet or greater in height: *Psorothamnus* [*Dalea] spinosa* (smoke tree), *Prosopis* spp. (mesquites), all species of the family Agavaceae (century plants, nolinas, yuccas), creosote rings 10 feet or greater in diameter, all Joshua trees; and any part of any of the following species, whether living or dead: *Olneya tesota* (desert ironwood), all species of the genus *Prosopis* (mesquites), and all species of the genus *Cercidium* (palo verdes). Staff recognizes that the project site is on public land and thus not strictly subject to the County ordinance but believes the County ordinance establishes an additional mitigation standard that should be applied to the project, as follows:

a. The project owner shall inventory all plants subject to BLM and County policies on the project site that would be removed or damaged by proposed project construction.
b. The project owner shall include salvaged plants or potted nursery stock of any species named in BLM or County policies in on-site revegetation planning and implementation, as described in **BIO-10.** The project owner shall include a Protected Plant Salvage and Replacement Section in the Revegetation Plan, in conformance with BLM. The Section also shall provide for incorporation of salvaged or potted stock of any species identified in the San Bernardino County standards that would be impacted by project development affected. The Section shall be made available for review and approval by the CPM. For salvaged plants, the Section shall include detailed descriptions of proposed methods to salvage plants; transport them; store them temporarily (as needed); and maintain them in temporary storage (i.e., irrigation, shade protection, etc.). For both salvaged plants and potted nursery stock, the Section shall include detailed descriptions of proposed planting locations and methods; proposed irrigation and maintenance methods at planting sites; and a monitoring plan to verify survivorship and establishment of the plants for a minimum of five years.

c. Concurrent with any ground-disturbing activities within any phase of the project, the project owner shall implement the Protected Plant Replacement measures as approved by the CPM and BLM's State Botanist.

Verification: The Special-Status Plant Impact Avoidance and Minimization Measures shall be incorporated into the BRMIMP as required under Condition of Certification **BIO-7.**

Implementation of the special-status plant impact avoidance and minimization measures shall be reported in the Monthly Compliance Reports prepared by the Designated Botanist. Within 30 days after completion of Project construction, the Project owner shall provide to the CPM, for review and approval in consultation with the BLM State Botanist, a written construction termination report identifying how measures have been completed.

The Project owner shall submit a monitoring report every year for the life of the project to monitor effectiveness of protection measures for all avoided special-status plants to the CPM and BLM State Botanist. The monitoring report shall include: dates of worker awareness training sessions and attendees, an inventory of the special-status plant occurrences and description of the habitat conditions, an indication of population and habitat quality trends, and description of the remedial action, if warranted and planned for the upcoming year.

Section A. No less than 30 days prior to the start of Pre-Construction Site Mobilization, the Project owner shall submit grading plans and construction drawings depicting the location of Environmentally Sensitive Areas and the Avoidance and Minimization Measures contained in Section A of this Condition. The project owner shall coordinate with the CPM and BLM's Botanist to revise and finalize boundaries of the ESAs. The 30 day limit may be reduced by the CPM.

No less than 30 days prior to the start of Pre-Construction Site Mobilization the Project owner shall submit to the CPM for review and approval, in consultation with the BLM Botanist, the name and resume of the project's Designated Botanist. If a Designated Botanist needs to be replaced, the specified information of the proposed replacement must be submitted to BLM's Botanist and the CPM as soon as possible prior to the termination or release of the Designated Botanist. In an emergency, the project owner shall immediately notify the BLM's Botanist and the CPM to discuss the qualifications and approval of a short-term replacement while a permanent Designated Botanist is proposed to BLM's Botanist and the CPM and for consideration. The 30 day limit may be reduced by the CPM.

No less than 30 days prior to start of Pre-Construction Site Mobilization the Project owner shall submit a draft White-margined Beardtongue Impact Avoidance and Minimization Plan to the CPM for review and approval, in consultation with the BLM Botanist. Implementation of the white-margined beardtongue impact avoidance and minimization measures shall be reported in the Monthly Compliance Reports prepared by the Designated Botanist. Within 30 days after completion of Project construction, the Project owner shall provide to the CPM, for review and approval in consultation with the BLM Botanist, a written construction termination report identifying how measures have

been completed. The 30 day limit may be reduced by the CPM.

The Project owner shall submit a monitoring report every year for the life of the project to monitor effectiveness of protection measures for all avoided white-margined beardtongue ESAs to the CPM and BLM Botanist. The monitoring report shall include: dates of worker awareness training sessions and attendees, an inventory of the special-status plant occurrences and description of the habitat conditions, an indication of population and habitat quality trends, and description of the remedial action, if warranted and planned for the upcoming year. The project owner shall coordinate with the CPM and BLM's Botanist to revise and finalize monitoring reports and all reports described in this section, and shall specifically report any difficulties in meeting the protection goals and cooperatively develop adaptive measures as needed.

Section B.

Section C. The Project owner shall immediately provide written notification to the CPM, CDFG, USFWS, and BLM if it detects a State- or Federal-Listed Species, or BLM Sensitive Species at any time during its late summer/fall botanical surveys or at any time thereafter through the life of the Project, including conclusion of Project decommissioning.

Prior to disturbance of special status plants, the project owner shall provide written verification that seed of any special status plants on the project site has been collected and conveyed to a facility (as described in this measure) and that suitable long-term funding has been provided by the project owner. As needed, the project owner shall consult with the CPM and BLM's Botanist to identify appropriate seed collection sites and dates.

Section D. If compensatory mitigation is required (based upon field survey results and mitigation strategy adopted by the project owner, as described in Sections C and D), no less than 30 days prior to the start of each phase of Pre-Construction Site Mobilization, the Project owner shall submit to the CPM Security adequate to acquire compensatory mitigation lands and/or undertake habitat enhancement or restoration activities for such phase, as described in this condition. The 30 day limit may be reduced by the CPM.

No fewer than 90 days prior to acquisition of any compensatory mitigation lands, the Project owner shall submit a formal acquisition proposal and draft Management Plan for the proposed lands to the CPM, with copies to CDFG, USFWS, and BLM, describing the parcels intended for purchase and shall obtain approval from the CPM prior to the acquisition. No fewer than 90 days prior to any acquisition of compensatory mitigation lands, the Project owner shall submit to the CPM and obtain CPM approval of any agreements to delegate land acquisition to an approved third party, or to manage compensation lands; such agreement shall be executed and implemented within 18 months of the start of Pre-Construction Site Mobilization.

The Project owner or an approved third party shall complete the acquisition and all

required transfers of the compensation lands, and provide written verification to the CPM of such completion no later than 18 months after the start of Pre-Construction Site Mobilization. If NFWF or another approved third party is being used for the acquisition, the Project owner shall ensure that funds needed to accomplish the acquisition are transferred in timely manner to facilitate the planned acquisition and to ensure the land can be acquired and transferred prior to the 18-month deadline. If habitat enhancement is proposed, no later than six months following the start of ground-disturbing activities, the Project owner shall obtain CPM approval of the final Habitat Enhancement/Restoration Plan, prepared in accordance with Section D, and submit to the CPM or a third party approved by the CPM Security adequate for long-term implementation and monitoring of the Habitat Enhancement/Restoration Plan.

Enhancement/restoration activities shall be initiated no later than 12 months from the start of Pre-Construction Site Mobilization. The implementation phase of the enhancement project shall be completed within five years of initiation. Until completion of the five-year implementation portion of the enhancement action, a report shall be prepared and submitted as part of the Annual Compliance Report. This report shall provide, at a minimum: a summary of activities for the preceding year and a summary of activities for the following year; quantitative measurements of the Project's progress in meeting the enhancement project success criteria; detailed description of remedial actions taken or proposed; and contact information for the responsible parties.

Within 18 months of the start of Pre-Construction Site Mobilization, the Project owner shall transfer to the CPM or an approved third party the difference between the Security paid and the actual costs of (1) acquiring compensatory mitigation lands, completing initial protection and habitat improvement , and funding the long-term maintenance and management of compensatory mitigation lands; and/or (2) implementing and providing for the long-term protection and monitoring of habitat enhancement or restoration activities.

Section E. The project owner shall coordinate with the CPM and BLM's Botanist to revise and finalize all plans and reports named in this section. Verification and reporting shall be as described in **BIO-10** and shall be included in reports described therein. Within 90 days after the anniversary of the start of Pre-Construction Site Mobilization, the project owner shall provide to the CPM verification of the numbers or acreage of plants covered in this Condition (i.e., species named in BLM and County policies) which have been removed or salvaged over the course of the year. Annual revegetation reports described in **BIO-10** verification shall include summaries of salvage and planting operations and monitoring results. Compliance reports shall include summaries of written and photographic records of the plan implementation described above. Compliance reports shall be submitted annually for a period not less than 5 years to document irrigation, maintenance, and monitoring results, including plant survival.

MOJAVE FRINGE-TOED LIZARD MITIGATION

BIO-13 The project owner shall provide compensatory land to mitigate for habitat loss and direct impacts to Mojave fringe-toed lizards based on revised

estimates of suitable Mojave fringe-toed lizard habitat on-site, to be verified by an expert in this animal's ecology. The project owner shall provide compensatory mitigation at a 3:1 ratio for impacts to breeding habitat (i.e., dune, sand ramp, or fine-sandy wash habitat), and at a 1:1 ratio for impacts to adjacent suitable foraging and cover habitat, such as thin aeolian sand overlying bajada surfaces, or foraging habitat surrounding the breeding habitat. Staff estimates breeding habitat on site as 21.4 acres, and surrounding suitable foraging and cover habitat (i.e., 45 meter buffer) as 143.3 acres. Therefore, staff concludes this condition would require the acquisition and dedication in perpetuity of 207.5 acres of habitat. The project owner shall provide funding for the acquisition, initial habitat improvements, and long-term management of the compensation lands, as described below.

Biological Resources Table 17
Mojave Fringe-toed Lizard Compensation Acreage Summary

Habitat Function	Project Impact Acreage	Mitigation Ratio	Compensation Acreage
Foraging and cover	143.3 acres	1:1	143.3 acres
Breeding	21.4 acres	3:1	64.2 acres
Total	164.7 acres		207.5 acres

This compensation acreage may be included ("nested") within the acreage acquired and managed as desert tortoise habitat compensation (Condition of Certification **BIO-17)** only if:

- Adequate acreage of qualifying desert tortoise compensation lands also meet the Selection Criteria (below) as habitat for Mojave fringe-toed lizard;
- The desert tortoise habitat compensation lands are acquired and dedicated as permanent conservation lands within 18 months of the start of Pre-Construction Site Mobilization.

If these two criteria are not met, then the project owner shall provide the required number of acres of Mojave fringe-toed lizard habitat compensation lands, adjusted to reflect the final project footprint and additional delineation of suitable habitat, independent of any compensation land required under other conditions of certification, and shall also provide funding for the initial improvement and long-term maintenance and management of the acquired lands, and shall comply with other related requirements this condition. Costs of these requirements are estimated to be $674,211.24 based on the acquisition of 207.5 acres (see **Revised Biological Resources Tables 5** and **6** for a complete breakdown of estimated costs). Regardless of actual cost, the project owner shall be responsible for funding all requirements of this condition.

The project owner shall provide financial assurances as described below, in the amount of $660,416.25. In lieu of acquiring lands itself, the Project owner may satisfy the requirements of this condition by providing funds for the acquisition to the Renewable Energy Action Team (REAT) Account established with the National Fish and

Wildlife Foundation (NFWF), as described below. If the Project owner elects to establish a REAT NFWF Account and have NFWF and the resource agencies complete the required habitat compensation, then the total estimated cost of complying with this condition is $674,211.24. The amount of security or NFWF deposit shall be adjusted up or down to reflect any revised cost estimates recommended by REAT.

The actual costs to comply with this condition will vary depending on the final footprint of the Project, the actual costs of acquiring compensation habitat, the costs of initially improving the habitat, and the actual costs of long-term management as determined by a Property Analysis Report (below). The 207.5 acre habitat requirement, and associated funding requirements based on that acreage, shall be adjusted up or down if there are changes in the final footprint of the project or the associated costs of evaluation, acquisition, management, and other factors listed in **Revised Biological Resources Tables 5** and **6.** Regardless of actual cost, the project owner shall be responsible for implementing all aspects of this condition.

COMPENSATORY MITIGATION LAND ACQUISITION

1. Method of Acquisition. Compensation lands shall be acquired by either of the two options listed below. Regardless of the method of acquisition, the transaction shall be complete only upon completion of all terms and conditions described in this Condition of Certification.

a. The project owner shall acquire lands and transfer title and/or conservation easement to a state or federal land management agency or to a third-party non-profit land management organization, as approved by the CPM in consultation with BLM, CDFG, and USFWS; or

b. The Project owner shall deposit funds into a project-specific subaccount within the REAT Account established with the NFWF, in the amount as indicated in **Revised Biological Resources Tables 5** and **6** (adjusted to reflect final project footprint and any applicable REAT adjustments to costs).

2. Selection Criteria for Compensation Lands. The compensation lands selected for acquisition to meet Energy Commission requirements shall:

a. Be sand dune or partially stabilized sand dune habitat with potential to contribute to Mojave fringe-toed lizard habitat connectivity and build linkages between known populations of Mojave fringe-toed lizards and preserve lands with suitable habitat;

b. Be biologically contiguous to lands currently occupied by Mojave fringe-toed lizard;

c. Be near larger blocks of lands that are either already protected or planned for protection, or which could feasibly be protected long-term by a public resource agency or a non-governmental organization dedicated to habitat preservation;

d. Provide quality habitat for Mojave fringe-toed lizard, that has the capacity to

regenerate naturally when disturbances are removed;

e. Not have a history of intensive recreational use or other disturbance that might make habitat recovery and restoration infeasible;

f. Not be characterized by high densities of invasive species, either on or immediately adjacent to the parcels under consideration, that might jeopardize habitat recovery and restoration;

g. Not contain hazardous wastes;

h. Have water and mineral rights included as part of the acquisition, unless the CPM, in consultation with CDFG, BLM and USFWS, agrees in writing to the acceptability of land without these rights; and

i. Be on land for which long-term habitat management for Mojave fringe-toed lizard and other native biological resources is feasible.

3. Review and Approval of Compensation Lands Prior to Acquisition. The project owner shall submit a formal acquisition proposal to the CPM describing the parcel(s) intended for purchase. This acquisition proposal shall discuss the suitability of the proposed parcel(s) as compensation lands for Mojave fringe-toed lizard in relation to the criteria listed above and must be approved by the CPM. The CPM will share the proposal with and consult with CDFG, BLM, and the USFWS before deciding whether to approve or disapprove the proposed acquisition.

4. Compensation Lands Acquisition Conditions: The project owner shall comply with the following conditions relating to acquisition of the compensation lands after the CPM, in consultation with CDFG, BLM and the USFWS, have approved the proposed compensation lands:

a. Preliminary Report: The Project owner, or approved third party, shall provide a recent preliminary title report, initial hazardous materials survey report, biological analysis, and other necessary or requested documents for the proposed compensation land to the CPM. All documents conveying or conserving compensation lands and all conditions of title are subject to review and approval by the CPM, in consultation with CDFG, BLM and the USFWS. For conveyances to the State, approval may also be required from the California Department of General Services, the Fish and Game Commission and the Wildlife Conservation Board.

b. Title/Conveyance: The Project owner shall acquire and transfer fee title to the compensation lands, a conservation easement over the lands, or both fee title and conservation easement as required by the CPM in consultation with CDFG. Any transfer of a conservation easement or fee title must be to CDFG, a non-profit organization qualified to hold title to and manage compensation lands (pursuant to California Government Code section 65965), or to BLM or other public agency approved by the CPM in consultation with CDFG. If an approved non-profit organization holds fee title to the compensation lands, a conservation easement shall be recorded in favor of CDFG or another entity approved by the

CPM. If an approved non-profit holds a conservation easement, CDFG shall be named a third party beneficiary. If an entity other than CDFG holds a conservation easement over the compensation lands, the CPM may require that CDFG or another entity approved by the CPM, in consultation with CDFG, be named a third party beneficiary of the conservation easement. The Project owner shall obtain approval of the CPM, in consultation with CDFG, of the terms of any transfer of fee title or conservation easement to the compensation lands.

c. Property Analysis Record: Upon identification of the compensation lands, the Project owner shall conduct a Property Analysis Record (PAR) or PAR-like analysis to establish the appropriate amount of the long-term maintenance and management fund to pay the in-perpetuity management of the compensation lands. The PAR or PAR-like analysis must be approved by the CPM, in consultation with CDFG, before it can be used to establish funding levels or management activities for the compensation lands.

5. Compensation Lands Acquisition Costs: The Project owner shall pay all other costs related to acquisition of compensation lands and conservation easements. In addition to actual land costs, these acquisition costs shall include but shall not be limited to the items listed below. Management costs including site cleanup measures are described separately, in the following section.

   a. Level 1 Environmental Site Assessment;

   b. Appraisal;

   c. Title and document review costs;

   d. Expenses incurred from other state, federal, or local agency reviews;

   e. Closing and escrow costs;

   f. Overhead costs related to providing compensation lands to CDFG or an approved third party;

   g. Biological survey(s) to determine mitigation value of the land; and

   h. Agency costs to accept the land (e.g., writing and recording of conservation easements; title transfer).

COMPENSATORY MITIGATION LAND IMPROVEMENT

1. Land Improvement Requirements: The Project owner shall fund activities that the CPM, in consultation with the CDFG, USFWS and BLM, requires for the initial protection and habitat improvement of the compensation lands. These activities will vary depending on the condition and location of the land acquired, but may include surveys of boundaries and property lines, installation of signs, trash removal and other site cleanup measures, construction and repair of fences, invasive plant removal, removal of roads, and similar measures to protect habitat and improve habitat quality on the compensation lands.

   The costs of these activities are estimated at $250 an acre, but will vary depending on the measures that are required for the compensation lands. A non-profit

organization, CDFG or another public agency may hold and expend the habitat improvement funds if it is qualified to manage the compensation lands (pursuant to California Government Code section 65965), if it meets the approval of the CPM in consultation with CDFG, and if it is authorized to participate in implementing the required activities on the compensation lands. If CDFG takes fee title to the compensation lands, the habitat improvement fund must be paid to CDFG or its designee.

COMPENSATORY MITIGATION LAND LONG-TERM MANAGEMENT

1. Long-term Management Requirements: Long-term management is required to ensure that the compensation lands are managed and maintained to protect and enhance habitat for Mojave fringe-toed lizard. Management activities may include maintenance of signs, fences, removal of invasive weeds, monitoring, security and enforcement, and control or elimination of unauthorized use.

2. Long-term Management Plan. The project owner shall pay for the preparation of a Management Plan for the compensation lands. The Management Plan shall reflect site-specific enhancement measures on the acquired compensation lands. The plan shall be submitted for approval of the CPM, in consultation with CDFG, BLM and USFWS.

3. Long-Term Maintenance and Management Funding. The Project owner shall provide money to establish an account with a long-term maintenance and management. that will be used to fund the longterm maintenance and management of the compensation lands. The amount of money to be paid will be determined through an approved PAR or PAR-like analysis conducted for the compensation lands. The amount of required funding is initially estimated to be $1,450 for every acre of compensation lands. If compensation lands will not be identified and a PAR or PAR-like analysis completed within the time period specified for this payment (see the verification section at the end of this condition), the project owner shall provide initial payment of $1,450 an acre for the acres identified in the verified and approved delineation of habitat required by this condition, or if the delineation is not completed, shall provide $300,875 calculated at $1,450 an acre for 207.5 acres into an account for long-term maintenance and management of compensation lands. The amount of the required initial payment or security for this item shall be adjusted for any change in the Project footprint as described above. If an initial payment is made based on the estimated per-acre costs, the project owner shall deposit additional money as may be needed to provide the full amount of long-term maintenance and management funding indicated by a PAR or PAR-like analysis, once the analysis is completed and approved. If the approved analysis indicates less than $1,450 an acre will be required for long-term maintenance and management, the excess paid will be returned to the Project owner.

   The project owner must obtain the CPM's approval of the entity that will receive and hold the long-term maintenance and management fund for the compensation lands. The CPM will consult with CDFG before deciding whether to approve an entity to hold the project's long-term maintenance and management funds. The CPM, in consultation with CDFG, may designate another non-profit organization to hold

the long-term maintenance and management fee if the organization is qualified to manage the compensation lands in perpetuity.

If CDFG takes fee title to the compensation lands, CDFG shall determine whether it will hold the long-term management fee in the special deposit fund, leave the money in the REAT Account, or designate another entity to manage the long-term maintenance and management fee for CDFG and with CDFG supervision.

The Project owner shall ensure that an agreement is in place with the long-term maintenance and management fee holder/manager to ensure the following conditions:

i. Interest. Interest generated from the initial capital shall be available for reinvestment into the principal and for the long-term operation, management, and protection of the approved compensation lands, including reasonable administrative overhead, biological monitoring, improvements to carrying capacity, law enforcement measures, and any other action designed to protect or improve the habitat values of the compensation lands.

ii. Withdrawal of Principal. The long-term maintenance and management fee principal shall not be drawn upon unless such withdrawal is deemed necessary by the CPM, in consultation with CDFG, or the approved third-party long-term maintenance and management fee manager to ensure the continued viability of the species on the compensation lands. If CDFG takes fee title to the compensation lands, monies received by CDFG pursuant to this provision shall be deposited in a special deposit fund established solely for the purpose to manage lands in perpetuity unless CDFG designates NFWF or another entity to manage the longterm maintenance and management fee for CDFG.

iii. Pooling Funds. A CPM-approved non-profit organization qualified to hold long-term maintenance and management fees solely for the purpose to manage lands in perpetuity, may pool the fund with other funds for the operation, management, and protection of the compensation lands for local populations of Mojave fringe-toed lizard. However, for reporting purposes, the long-term maintenance and management fee fund must be tracked and reported individually to the CPM.

iv. Reimbursement Fund. The project owner shall provide reimbursement to CDFG or an approved third party for reasonable expenses incurred during title, easement, and documentation review; expenses incurred from other State or State-approved federal agency reviews; and overhead related to providing compensation lands.

COMPENSATORY MITIGATION LAND SECURITY

1. Compensation Mitigation Security: The project owner shall provide security sufficient for funding acquisition, improvement, and longterm management of Mojave fringe-toed lizard compensation land. Financial assurance can be provided to the CPM in the form of an irrevocable letter of credit, a pledged savings account or another form of security ("Security"). Prior to submitting the Security to the CPM, the Project owner shall obtain the CPM's approval, in consultation with CDFG, BLM and the USFWS, of the form of the Security.

The security amount shall be based on the estimates provided in **Revised Biological Resources Tables 5** and **6.** This amount shall be updated and verified prior to payment and shall be adjusted to reflect actual costs or more current estimates as agreed upon by the REAT agencies.

The Project owner shall provide verification that financial assurances have been established to the CPM with copies of the document(s) to BLM, CDFG and the USFWS, to guarantee that an adequate level of funding is available to implement any of the mitigation measures required by this condition that are not completed prior to the start of ground-disturbing activities described in Section A of this condition.

In the event that the project owner defaults on the Security, the CPM may use money from the Security solely for implementation of the requirements of this condition. The CPM's use of the security to implement measures in this condition may not fully satisfy the Project owner's obligations under this condition. Any amount of the Security that is not used to carry out mitigation shall be returned to the Project owner upon successful completion of the associated requirements in this condition.

Security for the requirements of this condition shall be provided in the amount of $660,416.25 (or $674,211.24 if the project owner elects to use the REAT Account with NFWF pursuant to paragraph 4 of this condition, below). The Security is calculated in part from the items that follow but adjusted as specified below (consult **Revised Biological Resources Tables 5** and **6** for the complete breakdown of estimated costs). However, regardless of the amount of the security or actual cost of implementation, the project owner shall be responsible for implementing all aspects of this condition.

i. land acquisition costs for compensation land, calculated at $1,000/acre;

ii. Site assessments, appraisals, biological surveys, transaction closing and escrow costs, calculated as $18,000 total per parcel (presuming 320 acres per parcel);

iii. Initial site clean-up, restoration, or enhancement, calculated at $250/acre;

iv. Third-party and agency administrative transaction costs and overhead, calculated as percentages of land cost;

v. Long-term management and maintenance fund, calculated at $1,450 per acre; vi. NFWF fees to establish a project-specific account; manage the sub-account for acquisition and initial site work; and manage the sub-account for long term management and maintenance.

2. Phasing of Security Payment: Compensatory Mitigation Land Security may be phased according to phasing of the project's approval and construction. Phasing of compensation funding shall be based upon land disturbance and habit impacts for each project phase. Phasing of the mitigation payment is described further in staff's recommended Condition of Certification **BIO-31.**

3. The project owner may elect to comply with some or all of the requirements in this condition by providing funds to implement the requirements into the Renewable Energy Action Team (REAT) Account established with the National Fish and Wildlife Foundation (NFWF). To use this option, the Project owner must make an initial deposit to the REAT Account in an amount equal to the estimated costs of implementing the requirement (as set forth in the Security section of this condition, paragraph 3, above). If the actual cost of the acquisition, initial protection and habitat improvements, long-term funding or other cost is more than the estimated amount initially paid by the project owner, the project owner shall make an additional deposit into the REAT Account sufficient to cover the actual acquisition costs, the actual costs of initial protection and habitat improvement on the compensation lands, the long-term funding requirements as established in an approved PAR or PAR-like analysis, or the other actual costs that are estimated in the table. If those actual costs or PAR projections are less than the amount initially transferred by the project owner, the remaining balance shall be returned to the project owner.

4. The responsibility for acquisition of compensation lands may be delegated to a third party other than NFWF, such as a nongovernmental organization supportive of desert habitat conservation, by written agreement of the Energy Commission. Such delegation shall be subject to approval by the CPM, in consultation with CDFG, BLM and USFWS, prior to land acquisition, enhancement or management activities. Agreements to delegate land acquisition to an approved third party, or to manage compensation lands, shall be executed and implemented within 18 months of the Energy Commission's certification of the project.

5. The project owner may request the CPM to provide it with all available information about any funds held by the Energy Commission, CDFG, or NFWF as project security, or funds held in a NFWF sub-account for this project, or other project-specific account held by a third party. The CPM shall also fully cooperate with any independent audit that the project owner may choose to perform on any of these funds.

Verification: The project owner shall provide the CPM with written notice of intent to start ground disturbance at least 30 days prior to the start of Pre-Construction Site Mobilization.

If the mitigation actions required under this condition are not completed at least 30 days prior to the start of any phase of Pre-Construction Site Mobilization, the Project owner shall provide the CPM and CDFG with an approved Security for such phase in accordance with this condition of certification no later than 30 days prior to start of Pre-Construction Site Mobilization for such phase. Prior to submitting the Security to the CPM, the project owner shall obtain the CPM's approval, in consultation with CDFG, BLM and the USFWS, of the form of the Security. The project owner, or an approved third party, shall complete and provide written verification to the CPM, CDFG, BLM and USFWS of the compensation lands acquisition and transfer within 18 months of the start of Pre-Construction Site Mobilization.

No later than 12 months after the start of any phase of Pre-Construction Site Mobilization, the project owner shall submit a formal acquisition proposal to the CPM describing the parcels intended for purchase, and shall obtain approval from the CPM, in consultation with CDFG, BLM and USFWS, prior to the acquisition. If NFWF or another approved third party is handling the acquisition, the project owner shall fully cooperate with the third party to ensure the proposal is submitted within this time period. The project owner or an approved third party shall complete the acquisition and all required transfers of the compensation lands, and provide written verification to the CPM, CDFG, BLM and USFWS of such completion, no later than 18 months after the start of Pre-Construction Site Mobilization. If NFWF or another approved third party is being used for the acquisition, the project owner shall ensure that funds needed to accomplish the acquisition are transferred in timely manner to facilitate the planned acquisition and to ensure the land can be acquired and transferred prior to the 18-month deadline.

The project owner shall complete and submit to the CPM a PAR or PAR-like analysis no later than 60 days after the CPM approves compensation lands for acquisition associated with any phase of construction. The project owner shall fully fund the required amount for long-term maintenance and management of the compensation lands for that phase of construction no later than 30 days after the CPM approves a PAR or PAR-like analysis of the anticipated long-term maintenance and management costs of the compensation lands. Written verification shall be provided to the CPM and CDFG to confirm payment of the long-term maintenance and management funds.

No later than 60 days after the CPM determines what activities are required to provide for initial protection and habitat improvement on the compensation lands for any phase of construction, the project owner shall make funding available for those activities and provide written verification to the CPM of what funds are available and how costs will be paid. Initial protection and habitat improvement activities on the compensation lands for that phase of construction shall be completed, and written verification provided to the CPM, no later than six months after the CPM's determination of what activities are required on the compensation lands.

The project owner, or an approved third party, shall provide the CPM, CDFG, BLM and USFWS with a management plan for the compensation lands associated with any phase of construction within180 days of the land or easement purchase, as determined by the date on the title. The CPM, in consultation with CDFG, BLM and the USFWS, shall approve the management plan after its content is acceptable to the CPM.

Within 90 days after completion of Pre-Construction Site Mobilization, the project owner shall provide to the CPM, CDFG, BLM and USFWS an analysis, based on aerial photography, with the final accounting of the amount of habitat disturbed during Project construction. This shall be the basis for the final number of acres required to be acquired.

GILA MONSTER MITIGATION

BIO-14 Concurrent with Desert Tortoise Clearance surveys (**BIO-15,** below), the project owner shall conduct pre-construction surveys for Gila monsters. If a Gila monster is encountered during clearance surveys or during construction, a qualified biologist experienced with Gila monster survey and capture techniques shall capture and maintain it in a cool (85 degrees F) environment until it can be released to a safe, suitable area beyond the construction impact zone. The biologist shall coordinate with staff and CDFG biologists in the transport and relocation of any Gila monsters encountered during project surveys, construction, or operation. A written report documenting any Gila monsters relocated shall be provided to the CPM within 30 days of relocation.

Verification: Within 30 days after completion of clearance surveys the Designated Biologist shall submit a report to BLM's Wildlife Biologist, the CPM, USFWS, and CDFG describing implementation and results, including description of any relocation of Gila monsters. The report shall include the number of Gila monsters moved; their state of health, including wounds or visible signs of illness; and the location of relocation.

DESERT TORTOISE CLEARANCE SURVEYS AND EXCLUSION FENCING

BIO-15 The project owner shall undertake appropriate measures to manage the construction site and related facilities in a manner to avoid or minimize impacts to desert tortoise. Methods for clearance surveys, fence specification and installation, tortoise handling, artificial burrow construction, egg handling and other procedures shall be consistent with those described in the USFWS' 2009 *Desert Tortoise Field Manual* http://www.fws.gov/ventura/speciesinfo/protocols_guidelines or more current guidance provided by CDFG and USFWS. The project owner shall also implement all terms and conditions described in the Biological Opinion for the Project prepared by USFWS. These measures include, but are not limited to, the following:

1. Desert Tortoise Exclusion Fence Installation. To avoid impacts to desert tortoises, permanent desert tortoise exclusion fencing shall be installed along the permanent perimeter security fence and temporarily installed along the utility corridors at tower locations, laydown areas, or other staging areas. Tortoise exclusion fencing shall also be installed as necessary to prevent tortoises on the southern NAP (not a part) area (between the project site and Interstate-40) to prevent tortoises from entering the highway. If the culvert areas cannot be fenced due to restrictions associated with highway maintenance, the two tortoises would be translocated off the site (see **BIO-16).** The proposed alignments for the permanent perimeter fence and utility rights-of-way fencing shall be flagged and surveyed within 24 hours prior to the initiation of fence construction. Clearance surveys of the perimeter fence and utility rights-of-way alignments shall be conducted by the Designated Biologist(s) using techniques approved by the USFWS and CDFG and may be

conducted in any season with USFWS and CDFG approval. Biological Monitors may assist the Designated Biologist under his or her supervision with the approval of the CPM, BLM, USFWS, and CDFG. These fence clearance surveys shall provide 100-percent coverage of all areas to be disturbed and an additional transect along both sides of the fence line. This fence line transect shall cover an area approximately 90 feet wide centered on the fence alignment. Transects shall be no greater than 15 feet apart. All desert tortoise burrows, and burrows constructed by other species that might be used by desert tortoises, shall be examined to assess occupancy of each burrow by desert tortoises and handled in accordance with the USFWS' 2009 *Desert Tortoise Field Manual.* Any desert tortoise located during fence clearance surveys shall be handled by the Designated Biologist(s) in accordance with the USFWS' 2009 *Desert Tortoise Field Manual.*

a. Timing, Supervision of Fence Installation. The exclusion fencing shall be installed prior to the onset of site clearing and grubbing. Fencing shall also be placed along both sides of any construction access roads within tortoise habitat but outside the fenced construction area, and maintained throughout the construction phase of the project, unless otherwise approved by the CPM, BLM Wildlife Biologist, USFWS, and CDFG. The fence installation shall be supervised by the Designated Biologist and monitored by the Biological Monitors to ensure the safety of any tortoise present.

b. Fence Material and Installation. The permanent tortoise exclusionary fencing shall be constructed in accordance with the USFWS' 2009 *Desert Tortoise Field Manual* (Chapter 8 – Desert Tortoise Exclusion Fence).

c. Security Gates. Security gates shall be designed with minimal ground clearance to deter ingress by tortoises. The gates may be electronically activated to open and close immediately after the vehicle(s) have entered or exited to prevent the gates from being kept open for long periods of time. Cattle grating designed to safely exclude desert tortoise shall be installed at the gated entries to discourage tortoises from gaining entry.

d. Fence Inspections. Following installation of the desert tortoise exclusion fencing for both the permanent site fencing and temporary fencing in the utility corridors, the fencing shall be regularly inspected. If tortoise were moved out of harm's way during fence construction, permanent and temporary fencing shall be inspected at least two times a day for the first 7 days to ensure a recently moved tortoise has not been trapped within the fence. Thereafter, permanent fencing shall be inspected monthly and during and within 24 hours following all major rainfall events. A major rainfall event is defined as one for which surface flow is detectable within the fenced drainage during the storm, or for which channels on-site show any evidence of newly deposited sediments, bank erosion, or channel reworking following the storm. The project owner shall be responsible for monitoring storm flows and changes to channels to evaluate need for fence inspection. Any damage to the fencing shall be temporarily repaired immediately to keep tortoises out of the site, and permanently

repaired within 48 hours of observing damage. Inspections of permanent site fencing shall occur for the life of the project. Temporary fencing shall be inspected weekly and, where drainages intersect the fencing, during and within 24 hours following major rainfall events. All temporary fencing shall be repaired immediately upon discovery and, if the fence may have permitted tortoise entry while damaged, the Designated Biologist shall inspect the area for tortoise.

e. Derailment or other emergency. In the case of derailment or other emergency, project owner is required to provide BNSF access to the Project site for emergency response. This access may include, among other activities, temporary removal of portions of the desert tortoise exclusionary fencing, the immediate placement of a temporary fence and the placement of the applicable portion of the permanent fence within 48 hours of the temporary removal of such portion.

2. Desert Tortoise Clearance Surveys within the Plant Site. Following construction of the permanent perimeter security fence and the attached tortoise exclusion fence, the permanently fenced power plant site shall be cleared of tortoises by the Designated Biologist, who may be assisted by the Biological Monitors. Clearance surveys shall be conducted in accordance with the USFWS' 2009 *Desert Tortoise Field Manual* (Chapter 6 – Clearance Survey Protocol for the Desert Tortoise – Mojave Population) and shall consist of two surveys covering 100 percent the project area by walking transects no more than 15-feet apart. If a desert tortoise is located on the second survey, a third survey shall be conducted. Each separate survey shall be walked in a different direction to allow opposing angles of observation. Clearance surveys of the power plant site may only be conducted when tortoises are most active (April through May or September through October). Surveys outside of these time periods require approval by USFWS and CDFG. Any tortoise located during clearance surveys of the power plant site shall be relocated and monitored in accordance with the Desert Tortoise Translocation Plan (Condition of Certification **BIO-1 6).**

a. Burrow Searches. During clearance surveys all desert tortoise burrows, and burrows constructed by other species that might be used by desert tortoises, shall be examined by the Designated Biologist, who may be assisted by the Biological Monitors, to assess occupancy of each burrow by desert tortoises and handled in accordance with the USFWS' 2009 *Desert Tortoise Field Manual.* To prevent reentry by a tortoise or other wildlife, all burrows shall be collapsed once absence has been determined. Tortoises taken from burrows and from elsewhere on the power plant site shall be translocated as described in the Desert Tortoise Translocation Plan.

b. Burrow Excavation/Handling. All potential desert tortoise burrows located during clearance surveys would be excavated by hand, tortoises removed, and collapsed or blocked to prevent occupation by desert tortoises. All desert tortoise handling and removal, and burrow excavations, including nests, would be conducted by the Designated Biologist, who may be assisted by a Biological Monitor in accordance with the USFWS' 2009 *Desert Tortoise Field Manual.*

3. Monitoring Following Clearing. Following the desert tortoise clearance and removal from the power plant site and utility corridors and initial memo or verbal completion report shall be sent to BLM's Wildlife Biologist, the CPM, USFWS, and CDFG (see item 4 below), workers and heavy equipment shall be allowed to enter the project site to perform clearing, grubbing, leveling, and trenching. A Designated Biologist shall monitor clearing and grading activities to find and move tortoises missed during the initial tortoise clearance survey. Should a tortoise be discovered, it shall be translocated as described in the Desert Tortoise Translocation Plan to an area approved by the Designated Biologist.

4. Reporting. The Designated Biologist shall record the following information for any desert tortoises handled: a) the locations (narrative and maps) and dates of observation; b) general condition and health, including injuries, state of healing and whether desert tortoise voided their bladders; c) location moved from and location moved to (using GPS technology); d) gender, carapace length, and diagnostic markings (i.e., identification numbers or marked lateral scutes); e) ambient temperature when handled and released; and f) digital photograph of each handled desert tortoise as described in the paragraph below. Desert tortoise moved from within project areas shall be marked and monitored in accordance with the Desert Tortoise Translocation Plan.

Verification: All mitigation measures and their implementation methods shall be included in the BRMIMP and implemented. Implementation of the measures shall be reported in the Monthly Compliance Reports by the Designated Biologist. Immediately upon completion of clearance surveys and desert tortoise removal from the site, the Designated Biologist shall provide an initial memo or verbal report of the results to BLM's Wildlife Biologist, the CPM, USFWS, and CDFG. Within 30 days after completion of desert tortoise clearance surveys the Designated Biologist shall submit a report to BLM's Wildlife Biologist, the CPM, USFWS, and CDFG describing implementation of each of the mitigation measures listed above**.** The report shall include the desert tortoise survey results, capture and release locations of any relocated desert tortoises, and any other information needed to demonstrate compliance with the measures described above.

DESERT TORTOISE TRANSLOCATION PLAN

BIO-16 The project owner shall develop and implement a final Desert Tortoise Translocation Plan (Plan) in conformance with standards and guidelines described in *Translocation of Desert Tortoises (Mojave Population) From Project Sites: Plan Development Guidance* (USFWS 2010), any more current guidance or recommendations as available from CDFG or USFWS, and meets the approval of USFWS, CDFG, BLM's Wildlife Biologist and the CPM. The goal of the Plan shall be to safely exclude desert tortoises from within the fenced project area and translocate them to suitable habitat capable of supporting them, while minimizing stress and potential for disease transmission. Tortoises to be moved farther than 500 meters shall be tested for disease prior to translocation. The Plan shall include written

correspondence with CalTrans indicating whether tortoise exclusion fencing may be installed to prevent tortoises on the southern NAP area (between the project site and Interstate-40) to prevent tortoises from entering the highway. If CalTrans does not permit that fencing, then desert tortoises shall be translocated off the NAP site (see **BIO-15).** The final Plan shall be based on the draft Desert Tortoise Translocation Plan prepared by the applicant and shall include all revisions deemed necessary by USFWS, CDFG, BLM'S Wildlife Biologist, and staff. The Plan shall include but not be limited to, a list of the authorized handlers, protocols for disease testing and assessing tortoise health, proposed translocation locations and procedures, schedule of translocations, a habitat assessment of translocation lands, monitoring and reporting, and contingency planning (e.g., handling an injured or diseased tortoise).

Verification: At least 30 days prior to the start of Pre-Construction Site Mobilization, the project owner shall provide BLM's Wildlife Biologist and the CPM with the final version of a Desert Tortoise Translocation Plan that has been reviewed and approved by BLM's Wildlife Biologist and the CPM in consultation with USFWS and CDFG. The plan shall include the locations of the translocation sites. The project owner may not translocate more than 98 tortoises unless the project owner first provides the CPM with documentation demonstrating that adequate translocation sites have been identified, and obtains CPM approval of those translocation sites. All modifications to the approved Plan shall be made only after approval by BLM's Wildlife Biologist and the CPM, in consultation with USFWS and CDFG. Within 30 days after initiation of translocation activities, the Designated Biologist shall provide to BLM's Wildlife Biologist and the CPM for review and approval, a written report identifying which items of the Plan have been completed, and a summary of all modifications to measures made during implementation of the Plan. Written monthly progress reports shall be provided to the BLM's Wildlife Biologist and CPM for the duration of the Plan implementation, including the duration of monitoring of translocated tortoises.

DESERT TORTOISE COMPENSATORY MITIGATION

BIO-17 The project owner shall provide compensatory mitigation acreage of 10,302 acres of desert tortoise habitat lands, adjusted to reflect the final project footprint, as specified in this condition. In addition, the project owner shall provide funding for initial improvement and long term maintenance, enhancement, and management of the acquired lands for protection and enhancement of desert tortoise populations, and comply with other related requirements of this condition. This acreage was calculated as follows: a ratio of 1:1 for the project area south of the BNSF railroad tracks (2,140 acres); a ratio of 3:1 ratio for 2,104 acres of the project area north of the BNSF railroad tracks; and a ratio of 5:1 for 370 additional acres north of the BNSF railroad tracks. See **Table,** below.

Desert Tortoise Compensation Acreage Summary:

Location	Project Impact Acreage	Mitigation Ratio	Compensation Acreage

South of BNSF RR	2,140 acres	1:1	2,140 acres
Immeditately North of BNSF RR acreage)	2.,104 acres	3:1	6,312 acres
Far North of BNSF RR)	370 acres	5:1	1,850 acres
Total for Project	**4,613 acres**		**10,302 acres**

Costs of these requirements are estimated to be $31,079,934.00 for the Project (see Ex. 317, **Biological Resources Addendum Tables 5** and **7** for a complete breakdown of costs and acreage).

As many as 4,613 acres of the compensation lands requirement may be satisfied by project owner's compliance with the desert tortoise habitat acquisition or enhancement requirements of BLM, to be calculated as an acre-for-acre offset in the Energy Commission requirement for mitigation provided to satisfy BLM's requirements. For purposes of this paragraph, credit will be given for BLM-required mitigation without regard to whether BLM uses the mitigation funds for habitat acquisition or for enhancement projects to benefit the species.

These impact acreages shall be adjusted to reflect the final project footprint. For purposes of this condition, the Project footprint means all lands disturbed in the construction and operation of the Calico Solar Project, including all linear project components, as well as all undeveloped areas inside the Project's boundaries.

The project owner shall provide financial assurances as described below in the amount of $31,079,934.00. In lieu of acquiring lands itself, the Project owner may satisfy the requirements of this condition by depositing funds into a Renewable Energy Action Team (REAT) Account established with the National Fish and Wildlife Foundation (NFWF), as described below. If the Project owner elects to establish a REAT NFWF Account and have NFWF and the agencies complete the required habitat compensation, then the total estimated cost of complying with this condition is $31,755,574.02. The amount of security or NFWF deposit shall be adjusted up or down to reflect any revised cost estimates recommended by REAT.

The actual costs to comply with this condition will vary depending on the final footprint of the Project, the costs of acquiring compensation habitat, the costs of initially improving the habitat, and the actual costs of long-term management as determined by a Property Analysis Report or similar analysis (below). The 4,613 acre habitat requirement, and associated funding requirements based on that acreage, shall be adjusted up or down if there are changes in the final footprint of the project or the associated costs of evaluation, acquisition, management, and other factors listed in **Biological Resources Addendum Tables 5** and **7.** Regardless of actual cost, the project owner shall be responsible for funding all requirements of this condition.

COMPENSATORY MITIGATION LAND ACQUISITION

1. Method of Acquisition. Compensation lands shall be acquired by either of the two options listed below. Regardless of the method of acquisition, the transaction shall be complete only upon completion of all terms and conditions described in this Condition of Certification.

a. The project owner shall acquire lands and transfer title and/or conservation easement to a state or federal land management agency or to a third-party non-profit land management organization, as approved by the CPM in consultation with BLM, CDFG, and USFWS; or

b. The Project owner shall deposit funds into a project-specific subaccount within the REAT Account established with the NFWF, in the amount as indicated in **Biological Resources Addendum Tables 5** and **7** (adjusted to reflect final project footprint and any applicable REAT adjustments to costs).

2. Selection Criteria for Compensation Lands. The compensation lands selected for acquisition to meet Energy Commission and CESA requirements shall be equal to or better than the quality and function of the habitat impacted and:

a. be within the Western Mojave Recovery Unit, with potential to contribute to desert tortoise habitat connectivity and build linkages between desert tortoise designated critical habitat, known populations of desert tortoise, and/or other preserve lands; provide habitat for desert tortoise with capacity to regenerate naturally when disturbances are removed;

b. be near larger blocks of lands that are either already protected or planned for protection, or which could feasibly be protected long-term by a public resource agency or a nongovernmental organization dedicated to habitat preservation;

c. be contiguous and biologically connected to lands currently occupied by desert tortoise, ideally with populations that are stable, recovering, or likely to recover;

d. not have a history of intensive recreational use or other disturbance that might cause future erosional damage or other habitat damage, and make habitat recovery and restoration infeasible;

e. not be characterized by high densities of invasive species, either on or immediately adjacent to the parcels under consideration, that might jeopardize habitat recovery and restoration; and

f. not contain hazardous wastes that cannot be removed to the extent that the site could not provide suitable habitat; and

h. have water and mineral rights included as part of the acquisition, unless the CPM, in consultation with CDFG, BLM and USFWS, agrees in writing to the acceptability of land without these rights.

3. Review and Approval of Compensation Lands Prior to Acquisition. The project

owner shall submit a formal acquisition proposal to the CPM describing the parcel(s) intended for purchase. This acquisition proposal shall discuss the suitability of the proposed parcel(s) as compensation lands for desert tortoise in relation to the criteria listed above and must be approved by the CPM. The CPM will share the proposal with and consult with CDFG, BLM and the USFWS before deciding whether to approve or disapprove the proposed acquisition.

4. Compensation Lands Acquisition Conditions: The project owner shall comply with the following conditions relating to acquisition of the compensation lands after the CPM, in consultation with CDFG, BLM and the USFWS have approved the proposed compensation lands:

a. Preliminary Report: The Project owner, or approved third party, shall provide a recent preliminary title report, initial hazardous materials survey report, biological analysis, and other necessary or requested documents for the proposed compensation land to the CPM. All documents conveying or conserving compensation lands and all conditions of title are subject to review and approval by the CPM, in consultation with CDFG, BLM and the USFWS. For conveyances to the State, approval may also be required from the California Department of General Services, the Fish and Game Commission and the Wildlife Conservation Board.

b. Title/Conveyance: The Project owner shall acquire and transfer fee title to the compensation lands, a conservation easement over the lands, or both fee title and conservation easement as required by the CPM in consultation with CDFG. Any transfer of a conservation easement or fee title must be to CDFG, a non-profit organization qualified to hold title to and manage compensation lands (pursuant to California Government Code section 65965), or to BLM or other public agency approved by the CPM in consultation with CDFG. If an approved non-profit organization holds fee title to the compensation lands, a conservation easement shall be recorded in favor of CDFG or another entity approved by the CPM. If an approved non-profit holds a conservation easement, CDFG shall be named a third party beneficiary. If an entity other than CDFG holds a conservation easement over the compensation lands, the CPM may require that CDFG or another entity approved by the CPM, in consultation with CDFG, be named a third party beneficiary of the conservation easement. The Project owner shall obtain approval of the CPM, in consultation with CDFG, of the terms of any transfer of fee title or conservation easement to the compensation lands.

c. Property Analysis Record. Upon identification of the compensation lands, the Project owner shall conduct a Property Analysis Record (PAR) or PAR-like analysis to establish the appropriate amount of the long-term maintenance and management fund to pay the in-perpetuity management of the compensation lands. The PAR or PAR-like analysis must be approved by the CPM, in consultation with CDFG, before it can be used to establish funding levels or management activities for the compensation lands.

5. Compensation Lands Acquisition Costs: The Project owner shall pay all other costs related to acquisition of compensation lands and conservation easements.

In addition to actual land costs, these acquisition costs shall include but shall not be limited to the items listed below. Management costs including site cleanup measures are described separately, in the following section.

a. Level 1 Environmental Site Assessment;

b. Appraisal;

c. Title and document review costs;

e. Expenses incurred from other state, federal, or local agency reviews;

f. Closing and escrow costs;

g. Overhead costs related to providing compensation lands to CDFG or an approved third party;

h. Biological survey(s) to determine mitigation value of the land; and

i. Agency costs to accept the land (e.g., writing and recording of conservation easements; title transfer).

COMPENSATORY MITIGATION LAND IMPROVEMENT

1. Land Improvement Requirements: The Project owner shall fund activities that the CPM, in consultation with the CDFG, USFWS and BLM, requires for the initial protection and habitat improvement of the compensation lands. These activities will vary depending on the condition and location of the land acquired, but may include surveys of boundaries and property lines, installation of signs, trash removal and other site cleanup measures, construction and repair of fences, invasive plant removal, removal of roads, and similar measures to protect habitat and improve habitat quality on the compensation lands.

   The costs of these activities are estimated at $250 an acre, but will vary depending on the measures that are required for the compensation lands. A non-profit organization, CDFG or another public agency may hold and expend the habitat improvement funds if it is qualified to manage the compensation lands (pursuant to California Government Code section 65965), if it meets the approval of the CPM in consultation with CDFG, and if it is authorized to participate in implementing the required activities on the compensation lands. If CDFG takes fee title to the compensation lands, the habitat improvement fund must be paid to CDFG or its designee.

COMPENSATORY MITIGATION LAND LONG-TERM MANAGEMENT

1. Long-term Management Requirements: Long-term management is required to ensure that the compensation lands are managed and maintained to protect and enhance habitat for desert tortoise. Management activities may include maintenance of signs, fences, removal of invasive weeds, monitoring, security and enforcement, and control or elimination of unauthorized use.

2. Long-term Management Plan. The project owner shall pay for the preparation of a Management Plan for the compensation lands. The Management Plan shall reflect site-specific enhancement measures on the acquired compensation lands. The plan shall be submitted for approval of the CPM, in consultation with CDFG, BLM and USFWS.

3. Long-Term Maintenance and Management Funding. The Project owner shall provide money to establish an account with a long-term maintenance and management. that will be used to fund the long term maintenance and management of the compensation lands. The amount of money to be paid will be determined through an approved PAR or PAR-like analysis conducted for the compensation lands. The amount of required funding is initially estimated to be $1,450 for every acre of compensation lands. If compensation lands will not be identified and a PAR or PAR-like analysis completed within the time period specified for this payment (see the verification section at the end of this condition), the Project owner shall provide initial payment of $14,937,900.00 calculated at $1,450 an acre for each compensation acre, as shown in **Biological Resources Addendum Tables 5 and 7** (above into an account for long-term maintenance and management of compensation lands. The amount of the required initial payment or security for this item shall be adjusted for any change in the Project footprint as described above. If an initial payment is made based on the estimated per-acre costs, the project owner shall deposit additional money as may be needed to provide the full amount of long-term maintenance and management funding indicated by a PAR or PAR-like analysis, once the analysis is completed and approved. If the approved analysis indicates less than $1,450 an acre will be required for long-term maintenance and management, the excess paid will be returned to the Project owner.

   The project owner must obtain the CPM's approval of the entity that will receive and hold the long-term maintenance and management fund for the compensation lands. The CPM will consult with the project owner and CDFG before deciding whether to approve an entity to hold the project's long-term maintenance and management funds on any lands. The CPM, in consultation with the project owner and CDFG, may designate another state agency or nonprofit organization to hold the long-term maintenance and management fee if the organization is qualified to manage the compensation lands in perpetuity.

   If CDFG takes fee title to the compensation lands, CDFG shall determine whether it will hold the long-term management fee in the special deposit fund, leave the money in the REAT Account, or designate another entity to manage the long-term maintenance and management fee for CDFG and with CDFG supervision. The Project owner shall ensure that an agreement is in place with the long-term maintenance and management fee holder/manager to ensure the following conditions:

   i. Interest. Interest generated from the initial capital shall be available for reinvestment into the principal and for the longterm operation, management, and protection of the approved compensation lands, including reasonable administrative overhead, biological monitoring, improvements to carrying capacity, law enforcement measures, and any other action approved by CDFG

designed to protect or improve the habitat values of the compensation lands.

ii. Withdrawal of Principal. The long-term maintenance and management fee principal shall not be drawn upon unless such withdrawal is deemed necessary by the CPM, in consultation with CDFG, or the approved third-party long-term maintenance and management fee manager to ensure the continued viability of the species on the compensation lands. If CDFG takes fee title to the compensation lands, monies received by CDFG pursuant to this provision shall be deposited in a special deposit fund established solely for the purpose to manage lands in perpetuity unless CDFG designates NFWF or another entity to manage the longterm maintenance and management fee for CDFG.

iii. Pooling Funds. A CPM- approved non-profit organization qualified to hold long-term maintenance and management fees solely for the purpose to manage lands in perpetuity, may pool the fund with other funds for the operation, management, and protection of the compensation lands for local populations of desert tortoise. However, for reporting purposes, the long-term maintenance and management fee fund must be tracked and reported individually to the CDFG and CPM.

iv. Reimbursement Fund. The project owner shall provide reimbursement to CDFG or an approved third party for reasonable expenses incurred during title, easement, and documentation review; expenses incurred from other State or State-approved federal agency reviews; and overhead related to providing compensation lands.

COMPENSATORY MITIGATION LAND SECURITY

1. Compensation Mitigation Security: The project owner shall provide security sufficient for funding acquisition, improvement, and longterm management of desert tortoise compensation land. Financial assurance can be provided to the CPM in the form of an irrevocable letter of credit, a pledged savings account or another form of security ("Security"). Prior to submitting the Security to the CPM, the Project owner shall obtain the CPM's approval, in consultation with CDFG, BLM and the USFWS, of the form of the Security.

The security amount shall be based on the estimates provided in **Biological Resources Addendum Tables 5** and **7.** This amount shall be updated and verified prior to payment and shall be adjusted to reflect actual costs or more current estimates as agreed upon by the REAT agencies.

The Project owner shall provide verification that financial assurances have been established to the CPM with copies of the document(s) to BLM, CDFG and the USFWS, to guarantee that an adequate level of funding is available to implement any of the mitigation measures required by this condition that are not completed prior to the start of ground-disturbing activities described in Section A of this condition.

In the event that the project owner defaults on the Security, the CPM may use money from the Security solely for implementation of the requirements of this condition.

The CPM's use of the security to implement measures in this condition may not fully satisfy the Project owner's obligations under this condition. Any amount of the Security that is not used to carry out mitigation shall be returned to the Project owner upon successful completion of the associated requirements in this condition.

Security for the requirements of this condition shall be provided in the amount of $31,079,934 (or $31,755,574.02 if the project owner elects to use the REAT Account with NFWF pursuant to paragraph 4 of this condition, below). The Security is calculated in part from the items that follow but adjusted as specified below (consult **Biological Resources Addendum Tables 5** and **7** for the complete breakdown of estimated costs). However, regardless of the amount of the security or actual cost of implementation, the project owner shall be responsible for implementing all aspects of this condition.

i. land acquisition costs for compensation land, calculated at $1,000/acre;

ii. Site assessments, appraisals, biological surveys, transaction closing and escrow costs, calculated as $18,000 total per parcel (presuming 320 acres per parcel)

iii. Initial site clean-up, restoration, or enhancement, calculated at $250/acre;

iv. Third-party and agency administrative transaction costs and overhead, calculated as percentages of land cost;

v. Long-term management and maintenance fund, calculated at $1 ,450 per acre;

vi. NFWF fees to establish a project-specific account; manage the sub-account for acquisition and initial site work; and manage the sub-account for long term management and maintenance.

2. Phasing of Security Payment: Compensatory Mitigation Land Security may be phased according to phasing of the project's approval and construction. Phasing of compensation funding shall be based upon land disturbance and habit impacts for each project phase. Phasing of the mitigation payment is described further in staff's recommended Condition of Certification **BIO-31** (most recent revision, below).

3. The project owner may elect to comply with some or all of the requirements in this condition by providing funds to implement the requirements into the Renewable Energy Action Team (REAT) Account established with the National Fish and Wildlife Foundation (NFWF). To use this option, the Project owner must make an initial deposit to the REAT Account in an amount equal to the estimated costs of implementing the requirement (as set forth in the Security section of this condition, paragraph 3, above). If the actual cost of the acquisition, initial protection and habitat improvements, longterm funding or other cost is more than the estimated amount initially paid by the project owner, the project owner shall make

an additional deposit into the REAT Account sufficient to cover the actual acquisition costs, the actual costs of initial protection and habitat improvement on the compensation lands, the long-term funding requirements as established in an approved PAR or PAR-like analysis, or the other actual costs that are estimated in the table. If those actual costs or PAR projections are less than the amount initially transferred by the project owner, the remaining balance shall be returned to the project owner.

4. The responsibility for acquisition of compensation lands may be delegated to a third party other than NFWF, such as a nongovernmental organization supportive of desert habitat conservation, by written agreement of the Energy Commission. Such delegation shall be subject to approval by the CPM, in consultation with CDFG, BLM and USFWS, prior to land acquisition, enhancement or management activities. Agreements to delegate land acquisition to an approved third party, or to manage compensation lands shall be executed and implemented within 18 months after start of Pre-Construction Site Mobilization.
5. The project owner may request the CPM to provide it with all available information about any funds held by the Energy Commission, CDFG, or NFWF as project security, or funds held in a NFWF sub-account for this project, or other project-specific account held by a third party. The CPM shall also fully cooperate with any independent audit that the project owner may choose to perform on any of these funds.

Verification: The project owner shall provide the CPM with written notice of intent to start ground disturbance at least 30 days prior to Pre-Construction Site Mobilization.

If the mitigation actions required under this condition are not completed at least 30 days prior to any phase of Pre-Construction Site Mobilization, the Project owner shall provide verification to the CPM and CDFG that an approved Security for such phase has been established in accordance with this condition of certification no later than 30 days prior Pre-Construction Site Mobilization of the phase. Financial assurance can be provided to the CPM in the form of an irrevocable letter of credit, a pledged savings account or another form of security ("Security"). Prior to submitting the Security to the CPM, the project owner shall obtain the CPM's approval, in consultation with CDFG, BLM and the USFWS, of the form of the Security. The project owner, or an approved third party, shall complete and provide written verification to the CPM, CDFG, BLM and USFWS of the compensation lands acquisition and transfer within 18 months of the start of Pre-Construction Site Mobilization.

No later than 12 months after the start of any phase of Pre-Construction Site Mobilization, the project owner shall submit a formal acquisition proposal to the CPM describing the parcels intended for purchase, and shall obtain approval from the CPM, in consultation with CDFG, BLM and USFWS, prior to the acquisition. If NFWF or another approved third party is handling the acquisition, the project owner shall fully cooperate with the third party to ensure the proposal is submitted within this time period. The project owner or an approved third party shall complete the acquisition and all required transfers of the compensation lands, and provide written verification

to the CPM, CDFG, BLM and USFWS of such completion, no later than 18 months after the start of Pre-Construction Site Mobilization. If NFWF or another approved third party is being used for all or part of the acquisition, the project owner shall ensure that funds needed to accomplish the acquisition are transferred in timely manner to facilitate the planned acquisition and to ensure the land can be acquired and transferred prior to the 18-month deadline.

The project owner shall complete and submit to the CPM a PAR or PAR-like analysis no later than 60 days after the CPM approves compensation lands for acquisition associated with any phase of construction. The project owner shall fully fund the required amount for long-term maintenance and management of the compensation lands for that phase of construction no later than 30 days after the CPM approves a PAR or PAR-like analysis of the anticipated long-term maintenance and management costs of the compensation lands. Written verification shall be provided to the CPM and CDFG to confirm payment of the long-term maintenance and management funds.

No later than 60 days after the CPM determines what activities are required to provide for initial protection and habitat improvement on the compensation lands for any phase of construction, the project owner shall make funding available for those activities and provide written verification to the CPM of what funds are available and how costs will be paid. Initial protection and habitat improvement activities on the compensation lands for that phase of construction shall be completed, and written verification provided to the CPM, no later than six months after the CPM's determination of what activities are required on the compensation lands.

The project owner, or an approved third party, shall provide the CPM, CDFG, BLM and USFWS with a management plan for the compensation lands associated with any phase of construction within180 days of the land or easement purchase, as determined by the date on the title. The CPM, in consultation with CDFG, BLM and the USFWS, shall approve the management plan after its content is acceptable to the CPM.

Within 90 days after completion of project construction, the project owner shall provide to the CPM, CDFG, BLM and USFWS an analysis, based on aerial photography, with the final accounting of the amount of habitat disturbed during Project construction. If this analysis shows that more lands were disturbed than was anticipated in this condition, the project owner shall provide the Energy Commission with additional compensation lands and funding commensurate with the added impacts and applicable mitigation ratios set forth in this condition. A final analysis of all project related ground disturbance may not result in a reduction of compensation requirements if the deadlines established under this condition for transfer of compensation lands and funding have passed prior to completion of the analysis.

RAVEN MONITORING, MANAGEMENT, AND CONTROL PLAN

BIO-18 The project owner shall design and implement a Raven Monitoring, Management, and Control Plan (Raven Plan) that is consistent with the most current USFWS-approved raven management guidelines and that meets the

approval of the USFWS, CDFG, and the CPM. Any subsequent modifications to the approved Raven Plan shall be made only with approval of the CPM in consultation with USFWS and CDFG. The Raven Plan shall include but not be limited to a program to monitor increased raven presence in the Project vicinity and to implement raven control measures as needed based on that monitoring. The purpose of the plan is to avoid any Project-related increases in raven numbers during construction, operation, and decommissioning. The threshold for implementation of raven control measures shall be any increases in raven numbers from baseline conditions, as detected by monitoring to be proposed in the Raven Plan. Regardless of raven monitoring results, the project owner shall be responsible for all other aspects of the Raven Plan, including avoidance and minimization of project-related trash, water sources, or perch/roost sites that could contribute to increased raven numbers. In addition, to offset the cumulative contributions of the Project to desert tortoise from increased raven numbers, the Project owner shall also contribute to the USFWS Regional Raven Management Program. The Project owner shall do all of the following:

1. Prepare and Implement a Raven Management Plan that includes the following:
   a. Identify conditions associated with the Project that might provide raven subsidies or attractants;
   b. Describe management practices to avoid or minimize conditions that might increase raven numbers and predatory activities;
   c. Describe control practices for ravens;
   d. Address monitoring and nest removal during construction and for the life of the Project, and;
   e. Discuss reporting requirements.
2. Contribute to the USFWS Regional Raven Management Program. The project owner shall submit payment to the project sub-account of the REAT Account held by the National Fish and Wildlife Foundation (NFWF) to support the USFWS Regional Raven Management Program. The amount shall be a one-time payment of $105 per acre of permanent disturbance (totaling $484,470). Payment may be made in phases corresponding to proposed phasing of the project described in Condition of Certification **BIO-31.**

Verification: No later than 30 days prior to Pre-Construction Site Mobilization, the project owner shall provide written verification to the CPM that NFWF has received and accepted payment into the project's sub-account of the REAT Account to support the USFWS Regional Raven Management Program.

No later than 30 days prior to Pre-Construction Site Mobilization, the Project owner shall provide the CPM, USFWS, and CDFG with the final version of a Raven Plan. All modifications to the approved Raven Plan shall be made only with approval of the CPM

in consultation with USFWS and CDFG.

Within 30 days after completion of Project construction, the Project owner shall provide to the CPM for review and approval, a written report identifying which items of the Raven Plan have been completed, a summary of all modifications to mitigation measures made during the Project's construction phase, and which items are still outstanding.

On January 31st of each year following construction the Designated Biologist shall provide a report to the CPM that includes: a summary of the results of raven management and control activities for the year; a discussion of whether raven control and management goals for the year were met; and recommendations for raven management activities for the upcoming year.

PRE-CONSTRUCTION NEST SURVEYS AND IMPACT AVOIDANCE MEASURES FOR MIGRATORY BIRDS

BIO-19 Pre-construction nest surveys shall be conducted each year during the construction phase of the project if construction activities will occur during the breeding period (from January 1 through August 1). The Designated Biologist or Biological Monitor conducting the surveys shall be experienced bird surveyors who have demonstrated experience conducting nest searches; are knowledgeable of the nesting habitats of species that may nest on the site; and are familiar with standard nest-locating techniques such as those described in Martin and Guepel (1993). Surveys shall be conducted in accordance with the following guidelines. Nothing in this condition requires the project owner to conduct burrowing owl surveys by entering private lands adjacent to the project site when the project owner has made reasonable attempts to obtain permission to enter the property for survey work but was unable to obtain such permission. In this situation only, the project owner may substitute binocular surveys for protocol field surveys.

1. Surveys shall cover all potential nesting habitat in the project site and within 500 feet of the boundaries of the plant site and linear facilities;

    3. At least two pre-construction 100-percent coverage surveys shall be conducted of each proposed construction area, separated by a minimum 10-day interval. One of the surveys shall be conducted within the 10 days preceding initiation of construction activity. Additional follow-up surveys may be required if periods of construction inactivity exceed one week in any given area, an interval during which birds may establish a nesting territory and initiate egg laying and incubation; If active nests are detected during the survey, a 500 foot no-disturbance buffer zone shall be implemented and a monitoring plan shall be developed. This protected area surrounding the nest may be adjusted by the Designated Biologist in consultation with CDFG, BLM, USFWS, and CPM. Nest locations shall be mapped using GPS technology and the

location data provided in completion reports (below) to the CPM and BLM Wildlife Biologist; and

4. The Designated Biologist shall monitor the nest until he or she determines that nestlings have fledged and dispersed. Monitoring shall avoid disturbing the nests or causing an increased risk of predation. Activities that might, in the opinion of the Designated Biologist and in consultation with the CPM and BLM, disturb nesting activities shall be prohibited within the buffer zone until such a determination is made.

Verification: Upon completion of the surveys, and prior to initiating any vegetation removal or ground-disturbing activities (i.e., no more than 10 days prior to the start of such activities), the project owner shall provide the CPM and BLM a letter-report describing the methods and findings of the pre-construction nest surveys, including the time, date, and duration of the survey; identity and qualifications of the surveyor(s); and a list of species observed. If active nests are detected during the survey, the report shall include a map or aerial photo identifying the location of the nest and shall depict the boundaries of the no-disturbance buffer zone around the nest.

PRE-CONSTRUCTION SURVEYS FOR GOLDEN EAGLES

BIO-20 The Project owner shall implement the following measures to avoid or minimize Project-related construction impacts to golden eagles.

1. Annual Inventory During Construction. For each calendar year during which construction will occur an inventory shall be conducted to determine if golden eagle territories occur within one mile of the Project boundaries. Survey methods and surveyor qualifications for the inventory shall be as described in the Interim Golden Eagle Inventory and Monitoring Protocols; and Other Recommendations (Pagel et al. 2010) or more current guidance from the USFWS.

2. Inventory Data: Data collected during the inventory shall include at least the following: territory status (unknown, vacant, occupied, breeding successful, breeding unsuccessful); nest location, nest elevation; age class of golden eagles observed; nesting chronology; number of young at each visit; digital photographs; and substrate upon which nest is placed.

3. Determination of Unoccupied Territory Status: A nesting territory or inventoried habitat shall be considered unoccupied by golden eagles only after completing at least two full surveys in a single breeding season.

4. Monitoring and Adaptive Management Plan: If an occupied nest[2] is detected within one mile of the Project boundaries, the Project owner shall prepare and implement a Golden Eagle Monitoring and Management Plan for the duration of construction to ensure that Project construction activities do not result in injury or disturbance to golden eagles. The monitoring methods shall be consistent with those described in the Interim Golden Eagle Inventory and Monitoring Protocols; and Other

Recommendations (Pagel et al. 2010) or more current guidance from the USFWS. The Monitoring and Management Plan shall be prepared in consultation with the USFWS. Triggers for adaptive management shall include any evidence of Project-related disturbance to nesting golden eagles, including but not limited to: agitation behavior (displacement, avoidance, and defense); increased vigilance behavior at nest sites; changes in foraging and feeding behavior, or nest site abandonment. The monitoring and Management Plan shall include a description of adaptive management actions, which shall include, but not be limited to, cessation of construction activities that are deemed by the Designated Biologist to be the source of golden eagle disturbance.

Verification: No later than 30 days after completion of the golden eagle inventory the project owner shall submit a report to the CPM, CDFG, and USFWS documenting the results of the inventory.

If an occupied nest is detected within one mile of the Project boundary during the inventory, the Project owner shall contact staff at the USFWS Ventura Office and CDFG within one working day of detection of the nest for interim guidance on monitoring and nest protection. The project owner shall provide the CPM, CDFG, and USFWS with the final version of the Golden Eagle Monitoring and Management Plan within 30 days after detection of the nest. This final Plan shall have been reviewed and approved by the CPM in consultation with USFWS and CDFG.

BURROWING OWL IMPACT AVOIDANCE AND MINIMIZATION MEASURES

BIO-21 The Project owner shall implement the following measures to avoid, minimize and offset impacts to burrowing owls. Nothing in this condition requires the project owner to conduct burrowing owl surveys by entering private lands adjacent to the project site when the project owner has made reasonable attempts to obtain permission to enter the property for survey work but was unable to obtain such permission. In this situation only, the project owner may substitute binocular surveys for protocol field surveys.

Pre-Construction Surveys. The Designated Biologist or Biological Monitor shall conduct pre-construction surveys for burrowing owls. Surveys shall be focused exclusively on detecting burrowing owls, and shall be conducted from two hours before sunset to one hour after or from one hour before to two hours after sunrise. The survey area shall include the Project Disturbance Area and surrounding 500-foot survey buffer.

Implement Avoidance Measures. If an active burrowing owl burrow is detected within 500 feet from the Project Disturbance Area the following avoidance and minimization measures shall be implemented:

Establish Non-Disturbance Buffer. Fencing shall be installed at a 250-foot radius from the occupied burrow to create a non-disturbance buffer around the burrow.

The non-disturbance buffer and fence line may be reduced to 160 feet if all Project-related activities that might disturb burrowing owls would be conducted during the non-breeding season (September 1st through January 31st) . Signs shall be posted in English and Spanish at the fence line indicating no entry or disturbance is permitted within the fenced buffer.

Monitoring: If construction activities would occur within 500 feet of the occupied burrow during the nesting season (February 1 – August 31st) the Designated Biologist or Biological Monitor shall monitor to determine if these activities have potential to adversely affect nesting efforts, and shall implement measures to minimize or avoid such disturbance.

3. Passive Relocation of Burrowing Owls. If pre-construction surveys indicate the presence of burrowing owls within the Project Disturbance Area (the Project Disturbance Area means all lands disturbed in the construction and operation of the Calico Project), the Project owner shall prepare and implement a Burrowing Owl Relocation and Mitigation Plan, in addition to the avoidance measures described above. The final Burrowing Owl Relocation and Mitigation Plan shall be approved by the CPM, in consultation with USFWS, BLM and CDFG, and shall:

a. Identify and describe suitable relocation sites within 1 mile of the Project Disturbance Area, and describe measures to ensure that burrow installation or improvements would not affect sensitive species habitat or existing burrowing owl colonies in the relocation area;

Provide guidelines for creation or enhancement of at least two natural or artificial burrows per relocated owl, including a discussion of timing of burrow improvements, specific location of burrow installation, and burrow design. Design of the artificial burrows shall be consistent with CDFG guidelines (CDFG 1995) and shall be approved by the CPM in consultation with CDFG, BLM and USFWS;

Passive relocation sites shall be in areas of suitable habitat for burrowing owl nesting, and be characterized by minimal human disturbance and access. Relative cover of non-native plants within the proposed relocation sites shall not exceed the relative cover of non-native plants in the adjacent habitats;

d. Provide detailed methods and guidance for passive relocation of burrowing owls occurring within the Project Disturbance Area; and

4. Acquire Compensatory Mitigation Lands for Burrowing Owls. The following measures for compensatory mitigation shall apply only if burrowing owls are detected within the Project Disturbance Area. The Project owner shall acquire, in fee or in easement, 19.5 acres of land for each burrowing owl that is displaced by construction of the Project. This compensation acreage of 19.5 acres per single bird or pair of nesting owls assumes that there is no evidence that the compensation lands are occupied by burrowing owls. If burrowing owls are

observed to occupy the compensation lands, then only 9.75 acres per single bird or pair is required, per CDFG (1995) guidelines. If the compensation lands are contiguous to currently occupied habitat, then the replacement ratio will be 13.0 acres per pair or single bird. The Project owner shall provide funding for the enhancement and long-term management of these compensation lands. The acquisition and management of the compensation lands may be delegated by written agreement to CDFG or to a third party, such as a nongovernmental organization dedicated to habitat conservation, subject to approval by the CPM, in consultation with CDFG and USFWS prior to land acquisition or management activities. Additional funds shall be based on the adjusted market value of compensation lands at the time of construction to acquire and manage habitat. In lieu of acquiring lands itself, the Project owner may satisfy the requirements of this condition by depositing funds into the Renewable Energy Action Team (REAT) Account established with the National Fish and Wildlife Foundation (NFWF), as described in Section 3.i. of Condition of Certification **BIO-17.**

Criteria for Burrowing Owl Mitigation Lands. The terms and conditions of this acquisition or easement shall be as described in Paragraph 1 of **BIO-17** [Desert Tortoise Compensatory Mitigation], with the additional criteria to include: 1) the mitigation land must provide suitable habitat for burrowing owls, and 2) the acquisition lands must either currently support burrowing owls or be within dispersal distance from an active burrowing owl nesting territory (generally approximately 5 miles). The burrowing owl mitigation lands may be included with the desert tortoise mitigation lands ONLY if these two burrowing owl criteria are met. If the burrowing owl mitigation land is separate from the acquisition required for desert tortoise compensation lands, the Project owner shall fulfill the requirements described below in this condition.

Security. If burrowing owl mitigation land is separate from the acreage required for desert tortoise compensation lands the Project owner or an approved third party shall complete acquisition of the proposed compensation lands prior to initiating ground-disturbing Project activities. Alternatively, financial assurance can be provided by the Project owner to the CPM with copies of the document(s) to CDFG, BLM and the USFWS, to guarantee that an adequate level of funding is available to implement the mitigation measure described in this condition. These funds shall be used solely for implementation of the measures associated with the Project. Financial assurance can be provided to the CPM in the form of an irrevocable letter of credit, a pledged savings account or another form of security ("Security") prior to initiating ground-disturbing Project activities. Prior to submittal to the CPM, the Security shall be approved by the CPM, in consultation with CDFG, BLM and the USFWS to ensure funding. The estimated costs of enhancement and endowment are discussed in condition **BIO-17.** The final amount due will be determined by the PAR analysis conducted pursuant to **BIO-17.**

Verification: If pre-construction surveys detect burrowing owls within 500 feet of proposed construction activities, the Designated Biologist shall provide to the CPM, BLM, CDFG and USFWS documentation indicating that non-disturbance buffer

fencing has been installed at least 10 days prior to the start of Pre-Construction Site Mobilization. The Project owner shall report monthly to the CPM, CDFG, BLM and USFWS for the duration of construction on the implementation of burrowing owl avoidance and minimization measures. Within 30 days after completion of construction the Project owner shall provide to the CPM, BLM, CDFG and USFWS a written construction termination report identifying how mitigation measures described in the plan have been completed.

If pre-construction surveys detect burrowing owls within the Project Disturbance Area, the Project owner shall notify the CPM, BLM, CDFG and USFWS no less than 10 days of completing the surveys that a relocation of owls is necessary. The Project owner shall do all of the following if relocation of one or more burrowing owls is required:

Within 30 days of completion of the burrowing owl pre-construction surveys, submit to the CPM, CDFG and USFWS a Burrowing Owl Relocation and Mitigation Plan.

No less than 90 days prior to acquisition of the burrowing owl compensation lands, the Project owner, or an approved third party, shall submit a formal acquisition proposal to the CPM, CDFG, and USFWS describing the 39-acre parcel intended for purchase. At the same time the Project owner shall submit a PAR or PAR-like analysis for the parcels for review and approval by the CPM, CDFG and USFWS.

Within 90 days of the land or easement purchase, as determined by the date on the title, the Project owner shall provide the CPM with a management plan for review and approval, in consultation with CDFG, BLM and USFWS, for the compensation lands and associated funds.

No later than 30 days prior to the start of any phase of Pre-Construction Site Mobilization, the Project owner shall provide written verification of Security for such phase in accordance with this condition of certification.

No later than 18 months after Pre-Construction Site Mobilization, the Project owner shall provide written verification to the CPM, BLM, CDFG and USFWS that the compensation lands or conservation easements have been acquired and recorded in favor of the approved recipient.

On January 31st of each year following construction for a period of five years, the Designated Biologist shall provide a report to the CPM, USFWS, BLM and CDFG that describes the results of monitoring and management of the burrowing owl relocation area. The annual report shall provide an assessment of the status of the relocation area with respect to burrow function and weed infestation, and shall include recommendations for actions the following year for maintaining the burrows as functional burrowing owl nesting sites and minimizing the occurrence of weeds.

AVIAN PROTECTION PLAN / MONITORING BIRD IMPACTS FROM SOLAR TECHNOLOGY

BIO-22 The project owner shall prepare and implement an Avian and Bat Protection Plan to monitor bird and bat collisions with facility features (study described below). The Project owner shall use the monitoring data to inform and develop an adaptive management program that would avoid and minimize Project-related avian and bat impacts. Project-related bird and bat deaths or injuries shall be reported to the CPM, CDFG and USFWS. The CPM, in consultation with CDFG and USFWS, shall determine if the Project-related bird or bat deaths or injuries warrant implementation of adaptive management measures contained in the Avian and Bat Protection Plan. The study design for the Avian and Bat Protection Plan shall be approved by the CPM in consultation with CDFG and USFWS, and, once approved, shall be incorporated into the project's BRMIMP and implemented. The Plan shall include adaptive management strategies that include the placement of bird flight diverters, aerial markers, or other strategies to minimize collisions with the SunCatcher units.

The Avian and Bat Protection Plan shall include a Bird Monitoring Study to monitor the death and injury of birds and bats from collisions with facility features such as reflective mirror-like surfaces and from heat, and bright light from concentrating sunlight. The study design shall be approved by BLM's Wildlife Biologist and the CPM in consultation with CDFG and USFWS, and shall be incorporated into the project's BRMIMP and implemented. The Bird Monitoring Study shall be based upon prior studies by McCrary et al. (1986) or other applicable literature including the Region 8 Interim Guidelines for the Development of a Project-Specific Avian and Bat Protection Plan for Solar Energy Plants and Related Transmission Facilities (USFWS 2010), and shall include detailed specifications on data and carcass collection protocol and a rationale justifying the proposed schedule of carcass searches. The study shall also include seasonal trials to assess bias from carcass removal by scavengers as well as searcher bias and proposed disposition of dead or injured birds.

Verification: At least 30 days prior to Pre-Construction Site Mobilization, the project owner shall submit to the CPM, BLM's Wildlife Biologist, USFWS and CDFG a final Avian Protection Plan. Modifications to the Avian Protection Plan shall be made only after approval from BLM's Wildlife Biologist and the CPM.

For one year following the beginning of SunCatcher operation, the Designated Biologist shall submit quarterly reports to BLM's Wildlife Biologist, CPM, CDFG, and USFWS describing the methods, dates, durations, and results of monitoring. The quarterly reports shall provide a detailed description of any project-related bird or wildlife deaths or injuries detected during the monitoring study or at any other time. Following the completion of the fourth quarter of monitoring the Designated Biologist shall prepare an Annual Report that summarizes the year's data, analyzes any project-related bird fatalities or injuries detected, and provides recommendations for future monitoring and any adaptive management actions needed. The Annual Report shall be provided to

the CPM, BLM's Wildlife Biologist, CDFG, and USFWS. Quarterly reporting shall continue until BLM's Wildlife Biologist and the CPM, in consultation with CDFG and USFWS determine whether more years of monitoring are needed, and whether mitigation and adaptive management measures are necessary. After the Bird Monitoring Study is determined by BLM's Wildlife Biologist and the CPM to be complete, the project owner or contractor shall prepare a paper that describes the study design and monitoring results to be submitted to the CPM, BLM's Wildlife Biologist, CDFG, USFWS, and a peer-reviewed scientific journal. Proof of submittal shall be provided to BLM's Wildlife Biologist and the CPM within one year of concluding the monitoring study.

NELSON'S BIGHORN SHEEP MITIGATION

BIO-23 The Designated Biologist or Biological Monitor shall be responsible for daily binocular scans of the project area and surrounding hills and bajadas to search for Nelson's bighorn sheep. At any time bighorn sheep are seen within 2,000 feet of any active construction site, the Designated Biologist or Biological Monitor shall monitor their activity until the animals leave the area. If the bighorn sheep approach within 500 feet of any active construction site, then construction shall cease until the animals have moved farther than 500 feet away from construction activities, even if construction is occurring within an area that had been fenced with tortoise exclusion fencing. This buffer may be modified with the approval of the CPM, and BLM, in consultation with CDFG. In addition, the project owner shall provide resource agency staff and private conservation foundation staff and volunteers permanent access to the Cady Mountains via Hector Road or another suitable route for any activities related to Nelson's bighorn sheep monitoring or management.

Verification: Impact minimization measures and implementation methods for Nelson's bighorn sheep and their implementation methods shall be included in the final BRMIMP and implemented during construction and operation of the project. Implementation of the measures shall be reported in the Monthly Compliance Reports by the Designated Biologist.

AMERICAN BADGER AND DESERT KIT FOX IMPACT AVOIDANCE AND MINIMIZATION MEASURES

BIO-24 Prior to ground disturbance the project owner shall conduct pre-construction surveys for American badgers and desert kit fox. These surveys may be conducted concurrent with the desert tortoise surveys. Surveys shall be conducted as described below:

Biological Monitors shall perform pre-construction surveys for badger and kit fox dens in the project area, including areas within 90 feet of all project facilities, utility corridors, and access roads. If dens are detected, each den shall be classified as inactive, potentially active, or definitely active.

Inactive dens that would be directly impacted by construction activities shall be excavated by hand and backfilled to prevent reuse by badgers or kit fox. Potentially active dens that would be directly impacted by construction activities shall be monitored by the Biological Monitor for three consecutive nights using a tracking medium (such as diatomaceous earth or fire clay) and/or infrared camera stations at the entrance. If no tracks are observed in the tracking medium or no photos of the target species are captured after three nights, the den shall be excavated and backfilled by hand.

Occupied badger dens shall be flagged and ground-disturbing activities avoided within 50 feet of the occupied den. Maternity dens shall be avoided during the pup-rearing season (15 February through 1 July) and a minimum 200-foot disturbance-free buffer established. Buffers may be modified with the concurrence of CDFG and CPM. Maternity dens shall be flagged for avoidance, identified on construction maps, and a biological monitor shall be present during construction.

If avoidance of a non-maternity den is not feasible, badgers shall be relocated or allowed to escape the project area (e.g., by providing a temporary monitored opening in the tortoise exclusion fence and directing the animal toward the opening with temporary plastic construction fencing). If necessary, dens will be slowly excavated (either by hand or mechanized equipment under the direct supervision of the biologist, removing no more that 4 inches at a time) before or after the rearing season (15 February through 1 July). Any relocation of badgers shall occur only after consultation with the CDFG and CPM. A written report documenting the badger removal shall be provided to the CPM within 30 days of relocation. In the event that passive relocation techniques fail for badgers, the Project owner will contact CDFG to explore other relocation options, which may include trapping.

Verification: The project owner shall submit a report to the CPM, BLM, and CDFG within 30 days of completion of badger and kit fox surveys. The report shall describe survey methods, results, mitigation measures implemented, and the results of the mitigation.

BAT IMPACT AVOIDANCE AND MINIMIZATION MEASURES

BIO-25 The project owner shall conduct a survey for roosting bats prior to any ground disturbance activities in all areas within 200 feet of rocky outcrops or the existing BNSF railroad trestles. The project owner shall also conduct surveys for roosting bats during the maternity season (1 March to 31 July) within 300 feet of project activities at the existing railroad trestles and rocky outcrops. These areas shall be surveyed by a qualified bat biologist, who shall be approved by the Designated Biologist. Surveys shall include a minimum of one day and one evening visit. If active maternity roosts or hibernacula are found, the rock outcrop or trestle occupied by the roost shall be avoided (i.e., not removed) by the project, if feasible. If avoidance of the maternity

roost is not feasible, the bat biologist shall survey (through the use of radio telemetry or other CDFG/CPM/BLM-approved methods) for nearby alternative maternity colony sites. If the bat biologist determines in consultation with and with the approval of the CDFG, BLM's Wildlife Biologist, and CPM that there are alternative roost sites used by the maternity colony and young are not present, then no further action is required. However, if there are no alternative roost sites used by the maternity colony, provision of substitute roosting bat habitat is required. If active maternity roosts are absent, but a hibernaculum (i.e., a non-maternity roost) is present, then exclusion of bats prior to demolition of roosts is required.

1. Provision of substitute roosting bat habitat. If a maternity roost will be impacted by the project, and no alternative maternity roosts are in use within 1 mile of the site, substitute roosting habitat for the maternity colony shall be provided on, or in close proximity to, the project site no less than three months prior to the eviction of the colony. Alternative roost sites will be constructed in accordance with the specific bats' requirements in coordination with CDFG, BLM's Wildlife Biologist, and the CPM. Alternative roost sites must be of comparable size and proximal in location to the impacted colony. The CDFG shall also be notified of any hibernacula or active nurseries within the construction zone.

2. Exclude bats prior to demolition of roosts. If non-breeding bat hibernacula are found in rocky outcrops scheduled to be removed or in crevices in rock outcrops within the grading footprint, the individuals shall be safely evicted, according to timing and under the direction of the qualified bat biologist, by opening the roosting area to allow airflow through the cavity or other means determined appropriate by the bat biologist (e.g., installation of one-way doors). In situations requiring one-way doors, a minimum of one week shall pass after doors are installed and temperatures should be sufficiently warm for bats to exit the roost. This action should allow all bats to leave during the course of one week. Roosts that need to be removed in situations where the use of one-way doors is not necessary in the judgment of the qualified bat biologist shall first be disturbed by various means at the direction of the bat biologist at dusk to allow bats to escape during the darker hours, and the roost tree shall be removed or the grading shall occur the next day (i.e., there shall be no less or more than one night between initial disturbance and the grading or tree removal).

   If an active maternity roost is located in an area to be impacted by the project, and alternative roosting habitat is available, the demolition of the roost site must commence before maternity colonies form (i.e., prior to 1 March) or after young are flying (i.e., after 31 July) using the exclusion techniques described above.

Verification: The project owner shall submit a report to the CPM, the BLM Wildlife Biologist, and the CDFG within 30 days of completion of roosting bat surveys and any

subsequent mitigation. The report shall describe survey methods, results, mitigation measures implemented, and the results of the mitigation.

STREAMBED IMPACT MINIMIZATION AND COMPENSATION MEASURES

BIO-26 The project owner shall implement the following measures to avoid, minimize and mitigate for direct and indirect impacts to jurisdictional waters of the State and to satisfy requirements of California Fish and Game Code sections 1600 and 1607. Throughout this condition, "jurisdictional" refers to streambeds or acreages of streambed meeting CDFG criteria as waters of the State.

Section A: Acquire Off-Site State Waters.

The project owner shall acquire, in fee or in easement, a parcel or parcels of land as state-jurisdictional streambed compensation acreage calculated at a ratio of 1:1 for waters of the State. The applicant shall map the vegetation with emphasis on desert wash, including microphyll woodland, communities within the drainages subject to project disturbance and provide a map to the CPM, CDFG and BLM. The parcel or parcels comprising the state-jurisdictional streambed compensation acreage calculated at a 1:1 ratio shall include the same types of vegetation as mapped in the project footprint.

This compensation acreage may be included ("nested") within the acreage acquired and managed as desert tortoise habitat compensation (Condition of Certification **BIO-17)** only if:

- Adequate acreage of qualifying state-jurisdictional streambed delineated within the desert tortoise compensation lands;
- The desert tortoise habitat compensation lands are acquired and dedicated as permanent conservation lands within 18 months from the start of Pre-Construction Site Mobilization.

If these two criteria are not met, then the project owner shall provide no fewer than state-jurisdictional streambed compensation acreage calculated at the 1:1 ratio independent of any compensation land required under other conditions of certification (adjusted to reflect the final project footprint and expert's delineation of streambed on the compensation lands), and shall also provide funding for the initial improvement and long-term maintenance and management of the acquired lands, and to comply with other related requirements this condition. Costs of these requirements cannot be estimated in advance because jurisdictional streambed would make up only a small portion of any acquired parcel and might vary widely among available parcels. In general, however the total costs shall be based upon land acquisition and management costs as discussed in Condition of Certification **BIO-17** and shall include all associated costs as described in that Condition. This amount may be revised by the CPM in consultation with DFG, BLM and USFWS, based on further analysis of long-term management and maintenance costs. See **Biological Resources Addendum Tables 5** and **9.** The terms and conditions of this acquisition or easement

shall be as described in Condition of Certification **BIO-17.** Mitigation for impacts to State waters shall occur within the surrounding watersheds, as close to the project site as possible.

The project owner may elect to comply with the requirements in this condition for acquisition of compensation lands, initial protection and habitat improvement on the compensation lands, or long-term maintenance and management of the compensation lands by funding, or any combination of these three requirements, by providing funds to implement those measures into the Renewable Energy Action Team (REAT) Account established with the National Fish and Wildlife Foundation (NFWF). To use this option, the Project owner must make an initial deposit to the REAT Account in an amount equal to the estimated costs of implementing the requirement. If the actual cost of the acquisition, initial protection and habitat improvements, or longterm funding is more than the estimated amount initially paid by the project owner, the project owner shall make an additional deposit into the REAT Account sufficient to cover the actual acquisition costs, the actual costs of initial protection and habitat improvement on the compensation lands, or the long-term funding requirements as established in an approved PAR or PAR-like analysis. If those actual costs or PAR projections are less than the amount initially transferred by the project owner, the remaining balance shall be returned to the project owner.

The responsibility for acquisition of compensation lands may be delegated to a third party other than NFWF, such as a nongovernmental organization supportive of desert habitat conservation, by written agreement of the Energy Commission. Such delegation shall be subject to approval by the CPM, in consultation with CDFG, BLM and USFWS, prior to land acquisition, enhancement or management activities. Agreements to delegate land acquisition to an approved third party, or to manage compensation lands, shall be executed and implemented within 18 months of the Energy Commission's certification of the project.

Management Plan for Acquired Lands: The project owner shall prepare and submit to Energy Commission CPM and CDFG a draft Management Plan that reflects site-specific enhancement measures for the drainages on the acquired compensation lands. The objective of the Management Plan shall be to enhance the wildlife value of the drainages, and may include enhancement actions such as weed control, fencing to exclude livestock, or erosion control. Where applicable, the management plan should be integrated with desert tortoise compensation land habitat management planning requirements as described in **BIO-17.**

Section B: On-site Measures:

1. Copies of Requirements, Stop Work Authority: The project owner shall provide a copy of the Streambed Impact Minimization and Compensation Measures to all contractors, subcontractors, and the project owner's project supervisors. Copies shall be readily available at work sites at all times during periods of active work and must be presented to any CDFG personnel or personnel from another agency upon demand. The CPM reserves the right to issue a stop work order after giving notice to the project owner, if the CPM, in consultation with CDFG, determines that the project owner is not in compliance with any of the requirements of this condition, including

but not limited to the existence of any of the following:

a. The information provided by the project owner regarding streambed alteration is incomplete or inaccurate;

b. New information becomes available that was not known to the Energy Commission at the time of project certification; or

c. The project or project activities as described in the Supplemental Staff Assessment/ Final Environmental Impact Statement have changed.

2. Best Management Practices: The project owner shall comply with the following conditions to protect drainages near the Project Disturbance Area:

a. The project owner shall not operate vehicles or equipment in ponded or flowing water except as described in this condition.

b. With the exception of the retention basins and drainage control system installed for the project the installation of bridges, culverts, or other structures shall be such that water flow (velocity and low flow channel width) is not impaired. Bottoms of temporary culverts shall be placed at or below stream channel grade.

c. When any activity requires moving of equipment across a flowing drainage, such operations shall be conducted without substantially increasing stream turbidity.

d. Vehicles driven across ephemeral drainages when water is present shall be completely clean of petroleum residue and water levels shall be below the vehicles' axels.

e. The project owner shall minimize road building, construction activities and vegetation clearing within ephemeral drainages to the extent feasible.

f. The project owner shall not allow water containing mud, silt, or other pollutants from grading, aggregate washing, or other activities to enter ephemeral drainages or be placed in locations that may be subjected to high storm flows.

g. The project owner shall comply with all litter and pollution laws. All contractors, subcontractors, and employees shall also obey these laws, and it shall be the responsibility of the project owner to ensure compliance.

h. Spoil sites shall not be located at least 30 feet from the boundaries and drainages or in locations that may be subjected to high storm flows, where spoils might be washed back into drainages.

i. Raw cement/concrete or washings thereof, asphalt, paint or other coating material, oil or other petroleum products, or any other substances that could be hazardous to vegetation or wildlife resources, resulting from project-related activities, shall be prevented from contaminating the soil and/or entering waters of the State. These materials, placed within or where they may enter a drainage by the project owner or any party working under contract or with the permission of the project owner, shall be removed immediately.

j. No broken concrete, debris, soil, silt, sand, bark, slash, sawdust, rubbish, cement or concrete or washings thereof, oil or petroleum products or other organic or

earthen material from any construction or associated activity of whatever nature shall be allowed to enter into, or placed where it may be washed by rainfall or runoff into, waters of the State.

k. When operations are completed, any excess materials or debris shall be removed from the work area. No rubbish shall be deposited within 150 feet of the high water mark of any drainage.

l. No equipment maintenance shall occur within 150 feet of any ephemeral drainage where petroleum products or other pollutants from the equipment may enter these areas under any flow.

m. Stationary equipment such as motors, pumps, generators, and welders, located within or adjacent to a drainage shall be positioned over drip pans. Stationary heavy equipment shall have suitable containment to handle a catastrophic spill/leak. Clean up equipment such as booms, absorbent pads, and skimmers, shall be on site prior to the start of construction.

n. The cleanup of all spills shall begin immediately. The CDFG, BLM Wildlife Biologist, and CPM shall be notified immediately by the project owner of any spills and shall be consulted regarding clean-up procedures.

3. Non-Native Vegetation Removal. The owner shall remove any nonnative vegetation (Consistent with the Weed Management Plan, see Condition of Certification **BIO-1 1)** from any on-site portion of any drainage that requires the placement of a bridge, culvert or other structure. Removal shall be done at least twice annually (Spring/Summer) throughout the life of the Project.

4. Reporting of Special-Status Species: If any special-status species are observed on or in proximity to the project site, or during project surveys, the project owner shall submit California Natural Diversity Data Base (CNDDB) forms and maps to the CNDDB within five working days of the sightings and provide the regional CDFG office with copies of the CNDDB forms and survey maps. The CNDDB form is available online at: www.dfg.ca.gov/whdab/pdfs/natspec.pdf. This information shall be mailed within five days to: California Department of Fish and Game, Natural Diversity Data Base, 1807 1 3th Street, Suite 202, Sacramento, CA 95814, (916) 324-3812. A copy of this information shall also be mailed within five days to CDFG, BLM Wildlife Biologist, and the CPM.

5. Notification: Prior to any activities that cross or have the potential to impact any jurisdictional drainage, the project owner shall provide a detailed map to the CDFG, BLM's Wildlife Biologist, and CPM in a GIS format that identifies all potential crossings of jurisdictional habitats including retention basins, detention basins, reconfigured channels and culverts. The maps shall identify the type of crossing proposed by the owner such as bridges, culverts, or other mechanism and the best management practices that would be employed. The project owner shall notify the CPM, BLM's Wildlife Biologist, and CDFG, in writing, at least five days prior to initiation of project activities in jurisdictional areas and at least five days prior to completion of project activities in jurisdictional areas. The project owner shall notify the CPM, BLM Wildlife Biologist, and CDFG of any change of conditions to the project, the jurisdictional impacts, or the mitigation efforts, if the conditions at the

site of the proposed project change in a manner which changes risk to biological resources that may be substantially adversely affected by the proposed project. The notifying report shall be provided to the CPM, BLM's Wildlife Biologist, and CDFG no later than 7 days after the change of conditions is identified. As used here, change of condition refers to the process, procedures, and methods of operation of a project; the biological and physical characteristics of a project area; or the laws or regulations pertinent to the project, as described below. A copy of the notifying change of conditions report shall be included in the annual reports.

a. Biological Conditions: a change in biological conditions includes, but is not limited to, the following: 1) the presence of biological resources within or adjacent to the project area, whether native or non-native, not previously known to occur in the area; or 2) the presence of biological resources within or adjacent to the project area, whether native or non-native, the status of which has changed to endangered, rare, or threatened, as defined in section 15380 of Title 14 of the California Code of Regulations.

b. Physical Conditions: a change in physical conditions includes, but is not limited to, the following: 1) a change in the morphology of a river, stream, or lake, such as the lowering of a bed or scouring of a bank, or changes in stream form and configuration caused by storm events; 2) the movement of a river or stream channel to a different location; 3) a reduction of or other change in vegetation on the bed, channel, or bank of a drainage, or 4) changes to the hydrologic regime such as fluctuations in the timing or volume of water flows in a river or stream.

c. Legal Conditions: a change in legal conditions includes, but is not limited to, a change in Regulations, Statutory Law, a Judicial or Court decision, or the listing of a species, the status of which has changed to endangered, rare, or threatened, as defined in section 15380 of Title 14 of the California Code of Regulations.

Verification: No fewer than 30 days prior to the start of Pre-Construction Site Mobilization, the project owner shall implement the mitigation measures described in this condition. No fewer than 30 days prior to the start of work potentially affecting waters of the State, the project owner shall provide written verification (i.e., through incorporation into the BRMIMP) to the CPM and BLM's Wildlife Biologist that the above best management practices will be implemented and provide a discussion of work in waters of the State in Compliance Reports for the duration of the project.

Within 30 days after the first anniversary of Pre-Construction Site Mobilization , the project owner shall provide to the CPM for review and approval a report identifying that appropriate mitigation lands have been obtained, verification of the acreage of state jurisdictional streambeds on the compensation lands (to be delineated using methodology identical to the delineation of on-site jurisdictional streambeds and using the most current CDFG guidelines for delineation of state waters), a draft Management Plan for review and approval by the CPM and CDFG, and verification on ongoing enhancement techniques, and a summary of all modifications made to the existing channels on the project site.

EVAPORATION POND DESIGN, MONITORING, AND MANAGEMENT PLAN

BIO-27 The project owner shall install netting over the evaporation ponds and design and implement an Evaporation Pond Design, Monitoring, and Management Plan (Evaporation Pond Plan) to be based upon the draft Evaporation Pond Plan submitted by the project owner. The Plan shall meet the approval of BLM's Wildlife Biologist, and the CPM in consultation with USFWS and CDFG. The goal of the Evaporation Pond Plan shall be to avoid the potential for wildlife mortality associated with the evaporation ponds. The Evaporation Pond Plan shall include: a discussion of the objectives of the Evaporation Pond Plan; a description of project design features such as side slope specifications, freeboard and depth requirements, covering, and fencing; a discussion on the placement of the evaporation pond as to reduce the potential of collision or electrocution of wildlife near the transmission line; avian, pond, and water quality monitoring for selenium and other Title 20 compounds, management actions such as bird deterrence/hazing and water level management, triggers for those management actions; and annual reporting requirements.

Verification: At least 30 days prior to start of any Pre-Construction Site Mobilization, the project owner shall provide the CPM, BLM's Wildlife Biologist, USFWS, and CDFG with the final version of the Evaporation Pond Plan that has been reviewed and approved by BLM and the CPM in consultation with USFWS and CDFG. The CPM and BLM's Wildlife Biologist would determine the plan's acceptability within 15 days of receipt of the final plan. All modifications to the approved Evaporation Pond Plan must be made only after consultation the staff, USFWS, and CDFG. The project owner shall notify the CPM and BLM's Wildlife Biologist no less than 5 working days before implementing any BLM- and CPM-approved modifications to the Evaporation Pond Plan.

Within 30 days after completion of evaporation pond construction, the project owner shall provide to the CPM for review and approval a report identifying which items of the Evaporation Pond Plan have been completed, a summary of all modifications to mitigation measures made during the project's construction phase, and as-built drawings of the evaporation ponds. Throughout the life of the project, the project owner shall provide annual reports on results of the previous year's evaporation plan monitoring, including but not limited to description and summary of wildlife mortality, water quality, and management actions taken or proposed.

CHANNEL DECOMMISSIONING AND RECLAMATION PLAN

BIO-28 Upon project closure, the project owner shall implement a final Decommissioning and Reclamation Plan to remove any engineered diversion channels, detention basins, and other sediment control features from the project site. The goal of the plan shall be to restore the site's topography and hydrology to a relatively natural condition and to establish native plant communities within the Project Disturbance Area. The Channel

Decommissioning and Reclamation Plan shall include a cost estimate for implementing the proposed decommissioning and reclamation activities. The plan and cost estimate shall be consistent with the guidelines in BLM's 43 CFR 3809.550 et seq., subject to review and revisions from BLM's Wildlife Biologist and the CPM in consultation with USFWS and CDFG.

Verification: At least 160 days prior to initiation of reclamation activities, the project owner shall provide to BLM's Wildlife Biologist and the CPM an agency-approved draft Channel Decommissioning and Reclamation Plan. Modifications to the approved Channel Decommissioning Plan shall be made only after approval from BLM's Wildlife Biologist and the CPM, in consultation with USFWS, and CDFG. A final plan shall be approved by the BLM and the CPM no more than 90 days prior to the initiation of reclamation activities.

No more than 10 days prior to start of Pre-Construction Site Mobilization, the project owner shall provide financial assurances to BLM's Wildlife Biologist and the CPM to guarantee that an adequate level of funding would be available to implement measures described in the Channel Decommissioning and Reclamation Plan, pursuant to 43 CFR 3809.550 et seq.

CLOSURE PLAN MEASURES

BIO-29 The project owner shall implement and incorporate into the facility closure plan measures to address the local biological resources related to facility closure. A funding mechanism shall be developed in consultation with staff to ensure sufficient funds are available for revegetation, reclamation, and decommissioning. The facility closure plan shall address biological resources-related mitigation measures. In addition to these measures, the plan must include the following:

1. Removal of transmission conductors when they are no longer used and useful;
2. Removal of all above-ground and subsurface power plant site facilities and related facilities;
3. Methods for restoring wildlife habitat and promoting the reestablishment of native plant and wildlife species;
4. Revegetation of the project site and other disturbed areas utilizing appropriate methods for establishing native vegetation; components of the revegetation plan, including performance standards and monitoring, shall be as described in Condition of Certification **BIO-1 0;**
5. A cost estimate to complete closure-related activities, to be based upon decommissioning costs required under 43 CFR 3809.550 et seq.
6. An implementation and monitoring plan to ensure successful and satisfactory completion of every element of the Facility Closure Plan.

In addition, the project owner shall secure funding to ensure implementation of the plan and provide to the CPM and BLM Wildlife Biologist written evidence of the dedicated funding mechanism(s). The

financial assurances may be in the form of an irrevocable letter of credit, a performance bond, a pledged savings account, or another equivalent form of security, as approved by the CPM and BLM Wildlife Biologist.

Verification: Prior to initiating ground-disturbing project activities, the project owner shall provide financial assurances (as described in this condition, above) to the CPM and BLM Wildlife Biologist to guarantee that an adequate level of funding will be available to implement decommissioning and closure activities described above.

At least 12 months prior to commencement of planned closure activities, the project owner shall address all biological resources-related issues associated with facility closure, and provide final measures, in a Biological Resources Element. The draft planned permanent or unplanned closure measures shall be submitted to the CPM, BLM Wildlife Biologist, CDFG, and USFWS. After revision, final measures shall comprise the Biological Resources Element, which shall include the items listed above as well as written evidence of the dedicated funding mechanism(s) for these measures. The final Biological Resources Element shall become part of the facility closure plan, which is submitted to the CPM and BLM Wildlife Biologist within 90 days of the permanent closure or another period of time agreed to by the CPM and BLM Wildlife Biologist.

In the event of an unplanned permanent closure, or an indeterminate suspension of operations, the project owner shall notify the CPM and BLM Wildlife Biologist , as well as other responsible agencies, by telephone, fax, or e-mail, within 24 hours and shall take all necessary steps to implement the on-site contingency plan (see **Compliance** Conditions of Certification).

Upon facility closure, the project owner shall implement measures in the Biological Resources Element and provide written status updates on all closure activities to the CPM and BLM Wildlife Biologist at a frequency determined by the CPM and BLM's Wildlife Biologist.

IN-LIEU FEE MITIGATION OPTION

BIO-30 The Project owner may choose to satisfy certain compensatory mitigation obligations identified in this Decision by paying an in lieu fee to the Department of Fish and Game pursuant to Fish and Game code sections 2069 and 2099, to the extent the in-lieu fee provision is found by the Commission to be in compliance with CEQA and CESA requirements.

Verification: If electing to use this provision, the Project owner shall notify the Commission that it would like a determination that the in-lieu fee proposal meets CEQA and CESA requirements.

PROJECT CONSTRUCTION AND COMPENSATION PHASING PLAN

BIO-31 As an alternative to providing mitigation or security for the entire project prior to the start of the first ground-disturbing activities, the Project Owner may elect to provide compensatory mitigation for the total Project

Disturbance Area in two phases and may elect to provide security in three phases as specified in this condition.

Only the phases identified as Phase 1 and Phase 2, as described in this condition, in text and maps provided in the Petition for Amendment by the Project Owner may be used for the phasing of mitigation and security requirements. To the extent those sources are found to contain conflicting information about Project phasing, the description in this condition shall control. This condition presumes that the phases identified in this condition are identical to the phases that the Bureau of Land Management (BLM) will authorize work on through issuance of "notices to proceed"; if phases used by BLM are not identical to the phases as described in this condition and the materials identified above, the Project Owner shall obtain separate written authorization from the CPM prior to beginning work on each of the two phases.

Overview of Project Phases

The majority of Phase 1 of the project is located south of the Burlington Northern Santa Fe (BNSF) Railway tracks and will include construction of the perimeter and desert tortoise fencing for Phase 1 and the main access road from the site access at Hector Road to the railroad tracks. It also includes construction of the main services complex, the substation, the water well (north of the tracks) and waterline to the main services complex, and the solar field consisting of Photovoltaic modules mounted on single axis tracking systems to produce up to 275 MW (AC). The water well and the waterline are located in the Project area north of the railroad tracks and will be constructed during Phase 1.

Phase 2 of the project includes construction of the perimeter and desert tortoise fencing for the Project area north of the railroad tracks, the bridge over the BNSF tracks and the continuation of the main access road. It also includes construction of the solar field which will be comprised of up to 288 MW (AC) of single axis tracking PV modules and 100.5 MW of SunCatchers with the SunCatchers to be built towards the center of Phase 2 so as to minimize edge effects caused by the noise and potential glint/glare from the SunCatchers. Phase 2 also includes the hydrogen generation, storage, and distribution system for the SunCatchers.

General Requirements

At no time may the Project Owner perform ground-disturbance to any location outside of the area that has been approved for construction according to the phasing plan identified in this Condition of Certification without the approval of the CPM.

Prior to initiating construction in any phase of the Project, the Project Owner shall comply with all pre-construction requirements in this and other Conditions of Certification and shall notify the CPM that it has obtained a Notice to Proceed for the phase or subphase from the BLM.

Construction activities, including work on linear and non-linear features, shall not occur outside desert tortoise exclusion areas that have been fenced and cleared in accordance with USFWS protocols and as described in Condition of Certification **BIO-15** (Desert Tortoise Clearance and Exclusion Fencing).

The Project Owner shall provide security to ensure implementation of the mitigation requirements in Conditions of Certification **BIO-12** (Special-Status Plant Impact and Avoidance and Minimization), **BIO-13** (Mojave Fringe-Toed Lizard Mitigation), **BIO-16** (Desert Tortoise Translocation Plan), **BIO-17** (Desert Tortoise Compensatory Mitigation), **BIO-21** (Burrowing Owl Impact Avoidance and Minimization Measures), and **BIO-26** (Streambed Impact Minimization and Compensation Measures) for each of the three phases prior to any Project construction associated with that phase. Phasing of security only applies to security required by the Conditions listed above. If the Project Owner elects to phase payments of security, the amount of the security (including payments to NFWF [see definition of security above]) will be adjusted by the CPM in consultation with CDFG, BLM and USFWS prior to each phase to reflect the CPM's best estimate at that time of the estimated costs of land acquisition, long-term management and maintenance costs, and other costs that are included in the security computation. Those costs may be greater than the costs identified in the Conditions of Certification.

Even when security has been provided, the Project Owner shall complete the acquisition, protection and transfer of all compensation lands required in the Conditions of Certification listed above, as well as all funding requirements associated with those lands, within the time periods identified in those Conditions of Certification, except that the time period for providing compensation lands and funding associated with Phase 1 shall be measured from the start of construction of Phase 1, and the period for providing lands and funding required for Phase 2 activities shall be measured from the start of construction of Phase 2.

Additional requirements within the Project's Conditions of Certification that are not expressly phased in this Condition shall be phased as necessary to carry out the purpose of this condition, or to ensure that no project construction occurs in an area for which the Project Owner has not provided security and obtained permission to begin construction. Examples may include such activities as construction and location of desert tortoise exclusion fencing or timing of pre-construction clearance surveys for other species. The Project Owner shall first obtain approval from the CPM, acting in consultation with BLM, CDFG and USFWS, for the phasing of any requirements or deadlines that are not expressly phased in Conditions of Certification.

Detailed Phasing Requirements

Phased impacts and compensation requirements are described in tables below, by phase.

Phase 1

Phase 1 would result in the loss or isolation of 2,1444 acres of desert tortoise habitat from the placement of fencing, road construction, and the development of project facilities. In addition, proposed Phase 1 Project construction would affect Mojave fringe-toed lizard habitat and would affect state-jurisdictional streambeds and, possibly, burrowing owl or rare plant locations that are identified during pre-construction and late-season botanical surveys. The project owner shall provide an enumeration of streambed, burrowing owl, and rare plant habitat impacts and shall provide security for required compensation those impacts as described in Conditions of Certification **BIO-12** (Special-Status Plant Impact and Avoidance and Minimization), **BIO-13** (Mojave Fringe-Toed Lizard Mitigation), **BIO-16** (Desert Tortoise Translocation Plan), **BIO-17** (Desert Tortoise Compensatory Mitigation), **BIO-21** (Burrowing Owl Impact Avoidance and Minimization Measures), and **BIO-26** (Streambed Impact Minimization and Compensation Measures) prior to initiating Project construction associated with Phase 1, as set forth in the verification section of this Condition.

All project access throughout Phase 1 construction shall be via temporary or permanent access as mapped by the project owner. Desert tortoise exclusion fencing shall be installed along the existing temporary construction access routes to allow access and construction of the well and waterline north of the railway prior to other ground disturbance at the project site, and fencing shall be maintained as described in Condition of Certification **BIO-15** (Desert Tortoise Clearance and Exclusion Fencing) until completion of the proposed Main Access Road. Desert tortoise exclusion fencing shall be installed along the proposed Main Access Road alignment prior to beginning construction of that road.

BIO-31 Table 1.
Phase 1 Impacts and Compensation Acreage

Resource	**Phase 1 Impact (acres) and Mitigation Ratios**	**Compensation (acres)**
Direct impact: Desert tortoise habitat	2,140 ac. S of BNSF at 1:1 4 ac. N of BNSF at 3:1	2,152
State Jurisdictional streambed [1]	[to be provided by Project Owner] at 1:1	
Mojave fringe-toed lizard [1]	21.4 acres at 3:1:1 143.3 acres at 331:1	64.2 99143.3
Additional (burrowing owl, special status	[to be provided by Project Owner] 11as	
Total per-acre basis for Phase 1 Security		**3[2] 32,152[2] acres**

1. Compensation may be nested within desert tortoise compensation land.
2. Acreages to be adjusted upon completion of each construction phase and upon confirmation by CPM in consultation with CDFG, USFWS, and BLM of acres impacted.

Phase 2

Phase 2 construction would directly impact 2,473 acres of occupied desert tortoise habitat north of the BNSF railroad tracks. 2,104 acres of which are to be mitigated at a 3:1 ratio, and 369 acres of high-density occupied desert tortoise habitat to be mitigated at the 5:1 ratio. Compensation mitigation ratios for these project components shall be as described in Condition of Certification **BIO-17** (Desert Tortoise Compensatory Mitigation). In addition, proposed Phase 2 Project construction could affect burrowing owl or rare plant locations that may be documented during late-season field surveys. The project owner shall provide the CPM an enumeration of burrowing owl, and rare plant habitat impacts and shall provide security for required compensation of those impacts as described in Conditions of Certification **BIO-12** (Special-Status Plant Impact and Avoidance and Minimization), **BIO-16** (Desert Tortoise Translocation Plan), **BIO-17** (Desert Tortoise Compensatory Mitigation), **BIO-21** (Burrowing Owl Impact Avoidance and Minimization Measures), and **BIO-**26 (Streambed Impact Minimization and Compensation Measures) Security for each phase shall be provided to the CPM, prior to beginning of the start of Pre-Construction Site Mobilization of such phase, as set forth in the verification section of this Condition.

BIO-31 Table 2.
Phase 2 Impacts and Compensation Acreage.

Resource	Phase 2 Impact (acres) and Mitigation Ratios	Compensation (acres)
Desert tortoise habitat at 3:1	2,104 acres at 3:1	6,312
Desert tortoise habitat at 5:1	369 acres at 5:1	1,845
State Jurisdictional streambed	0	0
Additional (burrowing owl, special status	To be provided by the Project Owner.	
Total per-acre basis for Phase 2 Security		**8,157[2] acres**

1. Compensation may be nested within desert tortoise compensation land.
2. Acreages to be adjusted upon completion of each construction phase and upon confirmation by CPM in consultation with CDFG, USFWS, and BLM of acres impacted.

Verification: No fewer than 30 days prior to the start of desert tortoise clearance surveys for each phase, the Project owner shall submit a description of the proposed construction activities for that phase to CDFG, USFWS and BLM for review and to the CPM for review and approval. The description for each phase shall include the proposed construction schedule, a figure depicting the locations of proposed construction and number of acres of rare plant habitat, burrowing owl habitat, and state-jurisdictional streambeds to be disturbed.

If all mitigation requirements, including habitat acquisition and protection, are not completed for a Project phase at least 30 days prior to the start of Pre-

Construction Site Mobilization for that phase, the Project Owner shall provide verification to the CPM and CDFG that approved security (as described in Conditions of Certification **BIO-12** (Special-Status Plant Impact and Avoidance and Minimization), **BIO-13** (Mojave Fringe-Toed Lizard Mitigation), **BIO-16** (Desert Tortoise Translocation Plan), **BIO-17** (Desert Tortoise Compensatory Mitigation), **BIO-21** (Burrowing Owl Impact Avoidance and Minimization Measures), and **BIO26** (Streambed Impact Minimization and Compensation Measures)) has been established in accordance with these Conditions of Certification no later than 30 days prior to start of Pre-Construction Site Mobilization for each phase. Prior to submitting verification regarding the security to the CPM, the project owner shall obtain the CPM's approval of the security as required by the other Conditions.

The Project Owner shall provide written verification to the CPM, CDFG, BLM and USFWS of the compensation lands acquisition, protection, and transfer requirements and satisfaction of associated funding requirements as set forth in **BIO-17** and other conditions within the following time frames: (1) For Phase 1 mitigation, verification shall be provided no later than 18 months after the start of Pre-Construction Site Mobilization of Phase 1, and (2) for Phase 2 mitigation, such verification shall be provided no later than 18 months after the start of Pre-Construction Site Mobilization of Phase 2. Other verification, notification and reporting requirements and other deadlines set forth in BIO-17 and other Conditions that relate to compensation land requirements, to the option of funding mitigation through the NFWF account, or to use of approved third parties to carry out mitigation requirements also apply to Phase 1 and to Phase 2.

Within 90 days after completion of project construction for each project phase, the project owner shall provide to the CPM, CDFG, BLM and USFWS an analysis, based on aerial photography, with the final accounting of the amount of habitat disturbed during Project construction.

DRAINAGE EROSION AND SEDIMENTATION CONTROL PLAN

SOIL&WATER-1 Prior to Pre-Construction Site Mobilization, the project owner shall submit for BNSF's review and comment and to the CPM for review and approval**,** a site specific Drainage, Erosion and Sediment Control Plan (DESCP) that ensures protection of: 1) water quality and soil resources of the project site; 2) all linear features on the project site, including but not limited to maintenance, access and perimeter roads, SunCatchers, power feed lines, and hydrogen lines; 3) all other structures on the project site; and 4) adjacent properties, including the BNSF right of way, for both the construction and operational phases of the project. This plan shall address appropriate methods and actions, both temporary and permanent, on the project site, for the protection of water quality and soil resources, and for the protection of adjacent properties, including the BNSF right of way. The plan shall demonstrate no increase in off-site flooding potential, and no increase in storm water runoff or sediment transport off the project site and onto the BNSF right of way. The plan shall protect the BNSF right of way from storm water runoff and sediment transport in excess of existing conditions. The plan shall identify all monitoring and maintenance activities. The project owner shall complete all necessary engineering plans, reports, and documents necessary for BNSF and the CPM to conduct a review of the proposed project and for the project owner to provide a written evaluation as to whether the proposed grading, drainage improvements, and flood management activities will comply with all requirements presented herein.

The plan shall be developed based upon:

1) the Initial Drainage Report prepared for the applicant by Stantec Consulting dated October 2008;

2) the Drainage Erosion and Sediment Control Plan prepared for the applicant by Huitt Zollars dated August 25, 2009;

3) the Existing Conditions Hydrologic and Hydraulics Study prepared for the applicant by Huitt Zollars dated April 23, 2009 and the alternative mitigation recommendations contained therein; and

4) the Infiltration Report required by Condition of Certification **SOIL&WATER-1 3.**

The plan shall comply at a minimum, with the following:

1) the San Bernardino County Hydrology Manual and 2007 Development Code (amended, March 25, 2010); the regulations of the County of San Bernardino Department of Public Works (CSBDPW);

2) all State SWPPP requirements;

3) FEMA Guidelines for Determining Flood Hazards on Alluvial Fans and Guidelines and Specifications for Flood Hazard Mapping Partners, Appendix G, Guidance for Alluvial Fan Flooding Analyses and Mapping. Specifically, pursuant to the FEMA-administered National Flood Insurance Program adopted by San Bernardino County, the project design shall be based on the assumption that the primary flow from the apex of the alluvial fan may flow to any single location within the site. 44 C.F.R. 65.13.

The DESCP shall contain the following elements:

1) Vicinity Map: A map shall be provided indicating the location of all project elements with depictions of all major geographic features both on the project site and upstream and downstream from the project site, to include watercourses, ephemeral washes, irrigation and drainage canals, major utilities, and sensitive areas.

2) Site Delineation: The site and all project elements shall be delineated showing boundary lines of all construction areas and the location of all existing and proposed structures, underground utilities, roads, drainage facilities and easements. Adjacent property owners shall be identified on the plan maps. All maps shall be prepared at a scale of 1" – 50'. The site delineation shall be based on the State Plane Coordinates System.

3) Drainage: The DESCP shall include the following analyses, in order to verify compliance with the minimum performance standards set forth in **SOIL&WATER-8** (1)(a-p):

   a. Topography. Topography for offsite areas is required to define the existing upstream tributary areas to the site and downstream to provide enough definition to map the existing storm water flow and flood hazard. Spot elevations shall be required where relatively flat conditions exist.

   c. Proposed Grade. Proposed grade contours shall be shown at a scale of 1" – 50' with current mapping to 1' contour interval accuracy in order to accurately delineate onsite ephemeral washes, drainage ditches, and tie-ins to the existing topography. Hydrology. Existing and proposed hydrologic calculations for onsite areas and offsite areas that drain to and from the site; include maps showing the drainage area boundaries and sizes in acres, topography and typical overland flow directions, show all existing, interim, and proposed drainage infrastructure and their resulting direction of flow, and depict where any proposed drainage is intended to alter the direction, velocity or volume of existing flow.

   d. Hydraulics. Provide hydraulic calculations to support the selection and sizing of the onsite drainage network, diversion facilities and Best Management

Practices (BMPs) preventing impacts to project features and the BNSF right of way.

e. Sedimentation. Calculations of existing sediment transport conditions, and an analysis of sediment transport across and off the project site shall be provided.

4) Watercourses and Critical Areas: The DESCP shall show the location of all onsite and nearby watercourses including ephemeral washes, irrigation and drainage canals, and drainage ditches, and shall indicate the proximity of those features to the project site and both sides of the BNSF right of way and other adjacent properties.

5) Clearing and Grading: The plan shall provide a delineation of all areas to be cleared of vegetation, areas to be preserved, and areas where vegetation would be cut to allow clear movement of the SunCatchers. The plan shall require that clearing be kept to a minimum, and shall provide for the planting of approved erosion control vegetation. The plan shall provide elevations, slopes, locations, and extent of all proposed grading as shown by contours, cross-sections, cut/fill depths or other means. The locations of any disposal areas, fills, or other special features shall also be shown. Existing and proposed topography tying in proposed contours with existing topography shall be illustrated. The DESCP shall include a statement of the quantities of material excavated at the site, whether such excavations or fill is temporary or permanent, and the amount of such material to be imported or exported or a statement explaining that there would be no clearing and/or grading conducted for each element of the project. Areas of no disturbance shall be properly identified and delineated on the plan maps.

6) Soil, Wind, and Water Erosion Control: The plan shall address exposed soil treatments to be used during construction and operation of the proposed project for both road and non-road surfaces including the specific identification of all chemical-based dust palliatives, soil bonding, and weighting agents appropriate for use at the proposed project site that would not cause adverse effects to vegetation. BMPs shall include measures designed to prevent wind and water erosion including application of chemical dust palliatives after rough grading to limit water use. The plan shall identify and quantify the area of all surfaces where chemical dust palliatives, soil binders and weighting agents shall be used. The plan shall demonstrate, through these or other control measures, the prevention of changes in the direction, volume or velocity of storm water runoff off the site. The location and use of all dust palliatives, soil binders, and weighting agents shall be approved by the CPM prior to use. The plan shall provide for the regular maintenance of any debris and detention basins or other structural controls. The plan shall also demonstrate on-site roadways and other infrastructure are designed and located to avoid altering existing and proposed flow paths.

7) Project Schedule: The DESCP shall identify on the topographic site map the location of the site-specific BMPs to be employed during each phase of construction (initial grading, project element construction, and final grading/stabilization) and during

operation. Separate BMP implementation schedules shall be provided for each project element for each phase of construction and operation;

8) Best Management Practices: The DESCP shall include BMPs which would prevent project-related adverse impacts to project features or the BNSF right of way. The DESCP shall show the location, timing, and maintenance schedule of all erosion- and sediment-control BMPs to be used prior to initial grading, during project element excavation and construction, during final grading/stabilization, and after construction. BMPs shall include measures designed to control dust and stabilize construction access roads and entrances. The maintenance schedule shall include post-construction maintenance of treatment-control BMPs applied to disturbed areas following construction, which areas may include artificial gullies created along or around project features during weather events.

9) Erosion Control Drawings: The erosion-control drawings and narrative shall be designed, stamped and sealed by a professional engineer or erosion-control specialist.

10) Comments: The DESCP shall include copies of recommendations, conditions, and provisions from the BNSF, County of San Bernardino, California Department of Fish and Game (CDFG), and the Lahontan Regional Water Quality Control Board (LRWQCB) and FEMA.

11) Monitoring Plan: Monitoring activities shall include inspection of erosion and sedimentation control measures, routine measurement of the volume of accumulated sediment in the onsite drainage ditches, and storm water diversions and the requirements specified in Soil and Water Appendix B, C, and D. Monitoring activities shall be conducted prior to each forecasted storm event and following any storm event. A storm event is defined in the verification for this Condition, and any change in the definition shall be provided in advance to BNSF.

Verification: The DESCP shall be consistent with the grading and drainage plan as required by Condition of Certification **CIVIL-1,** and relevant portions of the DESCP shall clearly show approval by the chief building official (CBO). In addition, the project owner shall do all of the following:

a) No later than forty-five (45) days prior to the start of Pre-Construction Site Mobilization, the project owner shall submit a copy of the DESCP to the County of San Bernardino, the LRWQCB, California Department of Fish and Game, FEMA Region IX, BNSF and the CPM for review and comment. The CPM shall consider comments from BNSF received within 15 days of submittal by project owner, in approving the plan.

b) During construction, the project owner shall provide BNSF and the CPM an analysis in the monthly compliance report on the effectiveness of the drainage-, erosion- and sediment-control measures and the results of monitoring and maintenance activities.

c) Once operational, the project owner shall provide BNSF and the CPM information on the results of storm water BMP monitoring and maintenance activities after each storm event and in the annual compliance report. A storm event is defined as rainfall of 10mm or more in a 24-hour period, as measured at or within 1 mile of the Project site.

d) The project owner shall provide BNSF and the CPM with two copies each of all monitoring or other reports required for compliance with San Bernardino County Department of Public Works Flood Control District, CDFG, LRWQCB, and FEMA.

WASTE DISCHARGE REQUIREMENTS

SOIL&WATER-2 The project owner shall comply with the Waste Discharge Requirements presented in the SSA Appendices B, C, D, and E for Soil and Water Resources (Ex. 300, C.7-89-C.7-132) and hereby incorporated by reference, for the design, construction and operation of the surface impoundments (evaporation ponds) and storm water management system. These requirements relate to discharges, or potential discharges, of waste that could affect the quality of waters of the state, and were developed in consultation with staff of the State Water Resources Control Board and/or the applicable California Regional Water Quality Control Board (hereafter "Water Boards"). It is the Commission's intent that these requirements be enforceable by both the Commission and the Water Boards. In furtherance of that objective, the Commission hereby delegates the enforcement of these requirements, and associated monitoring, inspection and annual fee collection authority, to the Water Boards.

Accordingly, the Commission and the Water Board shall confer with each other and coordinate, as needed, in the enforcement of the requirements. The project owner shall pay the annual waste discharge permit fee associated with this facility to the Water Boards. In addition, the Water Boards may "prescribe" these requirements as waste discharge requirements pursuant to Water Code Section 13263 solely for the purposes of enforcement, monitoring, inspection, and the assessment of annual fees, consistent with Public Resources Code Section 25531, subdivision (c).

Verification: No later than sixty (60) days prior to any wastewater or storm water discharge, the project owner shall provide documentation to BNSF and the CPM, with copies to the LRWQCB, demonstrating compliance with the WDRs established in Appendices B, C, D and E. Any changes to the design, construction, or operation of the evaporation ponds or storm water management system shall be requested in writing to the CPM, with copies to BNSF and the LRWQCB, and approved by the CPM, in consultation with the LRWQCB, prior to initiation of any changes. The CPM shall consider comments received within thirty (30) days from BNSF and LRWQCB, in approving the plan. The project owner shall provide to the CPM, with copies to the LRWQCB and BNSF, all monitoring reports required by the WDRs,

and fully explain any violations, exceedances, enforcement actions, or corrective actions related to construction or operation of the ponds or storm water system.

STORM WATER DAMAGE MONITORING AND RESPONSE PLAN

SOIL&WATER-3 The project owner shall ensure that all SunCatcher pole foundations are designed to withstand storm water scour from surface erosion and/or channel migration based on a Scour Analysis and Pole Foundation Stability Report to be completed by a Professional Engineer and Professional Geologist. The Pole Foundation Stability Report shall establish a Minimum Depth Stability Threshold. In developing the Pole Foundation Stability Report, the engineer shall use models approved by FEMA, and shall comply with all applicable FEMA regulations and standards. The Scour Analysis shall consider the unstable nature of high-energy, debris laden stream flows based on supercritical flow depths and velocities and using the correct Equation 6.1 from the Federal Highway Administration's Hydraulic Engineering Circular 18, which has factors of K1, K2, K3, and K4. The additional factors account for the unstable nature of flood flows in steep, alluvial washes during moderate to large flood events. The project owner shall also develop a Storm Water Damage Monitoring and Response Plan to evaluate potential impacts from storm water, including pole foundations that fail due to storm water flow or otherwise break and scatter mirror debris and other SunCatcher components on to the ground surface. The Storm Water Damage Monitoring and Response Plan shall include the following elements:

1. Detailed maps showing the installed location of all SunCatcher pole foundations within each project phase, including existing and proposed drainage channels.

2. Each SunCatcher pole foundation should be identified by a unique ID number marked to show initial ground surface at its base, and the depth to the tip of the pole below ground.

3. Minimum Depth Stability Threshold to be maintained of SunCatcher pole foundations to meet long-term stability for applicable wind, water and debris loading effects, as determined by the Scour Analysis and the Pole Foundation Stability Report.

4) The depth of scour associated with each SunCatcher support, and the natural erosion associated with lateral migration of channels.

5) Above and below ground construction details of a typical installed SunCatcher pole foundation.

6) BMPs to be employed to prevent the potential impact of broken mirrors to soil

resources.

7) Methods and response time of mirror cleanup and measures that may be used to mitigate further impact to soil resources from broken mirror fragments.

8) A demonstration that the project design will withstand erosional forces which could impact site operations, and that would not result in transportation of damaged materials outside the site boundary.

9) A protocol for monitoring and responding to storm events, which shall require communication of response activities to BNSF and the CPM, and coordination with BNSF and the CPM for response activities where applicable.

Monitor and Inspect Site Before First Seasonal and After Every Storm Event:

1) Security and Tortoise Exclusion Fence: Inspect for damage and buildup of sediment or debris.

2) SunCatcher Pole Foundations within Drainages or Subject to Drainage Overflow: Inspect for tilting, mirror damage, depth of scour compared to foundation depth below ground and the Minimum Depth Stability Threshold, collapse, and downstream transport.

3) Drainage Channels: Inspect for substantial migration or changes in depth, and transport of broken mirror glass.

4) Constructed Diversion Channels: Inspect for scour and structural integrity issues caused by erosion, and for sediment and debris buildup.

Documentation: A detailed summary of the periodic inspections and any necessary maintenance and repairs shall be provided to BNSF and the CEC after each inspection.

Short-Term Incident-Based Response:

1) Security and Tortoise Exclusion Fence: repair damage, and remove build-up of sediment and debris.

3) SunCatcher Pole Foundations: Remove broken glass, damaged structures, and wiring from the ground, and for foundations no longer meeting the Minimum Depth Stability Threshold, either replace/reinforce or remove the SunCatcher to avoid exposure for broken glass. Drainage Channels: no short-term response necessary unless changes indicate risk to facility structures.

4) Constructed Diversion Channels: repair damage, maintain erosion control measures and remove built-up sediment and debris.

Long-Term Design-Based Response:

1) Propose operation/BMP modifications to address ongoing issues. Include proposed changes to monitoring and response procedures, frequency, or standards.

2) Replace/reinforce SunCatcher Pole Foundations no longer meeting the Minimum Depth Stability Threshold or remove the SunCatchers to avoid exposure for broken glass.

3) Propose on-site design modifications to address ongoing issues. This may include construction of active on-site storm water management diversion channels, debris basins and/or detention ponds.

4) Inspection, short-term incident response, and long-term design-based response may include activities both inside and outside of the approved right-of-way on BLM land. For activities outside of the approved right-of-way, the Project owner will notify BLM and acquire environmental review and approval before field activities begin.

Verification: At least thirty (30) days prior to the start of Pre-Construction Site Mobilization, the project owner shall submit a copy of the Scour Analysis and Pole Foundation Stability Report and the Storm and the Storm Water Damage Monitoring and Response Plan to BNSF for review and comment and to the CPM for review and approval. The CPM shall consider comments received from BNSF in approving the basis of design report required by **SOIL&WATER-8**. The project owner shall retain a copy of these documents onsite at the power plant at all times. The project owner shall prepare an annual summary of the number of pole foundationsfailed, cause of the failures, and cleanup and mitigation performed for each failed pole foundation

CONSTRUCTION AND OPERATIONS WATER USE

SOIL&WATER-4 The proposed project's use of groundwater for all construction activities shall not exceed 145 AFY. The proposed project's use of groundwater for all operational activities shall not exceed 21 AFY. Use of ground or other water sources in excess of these limits are prohibited unless the project owner seeks a Project Amendment.

Prior to the use of groundwater for construction, the project owner shall install and maintain metering devices as part of the water- supply and distribution system to document project water use and to monitor and record in gallons per day the total volume(s) of water supplied to the project from the water source. Documentation of the installation and operation of the metering devices shall be submitted to the Commission prior to use of any groundwater for project activities. The metering devices shall be operational for the life of the project. An annual summary of daily water use by the project shall be submitted to the CPM in the annual compliance report.

Verification: At least thirty (30) days prior to the start of construction of the proposed

project, the project owner shall submit to the CPM a copy of evidence that metering devices have been installed and are operational.

Beginning six (6) months after the start of construction, the project owner shall prepare a semi-annual summary of amount of water used for construction purposes. The summary shall include the monthly range (daily minimum and daily maximum) and monthly average of daily water usage in gallons per day.

The project owner shall prepare an annual summary, which will include daily usage, monthly range and monthly average of daily water usage in gallons per day, and total water used on a monthly and annual basis in AF. For years subsequent to the initial year of operation, the annual summary will also include the yearly range and yearly average water use by source. For calculating the total water use, the term "year" will correspond to the date established for the annual compliance report submittal.

SEPTIC SYSTEM AND LEACH FIELD REQUIREMENTS

SOIL&WATER-5 The project owner shall provide the design of a sanitary waste septic system that complies with the County of San Bernardino requirements for the construction and operation of the project's proposed sanitary waste septic system and leach field to the CPM for review and approval.

Project operation shall not commence until documentation equivalent to the County's required wastewater treatment system permits are issued by the County and approved by the CPM.

The project owner shall remain in compliance with the County requirements for the life of the project.

Verification: Prior to the start of construction of the main services complex, the Project owner shall submit all necessary information and the appropriate fee to the County of San Bernardino to ensure that the project has complied with the county's sanitary waste disposal facilities requirements. A written assessment prepared by the County of San Bernardino confirming that the design of the project's sanitary waste septic system conforms with county requirements must be provided to the CPM for review and approval thirty (30) days prior to the start of construction of the waste facilities.

A written assessment prepared by the County of San Bernardino of the project's compliance with county's sanitary waste disposal facilities requirements must be provided to the CPM for review and approval sixty (60) days prior to the start of power plant operation.

DECOMMISSIONING PLAN

SOIL&WATER-6

The Project owner shall identify likely decommissioning scenarios and develop specific decommissioning plans for each scenario that will identify actions to be taken to avoid or mitigate long-term impacts related to or resulting from decommissioning project features, including but not limited to roadways and roadway treatments, structures and SunCatchers and PV modules, and water and wind erosion after decommissioning. Actions may include such measures as a decommissioning SWPPP, monitoring of revegetation and restoration of disturbed areas, post-decommissioning maintenance, collection and disposal of project materials and chemicals, and access restrictions.

Verification: At least thirty (30) days prior to Pre-Construction Site Mobilization, the project owner shall submit decommissioning plans to BNSF and the CPM for review and comment. The CPM shall consider comments received within fifteen (15) days, in approving the plan. The project owner shall amend these documents as necessary, with approval from the CPM, should the decommissioning scenario change in the future.

GROUNDWATER LEVEL MONITORING AND REPORTING PLAN

SOIL&WATER-7

The project owner shall submit a Groundwater Monitoring and Management Plan to BNSF and San Bernardino County for review and comment, and to the CPM for review and approval. The CPM's approval shall be in accordance with the County of San Bernardino Code Title 3, Division 3, Chapter 6, Article 5 (Desert Groundwater Management Ordinance).

The Groundwater Monitoring and Management Plan shall provide a detailed methodology for monitoring background and site groundwater levels. Monitoring shall be conducted prior to construction, during construction, and throughout project operation. The primary objective for the monitoring is to establish pre-construction and project related groundwater level trends that can be quantitatively compared against observed and simulated trends near the project pumping well and dedicated monitoring wells. Water level measurements in the project's water supply well shall represent non-pumped conditions, and be collected a minimum of four hours after pump shut-down.

Prior to project construction, monitoring shall commence to establish pre-construction base-line conditions and reporting shall include existing monitoring data collected in the project area useful for quantifying hydraulic gradients across the Pisgah Fault and between the Lavic Lake and Lower Mojave groundwater basins. The monitoring network shall therefore be designed to also incorporate and report relevant ongoing monitoring and reporting activities currently occurring in existing groundwater wells located within the Lavic Lake and Lower Mojave groundwater basins.

In areas where groundwater elevation data is needed but existing wells are absent or do not represent the water-bearing zone from which the project water supply well extracts groundwater, the monitoring network shall be comprised of wells screened to measure water levels representing the water-bearing zone from which the project water supply well will extract groundwater.

In addition, the project owner shall install 5 surveyed monument markers between the Railroad ROW and the water supply well, with one marker adjacent to the supply well. If the measured static groundwater level drops 5' or more, the project owner shall: (1) notify the CPM and BNSF of the drop and (2) prepare a Subsidence Mitigation Plan that will be reviewed and commented on by BNSF, and approved by the CPM.

Verification: The project owner shall complete the following:

a) At least two (2) months prior to Pre-Construction Site Mobilization, a Groundwater Monitoring and Management Plan shall be submitted to BNSF and the County of San Bernardino for review and comment, and to the CPM for review and approval before completion of Condition of Certification **SOIL&WATER-3.** The plan shall include a scaled map showing the site and vicinity, existing well locations, and proposed monitoring locations (both existing wells and new monitoring wells proposed for construction). The map shall also include relevant natural and man-made features (existing and proposed as part of this project). The plan also shall provide: (1) well construction information and borehole lithology for each existing well proposed for use as a monitoring well; (2) description of proposed drilling and well installation methods for new wells; (3) proposed monitoring well design; and, (4) schedule for completion of the work.

b) At least one (1) month prior to Pre-Construction Site Mobilization, a Groundwater Level Network Report shall be submitted to BNSF and to the CPM. The report shall include a scaled map showing the final monitoring well network. It shall document the drilling methods employed, provide individual well construction as-builts, borehole lithology recorded from the drill cuttings, well development, and well survey results for all new wells. The well survey shall measure the location and elevation of the top of the well casing and reference point for all water level measurements, and shall include the coordinate system and datum for the survey measurements. Additionally, the report shall describe the water level monitoring equipment employed in the wells and document their deployment and use.

c) As part of the monitoring well network development, any newly constructed monitoring wells shall be permitted and constructed consistent with San Bernardino County and State specifications.

d) At least one (1) week prior to Pre-Construction Site Mobilization, all water level monitoring data shall be provided to BNSF and to the CPM. The data

transmittal shall include an assessment of pre-project water level trends, a summary of available climatic information (monthly average temperature and rainfall records from the nearest weather station), and a comparison and assessment of water level data.

e) After project construction and during project operations, the project owner shall submit the monitoring data annually to BNSF and to the CPM. The summary shall document water level monitoring methods, the water level data, water level plots, and a comparison between pre- and post-project start-up water level trends. The report shall also include a summary of actual water use conditions, monthly climatic information (temperature and rainfall), and a comparison and assessment of water level data. As part of this assessment, the project owner shall calculate water level trends and complete a 5-year projection of future water levels based on these trends and an evaluation of water supply reliability.

STORMWATER CONTROL/FLOOD PROTECTION DESIGN PLANS

SOIL&WATER-8: Prior to Pre-Construction Site Mobilization, the project owner shall submit two copies of the basis of design report, and the subsequent 30-percent, 60- percent, and 90-percent design drawings for the grading, drainage, and storm water mitigation facilities to BNSF for review, and comment and to the CPM for review and approval. The 30-percent, 60-percent, and 90-percent design drawings for the grading, drainage, and storm water mitigation facilities shall have been preceded by a basis of design report to convey and support the design approach. To prepare the grading, drainage and storm water mitigation facilities drawings and accompanying basis of design report, the project owner shall do the following:

1. At a minimum, the design report shall ensure the project meets the following performance standards:

   a. Project construction and operation shall not alter either the existing watershed or sub-watershed boundaries, as depicted in the Scour/Flood Risk Map: Existing Conditions, Appendix A, page 2, Existing Condition Hydrologic and Hydraulic Study for Solar One (Phase 1 and 2) Project Site, prepared for the applicant by Huitt-Zollars dated April 3, 2009, that flow to the various structures within the BNSF right of way.

   b. Project construction and operation shall not adversely affect any railroad structure, series of structures or embankments through changes in the concentration, volume or velocity of storm water runoff, or the volume of sediment reaching the railroad right of way and all structures within it, and shall not result in increased concentrations of storm water runoff or sediment that could affect the integrity and safety of the BNSF right of way or its operations. Specifically, project owner's on-site drainage improvements shall be designed and constructed to ensure that the BNSF right of way is protected from sediment transport and peak storm water flows resulting from a 100-year, 6-hour

flood event. If required, any of project owner's on-site detention or debris basins shall be designed and constructed to ensure the BNSF right of way is not impacted by flows in excess of existing conditions resulting from a 100-year, 24-hour flood event. In performing this analysis a FEMA approved model for alluvial fans shall be utilized.

c. Subject to subparagraph b above, post-development runoff from the project site shall be equal to or less than predevelopment runoff.

e. Post development sediment transport through the project site shall be equal to predevelopment sediment transport.

f. The project shall not increase erosion of the desert soils or divert storm water from its current path at site boundaries.

g. The project owner's installation grid of SunCatchers and PV modules shall not result in diverting storm water across existing watershed or sub-watershed boundaries.

h. All on-site maintenance and access roads shall be constructed and aligned with existing storm water conveyance channels to ensure the maintenance of current channelization of storm water runoff patterns.

i. Once it is determined where SunCatchers can be located, the burial depth and foundation characteristics shall be based on the Pole Foundation Stability Report and Scour Analysis.

j. No SunCatcher or PV modules shall be placed in an area where, in light of the applicable engineering standards to be used in installing the SunCatchers and PV modules, the hydrologic study indicates the integrity of the installation could be undermined, using the FEMA standards which require the hydrologic analysis to assume that the primary flow from the apex of the alluvial fan flows to said SunCatcher or PV modules.

k. No SunCatcher shall be placed in an area where the computed storm water flows using a hydrologic study for a 100-year, 24-hour storm and following appropriate FEMA guidelines and standards for the distribution of these flows, could result in more scour than is recommended in the Scour Analysis and Pole Foundation Stability Report, using the correct and current local scour equation from the Federal Highway Administration's Hydraulic Engineering Circular 18 (HEC-18), which includes velocity, the characteristics of the natural sediment, and the possibility of unstable wave formations during moderate to large floods.

l. All detention and debris basins or other flood control structures shall fully prevent potential net increases in storm water runoff at the project boundary to the BNSF right of way.

m. All detention and debris basins or other flood control structures shall be sized and located to intercept storm water flow from off-site areas as it enters and flows across the project site.

m. Existing vegetation shall be preserved to the extent possible and erosion control vegetation shall be planted where applicable. Runoff from the project site shall be controlled at all times through the use of appropriate BMP measures.

n. BMPs shall be established to ensure that all drainage control structures are properly maintained.

p. If it is determined that detention basins are needed, size, locate, and design each basin to allow the pass through design storm to move through the site unimpeded while capturing larger design storm flows and related sediment and debris to protect the proposed infrastructure and prevent any increase in quantity or velocity or change in location of storm water runoff or sediment transport to adjacent properties, including the BNSF right of way.

2. Ensure that all deliverables required pursuant to this condition comply with the requirements of:

(i) the San Bernardino County Hydrology Manual and 2007 Development Code (amended, March 25, 2010);

(ii) the regulations of the County of San Bernardino Department of Public Works (CSBDPW);

(iii) all State SWPPP requirements;

(iv) FEMA Guidelines for Determining Flood Hazards on Alluvial Fans and Guidelines and Specifications for Flood Hazard Mapping Partners, Appendix G, Guidance for Alluvial Fan Flooding Analyses and Mapping. Specifically, pursuant to the FEMA-administered National Flood Insurance Program adopted by San Bernardino County, the project design shall be based on the assumption that the primary flow from the apex of the alluvial fan may flow to any single location within the site. (44 C.F.R. 65.13.)

3. Ensure that all maps, plans, surveys and site delineations shall be as current as possible and shall be at a 1”-50’ scale with current mapping to 1’ contour interval accuracy, such that depths of the washes can be accurately understood.

4. A basis of design report that shall include:

a. An analysis to quantify discharges and associated volumes of water, debris, and sediment associated with the 100-year storm at the apex of the alluvial fans under current watershed conditions. A geomorphic and hydraulic analysis to determine the maximum design storm that can be routed through the site utilizing existing fluvial washes that will not result in significant damage to proposed site infrastructure and determine the ability of the proposed site

infrastructure to withstand the storm at the proposed location of said site infrastructure. The result of this analysis shall not conflict with the requirement that the project not contribute to any impacts to the BNSF right of way due to a 100-year storm.

b. A geotechnical report for the project site based on site investigations that includes an analysis of subsurface soil, rock, and water conditions and the effectiveness of design and construction recommendations for roadways, foundations and other improvements in preventing impacts to the BNSF right of way. The report shall contain as a minimum:

(i) Summary of all subsurface exploration data, including subsurface soil profile, exploration logs, laboratory or in situ test results, and ground water information;

(ii) Interpretation and analysis of the subsurface data;

(iii) Specific engineering recommendations for design;

(iv) Specification of conditions for resolution of anticipated problems; and

(v) Recommended geotechnical special provisions.

d. A geomorphic and biologic analysis to determine the minimum design storm that can be routed through the site utilizing existing fluvial washes that will provide the necessary sediment load through the site and "downstream areas" to maintain existing sensitive habitat needs, as described in the Geomorphic Assessment of Calico Solar Project Site. This analysis must consider and address the need for fine sand to support the existing sensitive habitat and the potential episodic nature of the associated dune complex evolution that depends upon El Nino events (i.e., wet winters occurring approximately every three to seven years) delivering sediment to the lower fan and the accompanying La Nina events (i.e., dry winters occurring approximately every three to seven years) eroding and transporting fine sands to these dunes through wind action.

e. A determination of the pass through design storm that can be routed through the site unimpeded to deliver the necessary sediment load through the site to maintain existing sensitive habitat needs in "downstream areas" and not result in significant damage to proposed site infrastructure.

f. Design of each basin or other structural controls by showing supporting calculations and design drawings to convey the basin or other structural controls in plan view, cross-sections, depth to spillway if applicable, amount of freeboard volume of structural control retention, description of sidewall slopes if applicable, method of providing pass through design storm and related sediment unimpeded, method of providing erosion protection of structural control side walls, inlet design, outlet design, spillway design, spillway erosion control, combined outlet maximum flow, transition from outlet to existing

downstream fluvial wash, tortoise fence location and design, maintenance of tortoise fence, maintenance of basin, maintenance of excess sediment in structural controls from larger flood flows. Structural control shall fully prevent potential net increases in storm water flows at the project boundary to the BNSF right of way.

g. For all structural control features that include flood control basin dams, at a minimum:

- specific locations of basins and dams on appropriate scale map,
- configuration of all basins and dams including basin-specific cross sections,
- a description of all materials designed to be used in the construction of the dams,
- footings designs,
- designs of cutoff walls,
- designs of keyways,
- description and design of drainage pass though methods,
- flow metering (ability to maintain maximum discharge to that of the maximum on-site flow design) technique and design,
- method of and design of debris deflection (i.e. trash racks) for each basin,
- emergency spillway design,
- pass through pipe outlet energy dissipation method and design, and basin inlet erosion protection,

5. basin inlet erosion protection. The project owner shall request comments from BNSF and the Department of Water Resources Division of Safety of Dams (DSOD) for the plans and specifications for the construction of any dam(s) or reservoir(s) that are under DSOD jurisdiction prior to beginning construction, and shall forward all comments to BNSF, DSOD and the CPM.

6. The project owner shall prepare a set of design specifications to supplement the 60-percent and 90-percent design drawings for BNSF review and comment. Plans, specifications, computations and other data shall be prepared by persons properly licensed by the State of California. If the 60-percent or 90-percent plans and specifications do not comply with the appropriate Conditions of Certification, the necessary changes or revisions to the plans shall be made by the project owner. If the CPM finds that the work described in the plans and specifications conform to the Conditions of Certifications in the Energy Commission Decision and other pertinent LORS, then the project owner shall submit two copies of the 100-percent set for BNSF review and for CPM review and approval. All design drawings must be submitted on bound or stapled 24" x 36" size paper.

Verification: The project owner shall do all of the following:

a) Prior to Pre-Construction Site Mobilization the project owner shall submit a basis of design report to BNSF for review and comment and to the CPM for review and approval. The CPM shall consider comments received from BNSF within fifteen (15) days of project owner's submittal, in approving the basis of design report.

b) No later than thirty (30) days after the CPM's approval of the basis of design report, the project owner shall submit preliminary (30-percent) grading, drainage, and storm water mitigation facilities drawings and accompanying basis of design report to BNSF for its review, and comment and to the CPM for review and approval. The CPM shall consider comments received from BNSF within fifteen (15) days of project owner's submittal, in approving the 30-percent drawings and accompanying basis of design report.

c) No later than thirty (30) days after the CPM's approval of the 30-percent drawings, the 60-percent set of design drawings and accompanying basis of design report shall be submitted to BNSF for review, and comment and to the CPM for review and approval. The CPM shall consider comments received from BNSF within fifteen (15) days of the project owner's submittal, in approving the 60-percent drawings.

d) After the person who originally drew the plan or their duly authorized agent addresses BNSF's and the CPM's 60-percent submittal comments and the CPM's required changes, the 90-percent set of design drawings and accompanying basis of design report shall be submitted to BNSF for review and comment and to the CPM for review and approval. The CPM shall consider comments received from BNSF within fifteen (15) days of project owner's submittal, in approving the 90- percent drawings.

e) Prior to Pre-Construction Site Mobilization, the 100-percent design drawings and specifications (construction documents) shall be submitted along with the final basis of design report signed and sealed by a Registered Professional Engineer and a Registered Professional Geologist in the State of California to BNSF for review, and comment and to the CPM for review and approval. The CPM shall consider comments received from BNSF within fifteen (15) days of project owner's submittal, in approving the 100-percent drawings. The approved 100-percent design drawings and specifications (construction documents) shall be signed and sealed by a Registered Professional Engineer in the State of California and a Registered Professional Geologist in the State of California and submitted as the final, approved set of construction documents prior to Pre-Construction Site Mobilization.

f) Thirty (30) days prior to initiation of construction of any dams that would be considered under the jurisdiction of DSOD, the project owner shall receive approval for dam construction from the CPM based on comments the CPM has

received from the DSOD for dam design adequacy.

PROJECT WATER SUPPLY MONITORING

SOIL&WATER-9

The annual monitoring report required by **SOIL&WATER-7** shall include an evaluation of water supply reliability. Based on the results of this evaluation, the CPM may request the project owner develop and submit a Water Conservation and Alternative Water Supply Plan. The purpose of this plan is to curtail and minimize water use to remediate observed water level and storage declines in the water bearing zone utilized by the project until the proposed alternative supply is available.

Verification: The project owner shall provide a Water Conservation Plan within thirty (30) days after the request of the CPM. The plan shall be implemented immediately upon approval by the CPM. Part of this plan shall include suspension of[PV panel and] mirror washing until the water supply has stabilized or an alternative supply is available to provide the water. The project owner shall submit a Notice of Completion to the CPM within thirty (30) days of securing the alternative supply. The Notice of Completion shall list each plan component and document that it has been completed. Part of the documentation shall include water use records that show the conservation savings achieved. If development of an alternative water supply was part of the plan, the project owner shall provide all documentation, permits, as-builts, proof of a contract or other right to a long term supply and test results that may be required for the water supply. The Water Conservation Plan shall remain in effect until CPM approval of the project owner's Notice of Completion.

STORM WATER PERMITS

SOIL&WATER-10 NPDES GENERAL PERMIT FOR CONSTRUCTION ACTIVITY.

The project owner shall comply with the Waste Discharge Requirements for discharge of storm water associated with construction activity that are presented in Soil and Water Appendices B, C, D and E and submit the appropriate compliance fee to the LRWQCB. The project owner shall develop, obtain compliance project manager (CPM) approval of, and implement a Storm Water Pollution Prevention Plan (SWPPP) for the construction of the Calico site, laydown area, and all linear facilities.

Verification: At least 60 days prior to site mobilization, the project owner shall submit to the CPM and LRWQCB, a copy of the construction SWPPP for review and CPM approval prior to site mobilization. The project owner shall also submit to the CPM evidence of payment to LRWQCB of the appropriate compliance fee. The project owner shall retain a copy of the SWPPP on site. The project owner shall submit to the CPM copies of all correspondence between the project owner and the LRWQCB regarding the Waste Discharge Requirements for the discharge of storm

water associated with construction activity within 10 days of its receipt or submittal.

SOIL&WATER-1 1 INDUSTRIAL FACILITY SWPPP

The project owner shall comply with the requirements of the Waste Discharge Requirements in Soil and Water Appendices B, C, D and E, for discharges of process water and storm water associated with industrial activity. The project owner shall develop, obtain CPM approval of, and implement an industrial SWPPP for the operation of the project.

Verification: At least 60 days prior to commercial operation, the project owner shall submit to the CPM a copy of the industrial SWPPP for operation of the project for review and approval prior to commercial operation. The project owner shall retain a copy on site. The project owner shall submit copies to the CPM of all correspondence between the project owner and the LRWQCB regarding the Requirements of Waste Discharge of process water and storm water associated with industrial activity within 10 days of its receipt or submittal. Copies of correspondence shall include the Notice of Intent sent by the project owner to the SWRCB.

INFILTRATION REPORT

SOIL&WATER-1 3

Prior to the submission of the deliverables required under **SOIL&WATER-1,** project owner shall prepare an Infiltration Report. The Infiltration Report shall include an analysis of rainfall on the project site, with the objective of quantifying the amount of change in infiltration due to the project. The report shall include a calculation of the amount of storm water runoff for 1) the existing soil conditions, 2) the temporarily disturbed conditions resulting from construction, and 3) the final conditions after the installation of PV modules and SunCatchers and the construction of roads and buildings is complete. This analysis shall be conducted using the 2-year, 5-year, 10-year, and 100-year storm intensities, considering durations of both 6 hours and 24 hours. The Infiltration Report shall identify all areas on the project site where permeability of the ground surface may be changed due to the project, including:

1) the pedestals, of the SunCatchers and post supporting PV modules
2) any areas where facilities will be constructed, fill deposited, or soil compacted;
3) any areas which will be paved or treated with soil stabilizers or soil weighting agents; and
4) any other areas where construction or operational activities may result in

impacts to drainage, vegetation and soil infiltration rates. The report shall include a model of soil-water flow to assess the significance of PV modules and SunCatchers, roadways, soil binders, and construction and operational activities on the effective infiltration over the project site. The amount of impervious surface created by each project feature shall be estimated by considering worst-case conditions. In the case of SunCatchers, this means considering the impact when the SunCatchers are fully deployed. In the case of untreated dirt roads, this means considering long-term compaction caused by construction and maintenance vehicles. In the case of roads treated with soil-binding agents, this means considering the permeability that results from application of the selected treatment.

The Infiltration Report shall also include an analysis based on worst-case vegetation conditions over the life of the project as affected by, without limitation, the following factors: clearance, soil compaction, shading of vegetation by PV modules and SunCatchers, relocation of precipitation by PV modules and SunCatchers, addition of water through the washing of PV module and SunCatchers mirrors, modification of storm water flow by presence ofmodules and SunCatchers and access and maintenance roads, use of dust suppressants, and use of weed management practices.

The Infiltration Report shall be used to determine the change in post-construction run-off caused by the project. The results of the Infiltration Report shall be considered in developing the plans and reports required pursuant to **SOIL&WATER-1** and **SOIL&WATER-8.**

Verification: At least thirty (30) days prior to submitting the deliverables required under **SOIL&WATER-1,** the project owner shall submit an Infiltration Report to BNSF for review and comment and to the CPM for review and approval. The CPM shall consider comments received from BNSF within fifteen (15) days of project owner's submittal in approving the report.

ELECTRONIC DELIVERY OF DOCUMENTS

SOIL&WATER-14

All deliverables submitted by project owner pursuant to the Conditions of Certification, and all engineering plans, reports, documents, maps and surveys relied upon, shall be made available to BNSF and the CPM in electronic format. All surveys and plans shall be provided in AutoCAD, and all reports shall be provided in an editable format to the commenting parties.

CONSISTENCY OF REPORTS, STUDIES, AND PLANS

SOIL&WATER-1 5

All reports, studies, and plans submitted pursuant to SOIL & WATER Conditions of Certification **SOIL&WATER-1 – 13** and Civil Engineering Condition of Certification **CIVIL-1** and **CIVIL-4** shall be based on and utilize consistent

data and assumptions. In the event of any inconsistency, the CPM shall consult with Project Owner, BNSF, and any applicable agencies and determine how to resolve the inconsistency to ensure compliance with the performance standards contained in the **SOIL & WATER** Conditions of Certification.

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CUL-1 The project owner shall obtain the services of a Cultural Resources Specialist (CRS) and one or more alternate CRSs (at the project owner's option).

The CRS shall manage all cultural resources monitoring, mitigation, curation, and reporting activities in accordance with the Conditions of Certification (Conditions). The CRS may elect to obtain the services of Cultural Resources Monitors (CRMs) and other technical specialists, if needed, to assist in monitoring, mitigation, and curation activities. The project owner shall ensure that the CRS makes recommendations regarding the eligibility for listing in the California Register of Historical Resources (CRHR) of any cultural resources that are newly discovered or that may be affected in an unanticipated manner. No Pre-Construction Site Mobilization shall occur prior to Compliance Project Manager (CPM) approval of the CRS and alternates, unless such activities are specifically approved by the CPM.

Approval of a CRS may be denied or revoked for reasons including but not limited to non-compliance on this or other Energy Commission projects. After all ground disturbance is completed and the CRS has fulfilled all responsibilities specified in these cultural resources conditions, the project owner may discharge the CRS, if the CPM approves. With the discharge of the CRS, these cultural resources conditions no longer apply to the activities of this power plant. **Cultural Resources Specialist**

The resumes for the CRS and alternate(s) shall include information demonstrating to the satisfaction of the CPM that their training and backgrounds conform to the U.S. Secretary of Interior's Professional Qualifications Standards, as published in Title 36, Code of Federal Regulations, part 61 (36 C.F.R., part 61). In addition, the CRS shall have the following qualifications:

1. The CRS's qualifications shall be appropriate to the needs of the project and shall include a background in anthropology, archaeology, history, architectural history, or a related field;
2. At least three years of archaeological or historical, as appropriate (per nature of predominant cultural resources on the project site), resource mitigation and field experience in California; and
3. At least one year of experience in a decision-making capacity on cultural resources projects in California and the appropriate training and experience to knowledgably make recommendations regarding the significance of cultural resources.

The resumes of the CRS and alternate CRS shall include the names and telephone numbers of contacts familiar with the work of the CRS/alternate CRS on referenced projects and demonstrate to the satisfaction of the CPM that the CRS/alternate CRS has the appropriate training and experience to implement effectively the Conditions.

Cultural Resources Monitors

CRMs shall have the following qualifications:

1. a B.S. or B.A. degree in anthropology, archaeology, historical archaeology, or a related field, and one year experience monitoring in California; or
2. an A.S. or A.A. degree in anthropology, archaeology, historical archaeology, or a related field, and four years' experience monitoring in California; or
3. enrollment in upper division classes pursuing a degree in the fields of anthropology, archaeology, historical archaeology, or a related field, and two years of monitoring experience in California.

Cultural Resources Technical Specialists

The resume(s) of any additional technical specialist(s), e.g., historical archaeologist, historian, architectural historian, and/or physical anthropologist, shall be submitted to the CPM for approval.

Verification: At least 45 days prior to the start of Pre-Construction Site Mobilization, the project owner shall submit the resume for the CRS, and alternate(s) if desired, to the CPM for review and approval. At least 10 days prior to a termination or release of the CRS, or within 10 days after the resignation of a CRS, the project owner shall submit the resume of the proposed new CRS to the CPM for review and approval. At the same time, the project owner shall also provide to the proposed new CRS the AFC and all cultural resources documents, field notes, photographs, and other cultural resources materials generated by the project. If no alternate CRS is available to assume the duties of the CRS, a monitor may serve in place of a CRS so that ground disturbance may continue up to a maximum of 3 days without a CRS. If cultural resources are discovered then ground disturbance will remain halted until there is a CRS or alternate CRS to make a recommendation regarding significance.

At least 20 days prior to Pre-Construction Site Mobilization, the CRS shall provide a letter naming anticipated CRMs for the project and stating that the identified CRMs meet the minimum qualifications for cultural resources monitoring required by this Condition.

At least 5 days prior to additional CRMs beginning on-site duties during the project, the CRS shall provide letters to the CPM identifying the new CRMs and attesting to their qualifications.

At least 10 days prior to any technical specialists, other than CRMS, beginning tasks, the resume(s) of the specialists shall be provided to the CPM for review and approval.

At least 10 days prior to the start of Pre-Construction Site Mobilization, the project owner shall confirm in writing to the CPM that the approved CRS will be available for onsite work and is prepared to implement the cultural resources conditions.

CUL-2 If the CRS has not previously worked on the project, the project owner shall provide the CRS with copies of the AFC, data responses, confidential cultural resources reports (upon BLM approval), and the Energy Commission's Supplemental Staff Assessment Part II (SSA Part II) and the BLM's Final Environmental Impact Statement (FEIS) for the project. The project owner shall also provide the CRS and the CPM with maps and drawings showing the footprints of the power plant, all linear facility routes, all access roads, and all laydown areas. Maps shall include the appropriate USGS quadrangles and a map at an appropriate scale (e.g., 1:2400 or 1" = 200') for plotting cultural features or materials. If the CRS requests enlargements or strip maps for linear facility routes, the project owner shall provide copies to the CRS and CPM. The CPM shall review map submittals and, in consultation with the CRS, approve those that are appropriate for use in cultural resources planning activities. No ground disturbance shall occur prior to CPM approval of maps and drawings, unless such activities are specifically approved by the CPM.

If construction of the project would proceed in phases, maps and drawings not previously provided shall be provided to the CRS and CPM prior to the start of each phase. Written notice identifying the proposed schedule of each project phase shall be provided to the CRS and CPM.

Verification: At least 15 days prior to the start of Pre-Construction Site Mobilization, the project owner shall provide the AFC, data responses, confidential cultural resources documents, the SSA Part II, and the FEIS to the CRS, if needed, and the subject maps and drawings to the CRS and CPM. The CPM will review submittals in consultation with the CRS and approve maps and drawings suitable for cultural resources planning activities. Project owner shall submit confidential information to the CPM, only after receiving approval from the BLM.

At least 15 days prior to the start of Pre-Construction Site Mobilization, if there are changes to any project-related footprint, the project owner shall provide revised maps and drawings for the changes to the CRS and CPM.

At least 15 days prior to the start of Pre-Construction Site Mobilization of each phase of a phased project, the project owner shall submit the appropriate maps and drawings, if not previously provided, to the CRS and CPM.

Weekly, during Pre-Construction Site Mobilization, a current schedule of anticipated project activity shall be provided to the CRS and CPM by letter, e-mail, or fax.

Within 5 days of changing the scheduling of phases of a phased project, the project owner shall provide written notice of the changes to the CRS and CPM.

CUL-3 Changes to the proposed project or to the character of its construction, operation, and maintenance that may become necessary subsequent to the approval of the project, were such approval to occur, may in turn require the re-consideration of the extent of the original project area. Where such changes indicate the need to alter the original project area to include additional lands that were not elements of analysis during the certification process, the effects of

any proposed changes on historical resources that may be on such lands would need to be taken into account. Changes in the character of the construction, operation, and maintenance of the proposed project may include such actions as decisions to use non-commercial borrow or disposal sites.

Upon the recognition that proposed changes to the project would require the use of lands that were not a part of the original project area of analysis, the project owner shall ensure that the CRS surveys any such lands for cultural resources and record each newly found resource on DPR 523 Series forms. Exceptions would be made to this protocol in cases where cultural resources surveys no greater than five years in age are documented for the entirety of the subject lands and approved by the CPM. Where new cultural resources surveys are warranted, the project owner shall convey the results of such surveys, along with the CRS's recommendations for further action, to the CPM, who will determine whether further action is necessary. If the CPM determines that historical resources may be present and that any such resource may be subject to a substantial adverse change in its significance, the project owner shall ensure that the CRS provides the CPM with substantiated recommendations on whether each such resource is eligible for listing in the CRHR and recommendations for the resolution of any such significant effects. The CRS, the project owner, and the CPM shall then confer on said recommendations, and, upon the concurrence of the CPM with those recommendations, the project owner shall ensure that the CRS proceeds to implement them, and reports on the methods and the results of any such work in the final Cultural Resources Report (CRR) (**CUL-8).**

Verification: Upon the recognition that proposed changes to the project or to the character of the construction, operation, and maintenance of the project would require the use of lands that were not a part of the original project area, the project owner shall notify the CRS and CPM. The project owner shall then provide, for CPM review and approval, documentation of any cultural resources surveys five years or less in age that exist for the additional lands.

At least 105 days prior to the use of the new additional project area lands, in the absence of any such cultural resources surveys or when the extant cultural resources surveys do not cover the entirety of the lands to be added to the project area, the project owner shall ensure that the CRS surveys the additional lands for cultural resources, notifies the project owner and the CPM of the results of the new cultural resources survey, and recommends further action.

No more than 15 days subsequent to the receipt of the information in verification 2, **CUL-3,** above, the CPM shall determine whether historical resources may be present and whether any such resources may be subject to substantial adverse changes in significance.

At least 60 days prior to the use of the new additional project area lands, if the CPM determines that historical resources may be subject to substantial adverse changes in significance, the project owner shall ensure that the CRS provides the CPM with substantiated evaluations, based on archival and field research, on whether each

such resource is eligible for listing in the CRHR and recommendations for the resolution of any potential significant effects.

For no longer than 15 days, the project owner, the CRS, and the CPM shall confer about the above evaluations and recommendations, and, upon the concurrence of the CPM with those evaluations and recommendations, the project owner shall ensure that the CRS proceeds to resolve any significant effects pursuant to the above recommendations prior to the use of the new additional project area lands. The project owner shall ensure that the CRS reports on the methods and the results of all such work in the CRR (**CUL-7).**

Project owner shall submit confidential information to the CPM, only after receiving approval from the BLM.

CUL-4 The project owner shall develop, prepare, and implement a series of protocols the purposes of which will be to gather and analyze information to refine the assessments of the historical significance of the archaeological resources in the project area of analysis. The project owner shall prepare and submit, for the review and approval of the CPM and consistent with the guidance found in the February 1990 "Archaeological Resource Management Reports (ARMR): Recommended Contents and Format" and the February 1991 "Guidelines for Archaeological Research Designs," separate protocols for the CRHR evaluation of each archaeological site type or site type group in the CPM-approved, final archaeological resource taxonomy and for each archaeological district, landscape, or other large-scale archaeological resource in the subject taxonomy. A field methodology will be included in each protocol which outlines a representative sample of 20% of each of the site types which would be selected for further evaluation. Ground disturbance on or in the vicinity of sites selected for evaluation may not commence until the evaluation reports have been completed. Ground disturbance may begin on portions of the project area which do not contain sites selected for further evaluation, subject to the construction monitoring provisions of **CUL-9.** Among the large-scale resources that the project owner shall explicitly are a prehistoric archaeological landscape that encompasses the numerous and diverse individual prehistoric archaeological sites across the desert pavements in the southern portion of the project area, a potential historical archaeological gravel mining district over roughly the western to west-central portion of the project area, and the archaeological remnants of the segment of the National Trails Road in the project area that may be a contributing element to a National Trails Road historic district.

Each CRHR evaluation protocol shall include, at a minimum, the following elements:

1. A background research section which develops interpretive contexts germane to each protocol and which presents information on previous research in the vicinity of the project area, generally, and on previous research on the specific resource types under consideration in the respective protocols.

2. An evaluation phase research design which, in the case of protocols prepared for individual archaeological resource types or type groups, should include a rationalized 20% sample of the resources in a type or type group, rather than a protocol structured to sample 100 percent of the population of a type or type group, and which explicitly takes into account extant information on the subject resources.
3. A detailed and explicit field methodology tailored to acquire the data necessary to address specific research questions.
4. Provisions for specialists to be present on site and specialized laboratory analyses of recovered cultural materials where feasible and if determined necessary to complete CRHR evaluation.
5. Provisions for laboratory analyses of chronometric samples, and organic remains and residues, where feasible and if determined necessary to complete CRHR evaluation.

Where defensible relative to archaeological theory, the project owner may submit documents that, within a single document, tier several separate evaluation protocols from common background research. In such documents, the project owner would develop and present germane prehistoric or historic contexts and present a general review of previous archaeological research in the project area vicinity before laying out the specific evaluation protocols for particular archaeological resources by reviewing previous archaeological research specific to a resource type, type group, or large-scale resource, and then developing and presenting custom research designs for those particular resources.

Subsequent to the completion of the implementation of each protocol, the project owner shall prepare and submit, for the review and approval of the CPM, separate reports on the results of the implementation of each protocol, on the analysis and interpretation of that data, and on the CRHR evaluation of the resource type, type group, or large-scale resource that a subject protocol addresses.

Each CRHR evaluation report shall include, unless otherwise determined by the CPM, the following elements:

1. Synopses of the background research section, evaluation phase research design, field methodology, and material culture, chronometric, and organic analyses as set out in the relevant original evaluation protocol.
2. A detailed, explicit, illustrated presentation of the results of the field and laboratory work done under the relevant protocol.
3. An analysis and behavioral interpretation of data from previous research and of field and laboratory data acquired as the result of the implementation of the relevant protocol.
4. Formal evaluation of the specific resource types relative to the CRHR program. The project owner may lump the evaluation reports into report documents that reflect any prior approved protocol documents that contain more than one protocol.

Should an agreement document be executed in consideration of the proposed action pursuant to 36 CFR §§ 800.6 or 800.14(b) among the Bureau of Land Management or other Federal agencies, and the California State Historic Preservation Officer, with or without the participation of the Advisory Council on Historic Preservation, and should that document provide for the collection of factual evidence sufficient to substantiate the evaluation of the California Register of Historical Resources eligibility of those potentially effected archaeological resources, as determined by the CPM, then the project owner shall adhere to the executed agreement document to mitigate any significant effects. The requirements as set out in the executed agreement document shall supersede the requirements set out above and the requirements set out above would have no further force or effect.

Should the executed agreement document be amended in such a manner that it no longer can be reasonably judged to provide for the collection of factual evidence sufficient to substantiate the evaluation of the California Register of Historical Resources eligibility of those potentially effected archaeological resources, as determined by the CPM, or should the executed agreement document be terminated prior to the complete implementation of the mitigation measures set out in it, then the project owner shall implement the above requirements, in addition to any measures set out under the amended agreement document and in addition to any measures that may have been partially completed prior to the termination of said agreement.

Verification: At least 15 days prior to the start of Pre-Construction Site Mobilization, the project owner shall have submitted all CRHR evaluation protocols to the CPM for review and approval. CPM review will take no longer than 5 days.

At least 60 days prior to the start of Pre-Construction Site Mobilization, which would impact sites selected for further evaluation, the project owner shall have submitted all CRHR evaluation reports to the CPM for review and approval.

Project owner shall submit confidential information to the CPM, only after receiving approval from the BLM.

CUL-5 The project owner shall submit the CRMMP, as prepared by or under the direction of the CRS, to the CPM for review and approval. The CRMMP shall follow the content and organization of the draft model CRMMP, provided by the CPM, and the authors' name(s) shall appear on the title page of the CRMMP. The CRMMP shall identify general and specific measures to minimize potential impacts to sensitive cultural resources. Implementation of the CRMMP shall be the responsibility of the CRS and the project owner. Copies of the CRMMP shall reside with the CRS, alternate CRS, each CRM, and the project owner's on-site construction manager. No ground disturbance shall occur prior to CPM approval of the CRMMP, unless such activities are specifically approved by the CPM.

The CRMMP shall include, but not be limited to, the following elements and measures:

1. The following statement included in the Introduction: "Any discussion, summary, or paraphrasing of the Conditions of Certification in this CRMMP is

intended as general guidance and as an aid to the user in understanding the Conditions and their implementation. The conditions, as written in the Commission Decision, shall supersede any summarization, description, or interpretation of the conditions in the CRMMP. The Cultural Resources Conditions of Certification from the Commission Decision are contained in Appendix A."

2. A proposed general research design that includes a discussion of archaeological research questions and testable hypotheses specifically applicable to the project area, and a discussion of artifact collection, retention/disposal, and curation policies as related to the research questions formulated in the research design. The research design will specify that the preferred treatment strategy for any buried archaeological deposits is avoidance. Specific mitigation plans shall be prepared and submitted, for the review and approval of the CPM, for any unavoidable significant effects to archaeological resource types, type groups, or large-scale archaeological resources determined by the process in **CUL4** to be eligible for listing in the CRHR. Specific mitigation plans shall also be prepared and submitted, pursuant to **CUL-6,** for the review and approval of the CPM, for the unmitigable significant effects that the project will have on U.S. Route 66, and for any other significant effects that the project may have on other significant built-environment resources. Prescriptive treatment plans for construction-related discoveries may also be included in the CRMMP for limited archaeological resource types.

3. Indication of how recovered materials and records will be disposed, taking into account the expressed wishes of the consulting Native Americans.

4. Inclusion of a schedule for providing the consulting Native Americans with periodic updates on implementation of the Treatment Plan. Inclusion of a schedule for completing a final data recovery and discovery report and specify when and to whom this report will be distributed.

5. Inclusion of a curation agreement that ensures that all materials (other than Native American human remains and grave-associated materials) and records are maintained in accordance with 36 CFR Part 79. Materials recovered from privately owned lands, other than Native American human remains and grave-associated materials, that are to be returned to their owners, will be maintained in accordance with 36 CFR Part 79 until their analysis is completed.

6. Specification of the manner in which human remains and grave-associated artifacts recovered during data recovery or discovered during subsequent construction will be treated according to the applicable laws and regulations, and in consultation with the wishes of the consulting Native Americans.

7. Specification of the implementation sequence and the estimated time frames needed to accomplish all project-related tasks during the ground-disturbance and post-ground–disturbance analysis phases of the project.

9. Identification of the person(s) expected to perform each of the tasks, their responsibilities, and the reporting relationships between project construction management and the mitigation and monitoring team.

10 A description of the manner in which Native American observers or monitors will be included, the procedures to be used to select them, and their role and responsibilities.

11. A description of all impact-avoidance measures (such as flagging or fencing) to prohibit or otherwise restrict access to sensitive resource areas that are to be avoided during ground disturbance, construction, and/or operation, and identification of areas where these measures are to be implemented. The description shall address how these measures would be implemented prior to the start of ground disturbance and how long they would be needed to protect the resources from project-related effects.

12. A statement that all encountered cultural resources over 50 years old shall be recorded on Department of Parks and Recreation (DPR) 523 forms and mapped and photographed. In addition, all archaeological materials retained as a result of the archaeological investigations (survey, testing, data recovery) shall be curated in accordance with the California State Historical Resources Commission's *Guidelines for the Curation of Archaeological Collections,* into a retrievable storage collection in a public repository or museum. A statement that the project owner will pay all curation fees for artifacts recovered and for related documentation produced during cultural resources investigations conducted for the project. The project owner shall identify three possible curation facilities that could accept cultural resources materials resulting from project activities.

13. A statement that the CRS has access to equipment and supplies necessary for site mapping, photography, and recovery of any cultural resource materials that are encountered during ground disturbance and cannot be treated prescriptively.

14. A description of the contents, format, and review and approval process of the final Cultural Resource Report (CRR), which shall be prepared according to ARMR guidelines.

Verification: Upon approval of the CRS proposed by the project owner, the CPM will provide to the project owner an electronic copy of the draft model CRMMP for the CRS.

At least 30 days prior to the start of ground disturbance, the project owner shall submit the CRMMP to the CPM for review and approval.

At least 30 days prior to the start of ground disturbance, in a letter to the CPM, the project owner shall agree to pay curation fees for any materials generated or collected as a result of the archaeological investigations (survey, testing, and data recovery).

Within 90 days after completion of ground disturbance (including landscaping), if

cultural materials requiring curation were generated or collected, the project owner shall provide to the CPM a copy of an agreement with, or other written commitment from, a curation facility that meets the standards stated in the California State Historical Resources Commission's *Guidelines for the Curation of Archaeological Collections,* to accept the cultural materials from this project. Any agreements concerning curation will be retained and available for audit for the life of the project.

Project owner shall submit confidential information to the CPM, only after receiving approval from the BLM.

CUL-6

Project owner executed an agreement document pursuant to 36 CFR §§ 800.6 or 800.14(b) with the Bureau of Land Management or other Federal agencies, and the California State Historic Preservation Officer, which provides for HALS Level I or II documentation to mitigate the significant effects of the proposed action on US Route 66.

Verification: At least 30 days prior to the start of Pre-Construction Site Mobilization, the project owner shall submit verification to the CPM that the agreement document has been executed and the project owner is in compliance with the terms of the agreement document.

CUL-7 The project owner shall submit the final Cultural Resources Report (CRR) to the CPM for approval. The final CRR shall be written by or under the direction of the CRS and shall be provided in the ARMR format. The final CRR shall report on all field activities including dates, times and locations, results, samplings, and analyses. All survey reports, Department of Parks and Recreation (DPR) 523 Series forms, data recovery reports, and any additional research reports not previously submitted to the California Historical Resource Information System (CHRIS) and the State Historic Preservation Officer (SHPO) shall be included as appendices to the final CRR.

If the project owner requests a suspension of ground disturbance and/or construction activities, then a draft CRR that covers all cultural resources activities associated with the project shall be prepared by the CRS and submitted to the CPM for review and approval on the same day as the suspension/extension request. The draft CRR shall be retained at the project site in a secure facility until ground disturbance and/or construction resumes or the project is withdrawn. If the project is withdrawn, then a final CRR shall be submitted to the CPM for review and approval at the same time as the withdrawal request.

Verification: Within 30 days after requesting a suspension of construction activities, the project owner shall submit a draft CRR to the CPM for review and approval. Project owner shall submit confidential information to the CPM, only after receiving approval from the BLM.

Within 90 days after completion of Pre-Construction Site Mobilization, the project owner shall submit the final CRR to the CPM for review and approval. If any reports have previously been sent to the CHRIS, then receipt letters from the CHRIS or other verification of receipt shall be included in an appendix.

Within 10 days after CPM approval of the CRR, the project owner shall provide documentation to the CPM confirming that copies of the final CRR have been provided to the SHPO, the CHRIS, the curating institution, if archaeological materials were collected, and to the Tribal Chairpersons of any Native American groups requesting copies of project-related reports.

CUL-8 The project owner shall provide Worker Environmental Awareness Program (WEAP) training to all new workers within their first week of employment at the project site, along the linear facilities routes, and at laydown areas, roads, and other ancillary areas. The training shall be prepared by the CRS, may be conducted by any member of the archaeological team, and may be presented in the form of a video. The CRS shall be available (by telephone or in person) to answer questions posed by employees. The training may be discontinued when ground disturbance is completed or suspended, but must be resumed when ground disturbance, such as landscaping, resumes.

The training shall include:

1. A discussion of applicable laws and penalties under the law;
2. Samples or visuals of artifacts that might be found in the project vicinity;
3. A discussion of what such artifacts may look like when partially buried, or wholly buried and then freshly exposed;
4. A discussion of what prehistoric and historical archaeological deposits look like at the surface and when exposed during construction, and the range of variation in the appearance of such deposits;
5. Instruction that the CRS, alternate CRS, and CRMs have the authority to halt ground disturbance in the area of a discovery to an extent sufficient to ensure that the resource is protected from further impacts, as determined by the CRS;
6. Instruction that employees are to halt work on their own in the vicinity of a potential cultural resources discovery and shall contact their supervisor and the CRS or CRM, and that redirection of work would be determined by the construction supervisor and the CRS;
7. An informational brochure that identifies reporting procedures in the event of a discovery;
8. An acknowledgement form signed by each worker indicating that they have received the training; and
9. A sticker that shall be placed on hard hats indicating that environmental training has been completed.

No ground disturbance shall occur prior to implementation of the WEAP program, unless such activities are specifically approved by the CPM.

Verification: At least 30 days prior to the start of Pre-Construction Site Mobilization, the CRS shall provide the training program draft text and graphics and the informational brochure to the CPM for review and approval.

At least 15 days prior to the start of Pre-Construction Site Mobilization, the CPM will provide to the project owner a WEAP Training Acknowledgement form for each WEAP-trained worker to sign.

Monthly, until ground disturbance is completed, the project owner shall provide in the Monthly Compliance Report (MCR) the WEAP Training Acknowledgement forms of workers who have completed the training in the prior month and a running total of all persons who have completed training to date.

CUL-9 The project owner shall ensure that the CRS, alternate CRS, or CRMs monitor full time all ground disturbance at the project site, along the linear facilities routes, and at laydown areas, roads, and other ancillary areas, to ensure there are no impacts to undiscovered resources and to ensure that known resources are not impacted in an unanticipated manner.

Full-time archaeological monitoring for this project shall be the archaeological monitoring of ground disturbance for as long as the activities are ongoing. An archaeological monitor shall be made available to observe both the active ground-disturbance/excavation of soils, as well as the disposal of any removed soils. The number of monitors required shall be determined by the CRS. It is anticipated that during the monitoring effort the archaeological monitors will be moving in and around the construction equipment in order to meaningfully inspect the soils. The archaeological monitors shall observe the ground-disturbance and/or soil disposal activities within a close enough distance to reasonably allow for the detection of cultural artifacts and/or features that could potentially be unearthed during construction, no farther away than 50 feet, or as otherwise directed by the CPM.

A Native American monitor shall be invited to monitor ground disturbance, in the presence of an archaeological monitor, in areas where Native American artifacts may be discovered. Contact lists of interested Native Americans and guidelines for monitoring shall be obtained from the Native American Heritage Commission. Preference in selecting a monitor shall be given to Native Americans with traditional ties to the area that shall be monitored. If efforts to obtain the services of a qualified Native American monitor are unsuccessful, the project owner shall immediately inform the CPM. The CPM will either identify potential monitors or will allow ground disturbance to proceed without a Native American monitor.

The research design in the CRMMP shall govern the collection, treatment, retention/disposal, and curation of any archaeological materials encountered.

On forms provided by the CPM, CRMs shall keep a daily log of any monitoring and other

cultural resources activities and any instances of non-compliance with the Conditions and/or applicable LORS. Copies of the daily monitoring logs shall be provided by the CRS to the CPM, if requested by the CPM. From these logs, the CRS shall compile a monthly monitoring summary report to be included in the MCR. If there are no monitoring activities, the summary report shall specify why monitoring has been suspended.

The CRS or alternate CRS shall report daily to the CPM on the status of the project's cultural resources-related activities, unless reducing or ending daily reporting is requested by the CRS and approved by the CPM.

In the event that the CRS believes that the current level of monitoring is not appropriate in certain locations, a letter or e-mail detailing the justification for changing the level of monitoring shall be provided to the CPM for review and approval prior to any change in the level of monitoring.

The CRS, at his or her discretion, or at the request of the CPM, may informally discuss cultural resources monitoring and mitigation activities with Energy Commission technical staff.

Cultural resources monitoring activities are the responsibility of the CRS. Any interference with monitoring activities, removal of a monitor from duties assigned by the CRS, or direction to a monitor to relocate monitoring activities by anyone other than the CRS shall be considered non-compliance with these Conditions.

Upon becoming aware of any incidents of non-compliance with the Conditions and/or applicable LORS, the CRS and/or the project owner shall notify the CPM by telephone or e-mail within 24 hours. The CRS shall also recommend corrective action to resolve the problem or achieve compliance with the Conditions. When the issue is resolved, the CRS shall write a report describing the issue, the resolution of the issue, and the effectiveness of the resolution measures. This report shall be provided in the next MCR for the review of the CPM.

Verification: At least 15 days prior to the start of Pre-Construction Site Mobilization, the CPM will provide to the CRS an electronic copy of a form to be used as a daily monitoring log.

Monthly, while monitoring is on-going, the project owner shall include in each MCR a copy of the monthly summary report of cultural resources-related monitoring prepared by the CRS and shall attach any new DPR 523A forms completed for finds treated prescriptively, as specified in the CRMMP.

At least 24 hours prior to implementing a proposed change in monitoring level, the project owner shall submit to the CPM, for review and approval, a letter or email (or some other form of communication acceptable to the CPM) detailing the CRS's justification for changing the monitoring level.

Daily, as long as no cultural resources are found, the CRS shall provide a statement that "no cultural resources over 50 years of age were discovered" to the CPM as an e-mail or in some other form of communication acceptable to the CPM.

At least 24 hours prior to reducing or ending daily reporting, the project owner shall submit to the CPM, for review and approval, a letter or e-mail (or some other form of communication acceptable to the CPM) detailing the CRS's justification for reducing or ending daily reporting.

No later than 30 days following the discovery of any Native American cultural materials, the project owner shall submit to the CPM copies of the information transmittal letters sent to the Chairpersons of the Native American tribes or groups who requested the information. Additionally, the project owner shall submit to the CPM copies of letters of transmittal for all subsequent responses to Native American requests for notification, consultation, and reports and records.

Within 15 days of receiving them, the project owner shall submit to the CPM copies of any comments or information provided by Native Americans in response to the project owner's transmittals of information.

Project owner shall submit confidential information to the CPM, only after receiving approval from the BLM.

CUL-10 The project owner shall grant authority to halt ground disturbance to the CRS, alternate CRS, and the CRMs in the event of a discovery. Redirection of ground disturbance shall be accomplished under the direction of the construction supervisor in consultation with the CRS.

In the event that a cultural resource over 50 years of age is found (or if younger, determined exceptionally significant by the CPM), or impacts to such a resource can be anticipated, ground disturbance shall be halted or redirected in the immediate vicinity of the discovery sufficient to ensure that the resource is protected from further impacts. Monitoring and daily reporting, as provided in other conditions, shall continue during the project's ground-disturbing activities elsewhere. The halting or redirection of ground disturbance shall remain in effect until the CRS has visited the discovery, and all of the following have occurred:

1. The CRS has notified the project owner, and the CPM has been notified within 24 hours of the discovery, or by Monday morning if the cultural resources discovery occurs between 8:00 AM on Friday and 8:00 AM on Sunday morning, including a description of the discovery (or changes in character or attributes), the action taken (i.e., work stoppage or redirection), a recommendation of CRHR eligibility, and recommendations for data recovery from any cultural resources discoveries, whether or not a determination of CRHR eligibility has been made.
2. If the discovery would be of interest to Native Americans, the CRS has notified all Native American groups that expressed a desire to be notified in the event of such a discovery.
3. The CRS has completed field notes, measurements, and photography for a DPR 523 "Primary" form. Unless the find can be treated prescriptively, as specified in the CRMMP, the "Description" entry of the DPR 523 "Primary" form shall include a recommendation on the

CRHR eligibility of the discovery. The project owner shall submit completed forms to the CPM.

4. The CRS, the project owner, and the CPM have conferred, and the CPM has concurred with the recommended eligibility of the discovery and approved the CRS's proposed data recovery, if any, including the curation of the artifacts, or other appropriate mitigation; and any necessary data recovery and mitigation have been completed.

Verification: At least 15 days prior to the start of Pre-Construction Site Mobilization, the project owner shall provide the CPM and CRS with a letter confirming that the CRS, alternate CRS, and CRMs have the authority to halt ground disturbance in the vicinity of a cultural resources discovery, and that the project owner shall ensure that the CRS notifies the CPM within 24 hours of a discovery, or by Monday morning if the cultural resources discovery occurs between 8:00 AM on Friday and 8:00 AM on Sunday morning.

Within 48 hours of the discovery of a resource of interest to Native Americans, the project owner shall ensure that the CRS notifies all Native American groups that expressed a desire to be notified in the event of such a discovery. Unless the discovery can be treated prescriptively, as specified in the CRMMP, completed DPR 523 forms for resources newly discovered during ground disturbance shall be submitted to the CPM for review and approval no later than 24 hours following the notification of the CPM, or 48 hours following the completion of data recordation/recovery, whichever the CRS decides is more appropriate for the subject cultural resource.

Project owner shall submit confidential information to the CPM, only after receiving approval from the BLM.

CUL-11: If human remains are encountered, State Health and Safety Code Section 7050.5 states that no further disturbance shall occur until the County Coroner has made necessary findings as to origin and disposition of the remains pursuant to Public Resources Code Section 5097.98. The following actions, or other equally protective actions provided for in the Native American Grave Protection and Repatriation Act or the Programmatic Agreement, must be taken in the event that human remains are discovered on Federal, private or State land:

1) Stop work immediately and contact the County Coroner must be notified immediately of the find and the BLM archaeologist shall be notified concurrently.

2) The Coroner has two working days to examine human remains after being notified by the responsible person. If the remains are determined to be prehistoric of Native American origin, the BLM will notify the Native American Heritage Commission,

3) The Native American Heritage Commission will immediately notify the person it believes to be the most likely descendent of the deceased Native American. With the permission of the landowner or agency or an authorized

representative, the MLD may inspect the site of the discovery; and

4) The most likely descendent makes recommendations to the owner, or representative, for the treatment or disposition, with proper dignity, of the human remains and grave goods.

If the commission is unable to identify a descendent, or the descendent identified fails to make a recommendation, or the landowner rejects the recommendations of the descendent and the mediation provided for in subdivision (k) of Section 5097.94 fails to provide measures acceptable to the landowner, the landowner or his or her authorized representative shall reinter the human remains and items associated with the Native American burial(s) with appropriate dignity on the property in a location not subject to further subsurface disturbance.

GEO-1 The two Alquist-Priolo faults (Pisgah fault and the Lavic Lake fault) shall be located (if actually present) by trenching or suitable geophysical methods with sufficient accuracy and confidence to assure that no occupied structures are placed within 50 feet, either side, of an established fault trace or any identified splays. Other structures deemed critical to the project, by the owner, may also be set back, as practical, prudent and appropriate.

Verification: At least 30 days prior to Pre-Construction Site Mobilization the project owner shall submit a fault evaluation report signed and stamped by a geologist licensed in the state of California. The evaluation shall include sufficient field exploration to establish whether or not either or both faults (or their splays) extend onto the project site. Surveyed locations shall be obtained for any faults encountered and a map showing the fault locations in relation to project structures shall be provided. Onsite faults shall be considered active unless conclusive field evidence shows otherwise.

GEO-2 Because of the embankments on the downhill side, the proposed storm water detention basins constitute detention dams, some of which may be large enough to be under the jurisdiction of the State of California, Department of Water Resources, Division of Safety of Dams. Each detention dam site shall be characterized in a geotechnical investigation to establish foundation conditions and assess geologic hazards that affect embankment design. Appropriate geotechnical recommendations shall be provided for use in design and construction of the embankments and the associated storage area. All dams must be designed by a California licensed geotechnical or civil engineer familiar with design of small dams.

Verification: At least 60 days prior to ground breaking for the detention basins, the project owner shall submit a geotechnical investigation report covering each proposed detention basin. Appropriate geotechnical recommendations and specifications shall be provided for use in design and construction of the embankments and the associated storage area. All detention facilities can be included in a single report or in the overall final project geotechnical report. One set of stamped design drawings, typical of the detention dams, must be submitted by the project owner, prior to starting detention dam construction.

GEO-3 The California Department of Water Resources, Division of Safety of Dams has jurisdiction over proposed and existing dams that impound 50 acre-feet of water or more. Embankments six feet high or less are excluded, regardless of storage capacity and embankments impounding less than 15 acre-feet of water are excluded, regardless of height. Any detention basin meeting the Division of Safety of Dams jurisdictional criteria for a dam shall be permitted through that agency.

Verification: If final detention basin design results in no jurisdictional dams, the project owner shall submit a letter of verification from the design engineer. If one or

more detention basins fall within the jurisdiction of the Division of Safety of Dams, the project owner shall submit copies of the permit application(s) to the Division of Safety of Dams. Upon completion of construction of jurisdictional dams, the project owner shall submit copies of acceptance documents from the Division of Safety of Dams.

PAL-1 The project owner shall provide the Compliance Project Manager CPM with the resume and qualifications of its paleontological resource specialist (PRS) for review and approval. If the approved PRS is replaced prior to completion of project mitigation and submittal of the Paleontological Resources Report, the project owner shall obtain CPM approval of the replacement PRS. The project owner shall keep resumes on file for qualified paleontological resource monitors (PRMs). If a PRM is replaced, the resume of the replacement PRM shall also be provided to the CPM.

The PRS resume shall include the names and phone numbers of references. The resume shall also demonstrate to the satisfaction of the CPM the appropriate education and experience to accomplish the required paleontological resource tasks.

As determined by the CPM, the PRS shall meet the minimum qualifications for a vertebrate paleontologist as described in the Society of Vertebrate Paleontology (SVP) guidelines of 1995. The experience of the PRS shall include the following:

1. Institutional affiliations, appropriate credentials, and college degree;
2. Ability to recognize and collect fossils in the field;
3. Local geological and biostratigraphic expertise;
4. Proficiency in identifying vertebrate and invertebrate fossils; and
5. At least three years of paleontological resource mitigation and field experience in California and at least one year of experience leading paleontological resource mitigation and field activities.

The project owner shall ensure that the PRS obtains qualified paleontological resource monitors to monitor as he or she deems necessary on the project. Paleontological resource monitors (PRM) shall have the equivalent of the following qualifications:

- BS or BA degree in geology or paleontology and one year of experience monitoring in California; or
- AS or AA in geology, paleontology, or biology and four years' experience monitoring in California; or
- Enrollment in upper division classes pursuing a degree in the fields of geology or paleontology and two years of monitoring experience in California.

Verification: At least 30 days prior to the start of Pre-Construction Site Mobilization, the project owner shall submit a resume and statement of availability of its designated PRS for on-site work.

At least 20 days prior to start of Pre-Construction Site Mobilization, the PRS or project owner shall provide a letter with resumes naming anticipated monitors for the project,

stating that the identified monitors meet the minimum qualifications for paleontological resource monitoring required by the Condition. If additional monitors are obtained during the project, the PRS shall provide additional letters and resumes to the CPM. The letter shall be provided to the CPM no later than one week prior to the monitor's beginning on-site duties.

Prior to the termination or release of a PRS, the project owner shall submit the resume of the proposed new PRS to the CPM for review and approval.

PAL-2 The project owner shall provide to the PRS and the CPM, for approval, maps and drawings showing the footprint of the power plant, construction lay-down areas, and all related facilities. Maps shall identify all areas of the project where ground disturbance is anticipated. If the PRS requests enlargements or strip maps for linear facility routes, the project owner shall provide copies to the PRS and CPM. The site grading plan and plan and profile drawings for the utility lines would be acceptable for this purpose. The plan drawings should show the location, depth, and extent of all ground disturbances and be at a scale between 1 inch = 40 feet and 1 inch = 100 feet. If the footprint of the project or its linear facilities changes, the project owner shall provide maps and drawings reflecting those changes to the PRS and CPM.

If construction of the project proceeds in phases, maps and drawings may be submitted prior to the start of each phase. A letter identifying the proposed schedule of each project phase shall be provided to the PRS and CPM. Before work commences on affected phases, the project owner shall notify the PRS and CPM of any construction phase scheduling changes.

At a minimum, the project owner shall ensure that the PRS or PRM consults weekly with the project superintendent or construction field manager to confirm area(s) to be worked the following week and until ground disturbance is completed.

Verification: At least 30 days prior to the start of Pre-Construction Site Mobilization, the project owner shall provide the maps and drawings to the PRS and CPM.

If there are changes to the footprint of the project, revised maps and drawings shall be provided to the PRS and CPM at least 15 days prior to the start of Pre-Construction Site Mobilization.

If there are changes to the scheduling of the construction phases, the project owner shall submit a letter to the CPM within 5 days of identifying the changes.

PAL-3 The project owner shall ensure that the PRS prepares, and the project owner submits to the CPM for review and approval, a PRMMP to identify general and specific measures to minimize potential impacts to significant paleontological resources. Approval of the PRMMP by the CPM shall occur prior to any ground disturbance. The PRMMP shall function as the formal guide for monitoring, collecting, and sampling activities and may be modified with CPM approval. This document shall be used as the basis of discussion

when on-site decisions or changes are proposed. Copies of the PRMMP shall reside with the PRS, each monitor, the project owner's on-site manager, and the CPM.

The PRMMP shall be developed in accordance with the guidelines of the SVP (1995) and shall include, but not be limited, to the following:

1. Assurance that the performance and sequence of project-related tasks, such as any literature searches, pre-construction surveys, worker environmental training, fieldwork, flagging or staking, construction monitoring, mapping and data recovery, fossil preparation and collection, identification and inventory, preparation of final reports, and transmittal of materials for curation will be performed according to PRMMP procedures;
2. Identification of the person(s) expected to assist with each of the tasks identified within the PRMMP and the Conditions of Certification;
3. A thorough discussion of the anticipated geologic units expected to be encountered, the location and depth of the units relative to the project when known, and the known sensitivity of those units based on the occurrence of fossils either in that unit or in correlative units;
4. An explanation of why, how, and how much sampling is expected to take place and in what units. Include descriptions of different sampling procedures that shall be used for fine-grained and coarse-grained units;
5. A discussion of the locations of where the monitoring of project construction activities is deemed necessary, and a proposed plan for monitoring and sampling;
6. A discussion of procedures to be followed in the event of a significant fossil discovery, halting construction, resuming construction, and how notifications will be performed;
7. A discussion of equipment and supplies necessary for collection of fossil materials and any specialized equipment needed to prepare, remove, load, transport, and analyze large-sized fossils or extensive fossil deposits;
8. Procedures for inventory, preparation, and delivery for curation into a retrievable storage collection in a public repository or museum, which meet the Society of Vertebrate Paleontology's standards and requirements for the curation of paleontological resources;
9. Identification of the institution that has agreed to receive data and fossil materials collected, requirements or specifications for materials delivered for curation and how they will be met, and the name and phone number of the contact person at the institution; and 10. A copy of the paleontological Conditions of Certification.

Verification: At least 30 days prior to start of Pre-Construction Site Mobilization, the project owner shall provide a copy of the PRMMP to the CPM. The PRMMP shall include an affidavit of authorship by the PRS and acceptance of the PRMMP by the project owner evidenced by a signature.

PAL-4 Prior to ground disturbance and for the duration of construction activities involving ground disturbance, the project owner and the PRS shall prepare and conduct weekly CPM-approved training for the following workers: project managers, construction supervisors, foremen, and general workers involved with or who operate ground-disturbing equipment or tools. Workers shall not excavate in sensitive units prior to receiving CPM-approved worker training. Worker training shall consist of an initial in-person PRS training during the project kick off for those mentioned above. Following initial training, a CPM approved video or in-person training may be used for new employees. The training program may be combined with other training programs prepared for cultural and biological resources, hazardous materials, or other areas of interest or concern. No ground disturbance shall occur prior to CPM approval of the Worker Environmental Awareness Program (WEAP), unless specifically approved by the CPM.

The WEAP shall address the possibility of encountering paleontological resources in the field, the sensitivity and importance of these resources, and legal obligations to preserve and protect those resources.

The training shall include:

1. A discussion of applicable laws and penalties under the law;
2. Good quality photographs or physical examples of vertebrate fossils for project sites containing units of high paleontological sensitivity;
3. Information that the PRS or PRM has the authority to halt or redirect construction in the event of a discovery or unanticipated impact to a paleontological resource;
4. Instruction that employees are to halt or redirect work in the vicinity of a find and to contact their supervisor and the PRS or PRM;
5. An informational brochure that identifies reporting procedures in the event of a discovery;
6. A WEAP certification of completion form signed by each worker indicating that he/she has received the training; and
7. A sticker that shall be placed on hard hats indicating that environmental training has been completed.

Verification: At least 30 days prior to start of Pre-Construction Site Mobilization, the project owner shall submit the proposed WEAP, including the brochure, with the set of reporting procedures for workers to follow.

At least 30 days prior to start of Pre-Construction Site Mobilization, the project owner shall submit the script and final video to the CPM for approval if the project owner is planning to use a video for interim training.

If the owner requests an alternate paleontological trainer, the resume and qualifications of the trainer shall be submitted to the CPM for review and approval prior to installation of

an alternate trainer. Alternate trainers shall not conduct training prior to CPM authorization.

In the monthly compliance report (MCR), the project owner shall provide copies of the WEAP certification of completion forms with the names of those trained and the trainer or type of training (in-person or video) offered that month. The MCR shall also include a running total of all persons who have completed the training to date.

PAL-5 The project owner shall ensure that the PRS and PRM(s) monitor consistent with the PRMMP all construction-related grading, excavation, trenching, and augering in areas where potential fossil-bearing materials have been identified, both at the site and along any constructed linear facilities associated with the project. In the event that the PRS determines full-time monitoring is not necessary in locations that were identified as potentially fossil bearing in the PRMMP, the project owner shall notify and seek the concurrence of the CPM.

The project owner shall ensure that the PRS and PRM(s) have the authority to halt or redirect construction if paleontological resources are encountered. The project owner shall ensure that there is no interference with monitoring activities unless directed by the PRS. Monitoring activities shall be conducted as follows:

1. Any change of monitoring from the accepted schedule in the PRMMP shall be proposed in a letter or email from the PRS and the project owner to the CPM prior to the change in monitoring and will be included in the monthly compliance report. The letter or email shall include the justification for the change in monitoring and be submitted to the CPM for review and approval.
2. The project owner shall ensure that the PRM(s) keep a daily monitoring log of paleontological resource activities. The PRS may informally discuss paleontological resource monitoring and mitigation activities with the CPM at any time.
3. The project owner shall ensure that the PRS notifies the CPM within 24 hours of the occurrence of any incidents of noncompliance with any **Paleontological Resources** Conditions of Certification. The PRS shall recommend corrective action to resolve the issues or achieve compliance with the conditions of certification.
4. For any significant paleontological resources encountered, either the project owner or the PRS shall notify the CPM within 24 hours, or Monday morning in the case of a weekend event, where construction has been halted because of a paleontological find.

The project owner shall ensure that the PRS prepares a summary of monitoring and other paleontological activities placed in the monthly compliance reports. The summary will include the name(s) of PRS or PRM(s)

active during the month; general descriptions of training and monitored construction activities; and general locations of excavations, grading, and other activities. A section of the report shall include the geologic units or subunits encountered, descriptions of samplings within each unit, and a list of identified fossils. A final section of the report will address any issues or concerns about the project relating to paleontological monitoring, including any incidents of non-compliance or any changes to the monitoring plan that have been approved by the CPM. If no monitoring took place during the month, the report shall include an explanation in the summary as to why monitoring was not conducted.

Verification: The project owner shall ensure that the PRS submits the summary of monitoring and paleontological activities in the MCR. When feasible, the CPM shall be notified 10 days in advance of any proposed changes in monitoring different from the plan identified in the PRMMP. If there is any unforeseen change in monitoring, the notice shall be given as soon as possible prior to implementation of the change.

PAL-6 The project owner, through the designated PRS, shall ensure that all components of the PRMMP are adequately performed including collection of fossil materials, preparation of fossil materials for analysis, analysis of fossils, identification and inventory of fossils, the preparation of fossils for curation, and the delivery for curation of all significant paleontological resource materials encountered and collected during project construction.

Verification: The project owner shall maintain in his/her compliance file copies of signed contracts or agreements with the designated PRS and other qualified research specialists. The project owner shall maintain these files for a period of three years after project completion and approval of the CPM-approved paleontological resource report (see Condition of Certification **PAL-7).** The project owner shall be responsible for paying any curation fees charged by the museum for fossils collected and curated as a result of paleontological mitigation. A copy of the letter of transmittal submitting the fossils to the curating institution shall be provided to the CPM.

PAL-7 The project owner shall ensure preparation of a Paleontological Resources Report (PRR) by the designated PRS. The PRR shall be prepared following completion of the ground-disturbing activities. The PRR shall include an analysis of the collected fossil materials and related information and submit it to the CPM for review and approval.

The report shall include, but is not limited to, a description and inventory of recovered fossil materials; a map showing the location of paleontological resources encountered; determinations of sensitivity and significance; and a statement by the PRS that project impacts to paleontological resources have been mitigated below the level of significance.

Verification: Within 90 days after completion of project construction, including landscaping, the project owner shall submit the PRR under confidential cover to the CPM.

TRANS-1– Construction of All-Weather Roads and Bridge. The project owner shall construct the main services road using asphalt and all other roads using Soiltac or its equivalent according to California State Fire Marshall specifications as outlined in California Fire Code Section 902.2.1 et seq. These roads shall be constructed with appropriate materials so that they will be safe for use in crossing washes at the site.

In addition, the Project owner shall coordinate its activities, relating to permanent crossing of the railroad, with the BNSF Railway. Those activities include working with the Public Utilities Commission to ensure compliance with provisions of the California Public Utilities Code Sections 1201- 1220.

During construction of the permanent crossing of BNSF tracks, the Project owner shall prepare and coordinate with BNSF Railway; California Public Utilities Commission; and Federal Railroad Administration a safety plan for ensuring that all state and federal safety requirements for railroad crossings are followed.

That plan shall be reviewed and coordinated with BNSF Railway, appropriate regulatory agencies, and the CPM to ensure compliance with all state and federal requirements and approved by those agencies s well as the CPM.

Verification: At least 30-days prior to the start of construction of permanent crossing, project owner shall provide to CPM a copy of right-of-way easements for the permanent crossing from BNSF and all documents pertaining to approvals from the Federal Railroad Administration (FRA); and the California Public Utilities Commission (CPUC). A courtesy copy shall be provided to the California Department of Transportation (Caltrans), District 8 Office. Within 30 days after the completion of each railroad crossing improvement, the project owner shall provide the CPM with a copy of written approvals from BNSF, FRA, and CPUC as to the adequacy and safety of the roads and bridge.

TRANS-2 – Traffic Control Plan. The project owner shall prepare and implement a traffic control plan (TPC) for the project's construction and operation traffic. The plan shall address the movement of workers, vehicles, and materials, including arrival and departure schedules and designated workforce and delivery routes.

For the project's construction period, the plan is to be designed to take into account any impediments that may or could occur because of the need to cross BNSF Railway tracks. In developing this plan the Project owner

is required to consider off-site parking and staging in designated areas and the use of buses to transport workers to and from the construction site.

Once the bridge is constructed, the Project owner shall prepare a parking and staging plan to require all project-related parking to occur on-site or in designated off-site parking areas and that staging occurs on-site in a specifically-defined area. The project owner shall consult with the BNSF Railway; County of San Bernardino; and the California Department of

Transportation (Caltrans) District 8 office in the preparation and implementation of the plan and shall submit the proposed traffic control plan to the BNSF Railway; County of San Bernardino; and Department of Transportation (Caltrans) District 8 office in sufficient time for review and comment. The plan, along with any written comments from the BNSF Railway, County of San Bernardino; and Department of Transportation (Caltrans) District 8 office, shall then be submitted to the Energy Commission Compliance Program Manager (CPM) for review and approval prior to the proposed start of construction and implementation of the plan.

The traffic control plan shall include:

- A work schedule and end-of-shift departure plan designed to ensure that stacking does not occur on intersections necessary to enter and exit the project site. The project owner shall consider using one or more of the following measures designed to prevent stacking: (1) staggered work shifts; (2) off-peak work schedules; and (3) restricting travel to and departures from the project site to ten or fewer vehicles every three minutes during peak travel hours on Interstate 40.

- Provisions for at least two flaggers stationed at the BNSF Railway crossing during each day of construction until the proposed bridge is constructed and operating. Flaggers shall be present at the BNSF Railway crossing to ensure the safe crossing of workers, visitors, and delivery persons arriving and leaving the project site.
- Provisions for an incentive program such as an employer-sponsored Commuter Check Program to encourage construction workers to carpool or use van or bus service or both.
- Provisions for delivering and staging of heavy equipment and building material deliveries as well as for the movement of hazardous materials to the site.
- Schedule truck deliveries to the project site to maximize off-peak hours and to ensure adequate exit and entry at appropriate intersections and railroad tracks.
- On I-40, provisions for direction and redirection of construction traffic with flag persons as necessary to ensure traffic safety and minimize interruptions to non-construction-related traffic flow.
- Placement of signage, lighting, and traffic control devices at the project construction site and laydown areas.
- Signage along eastbound and westbound appropriate roads and at the entrance of the Hector Road I-40 northbound and southbound off-ramps to notifying drivers of construction traffic throughout the duration of the construction period.
- A heavy-haul plan designed to address the transport and delivery of heavy and oversized loads requiring permits from Department of Transportation (Caltrans) or other state and federal agencies.

- Parking for workforce and construction vehicles, including consideration of off-site parking prior to opening of bridge across BNSF Railway tracks, to prevent stacking on I-40 roads and intersections and facilitate timely and safer crossing across tracks for workers, visitors, and delivery persons as well as for emergency access.

Verification: At least 30-days prior to the start of Pre-Construction Site Mobilization, the project owner shall submit the proposed traffic control plan to BNSF Railway; San Bernardino County; and the Department of Transportation (Caltrans) District 8 office for review and comment and to the CPM for review and approval. The project owner shall also provide the CPM with a copy of the transmittal letter to BNSF Railway; San Bernardino County; and the Department of Transportation (Caltrans) District 8 office requesting review and comment.

At least 30 calendar days prior to the start of Pre-Construction Site Mobilization, the project owner shall provide copies of any comment letters received from BNSF Railway; San Bernardino County; and the Department of Transportation (Caltrans) District 8 office along with any changes to the proposed traffic control plan for CPM review and approval.

TRANS-3 – Limitations on Vehicle Size and Weight.

1. Road Crossing. The project owner shall consult with San Bernardino County and the Caltrans District 8 office to coordinate procedures for obtaining required and necessary easements and permits for road crossings, on an as-needed basis.

After consultation with San Bernardino County, and the Caltrans Office District 8 office, the project owner shall prepare a coordination plan designed to comply with limitations imposed by California Department of Transportation (Caltrans) District 8 office and other relevant jurisdictions including San Bernardino County on vehicle sizes and weights. In addition, the project owner or its contractor shall obtain necessary transportation permits from Caltrans and all relevant jurisdictions for use of roadways.

2. Railroad Crossings. The project owner shall consult with BNSF to coordinate procedures for obtaining required and necessary easements and permits for railroad crossings, on an as-needed basis.

Verification: At least 30 days prior to construction of a crossing, project owner shall provide to the CPM applicable copies of easements and permits obtained from BNSF Railway; San Bernardino County; or the Caltrans District 8 office to the CPM and a copy of any required coordination plan.

In the Monthly Compliance Reports (MCRs), the project owner shall submit copies of any easements or permits or both received during that reporting period. In addition, the project owner shall retain copies of these permits and supporting documentation in its compliance file for at least six months after the start of commercial operation. The project owner shall retain copies of BNSF easements for the life of the project.

TRANS-4 – Encroachment into Public Rights of Way. The project owner and its contractor shall comply with Caltrans and other relevant jurisdictions limitations for encroachment into public rights-of-way and shall obtain necessary encroachment permits from Caltrans and all relevant jurisdictions.

Verification: In the monthly compliance reports (MCRs), the project owner shall submit copies of permits received during the reporting period. In addition, the project owner shall retain copies of these permits and supporting documentation in its compliance file for at least six months after the start of commercial operation.

TRANS 5 – Restoration of All Public Roads, Easements, and Rights-of-Way. The project owner shall restore all public roads, easements, and rightsof-way that have been damaged due to project-related construction activities to original or near-original condition in a timely manner, as directed by the CPM. Repairs and restoration of access roads may be required at any time during the construction phase of the project to assure safe ingress and egress.

Verification: At least 30 days prior to the start of Pre-Construction Site Mobilization, the project owner shall photograph or videotape all affected public roads, easements, and right-of-way segments and/or intersections and shall provide the CPM, the affected local jurisdictions, and Caltrans (if applicable) with a copy of these images. The project owner shall rebuild, repair and maintain all public roads, easements, rights-of-way in a usable condition throughout the construction phase of the project.

In addition, the project owner shall consult with the County of San Bernardino and California Department of Transportation (Caltrans) District 8 and notify them of the proposed schedule for project construction. The purpose of this notification is to request that San Bernardino County and Caltrans consider postponement of public right-of-way repair or improvement activities in areas affected by project construction until construction is completed and to coordinate with the project owner regarding any concurrent construction-related activities that are planned or in progress and cannot be postponed. The purpose of this requirement is to help ensure cooperation from San Bernardino County and Caltrans so that the Project owner's construction work is accommodated and the project can be completed in a timely and safe manner.

TRANS 6 – Permits/Licenses to Transport Hazardous Materials. The project owner shall ensure that permits and/or licenses are secured from the California Highway Patrol and Caltrans for the transport of hazardous materials.

Verification: The project owner shall include in its monthly compliance reports (MCRs), copies of all permits and licenses acquired by the project owner or contractors or both concerning the transport of hazardous substances.

TRANS-7 –Glint and Glare Study

Project owner shall coordinate with BNSF to conduct, at project owner's expense, a glint and glare study to determine the impacts from glint and glare on (a) rail operations,

including a train crew's ability to see accurately and respond to signals, (b) other modes of transportation on Hector Road, Route 66 and Interstate 40, and (c) the health of rail employees, agents or contractors, resulting from the placement of SunCatchers and/or the PV modules on the Project site.

Verification: Prior to Pre-Construction Site Mobilization, project owner shall provide the results of the glint and glare study to the CPM for review and approval.

NOTIFICATION OF NOISE COMPLAINT PROCESS

NOISE-1 The project owner shall notify all residents within two miles of the site, by mail or other effective means, of the commencement of project construction. At the same time, the project owner shall establish a telephone number for use by the public to report any undesirable noise conditions associated with the construction and operation of the project and include that telephone number in the above notice. If the telephone is not staffed 24 hours per day, the project owner shall include an automatic answering feature, with date and time stamp recording, to answer calls when the phone is unattended. This telephone number shall be posted at the project site during construction in a manner visible to passersby. This telephone number shall be maintained until the project has been operational for at least one year.

Verification: At least 15 days prior to the start of Pre-Construction Site Mobilization, the project owner shall transmit to the Compliance Project Manager (CPM) a statement, signed by the project owner's project manager, stating that the above notification has been performed and describing the method of that notification, verifying that the telephone number has been established and posted at the site, and giving that telephone number.

NOISE COMPLAINT PROCESS

NOISE-2 Throughout the construction and operation of the project, the project owner shall document, investigate, evaluate, and attempt to resolve all project-related noise complaints. The project owner or authorized agent shall:

- Use the Noise Complaint Resolution Form (below), or a functionally equivalent procedure acceptable to the CPM, to document and respond to each noise complaint;
- Attempt to contact the person(s) making the noise complaint within 24 hours;
- Conduct an investigation to determine the source of noise related to the complaint;
- Take all feasible measures to reduce the noise at its source if the noise is project related; and
- Submit a report documenting the complaint and the actions taken. The report shall include: a complaint summary, including final results of noise reduction efforts, and if obtainable, a signed statement by the complainant stating that the noise problem is resolved to the complainant's satisfaction.

Verification: Within five days of receiving a noise complaint, the project owner shall file a copy of the Noise Complaint Resolution Form with the CPM, documenting the

resolution of the complaint. If mitigation is required to resolve a complaint, and the complaint is not resolved within a three-day period, the project owner shall submit an updated Noise Complaint Resolution Form when the mitigation is implemented.

NOISE CONTROL PROGRAM

NOISE-3 The project owner shall submit to the CPM for review and approval a noise control program and a statement, signed by the project owner's project manager, verifying that the noise control program will be implemented throughout construction of the project. The noise control program shall be used to reduce employee exposure to high noise levels during construction and also to comply with applicable OSHA and Cal/OSHA standards.

Verification: At least 30 days prior to the start of Pre-Construction Site Mobilization, the project owner shall submit to the CPM the noise control program and the project owner's project manager's signed statement. The project owner shall make the program available to Cal/OSHA upon request.

NOISE RESTRICTIONS

NOISE-4 The project design and implementation shall include appropriate noise mitigation measures adequate to ensure that the operation of the project will not cause the noise levels due to plant operation alone to exceed an average of 51 dBA $_{Leq}$ measured at or near monitoring location SR2, and an average of 57 dBA $_{Leq}$ measured at or near monitoring location SR1.

No new pure-tone components shall be caused by the project. "Pure-tone" shall be understood to mean, for purposes of this Condition, a prominent one-third octave band with prominence evaluated between adjacent one-third octave band project operation sound levels and using frequency-dependent prominence ratio criteria values similar to those as defined by ANSI S1.13-2005 A.8.6. No single piece of equipment shall be allowed to stand out as a source of noise that draws legitimate complaints.

A. When the project first achieves a sustained output of 85 percent or greater of rated capacity, the project owner shall conduct a 25-hour community noise survey at monitoring location SR2, or at a closer location acceptable to the CPM. This survey shall also include measurement of one-third octave band sound pressure levels to ensure that no new pure-tone noise components have been caused by the project.

B. During the period of this survey, the project owner shall also conduct a short-term survey of noise at monitoring location SL1 or at a closer location acceptable to the CPM. The short-term noise measurements at this location shall be conducted during morning, early afternoon, and evening hours.

C. The measurement of power plant noise for the purposes of demonstrating compliance with this Condition of Certification may alternatively be made at a location, acceptable to the CPM, closer to the plant (e.g., 400 feet

from the plant boundary) and this measured level then mathematically extrapolated to determine the plant noise contribution at the affected residence. The character of the plant noise shall be evaluated at the affected receptor locations to determine the presence of pure tones or other dominant sources of plant noise.

D. If the results from the noise survey indicate that the power plant noise at the affected receptor sites exceeds the above specified values, mitigation measures shall be implemented to reduce noise to a level of compliance with these limits.

E. If the results from the noise survey indicate that pure tones are present, mitigation measures shall be implemented to eliminate the pure tones.

Verification: The survey shall take place within 30 days of the SunCatcher portion of the project first achieving a sustained output of 85 percent or greater of rated capacity. Within 15 days after completing the survey, the project owner shall submit a summary report of the survey to the CPM. Included in the survey report will be a description of any additional mitigation measures necessary to achieve compliance with the above listed noise limit, and a schedule, subject to CPM approval, for implementing these measures. When these measures are in place, the project owner shall repeat the noise survey.

Within 15 days of completion of the new survey, the project owner shall submit to the CPM a summary report of the new noise survey, performed as described above and showing compliance with this Condition.

OCCUPATIONAL NOISE SURVEY

NOISE-5 Following the project's first achieving a sustained output of 80 percent or greater of rated capacity of the SunCatcher portion of electrical production, the project owner shall conduct an occupational noise survey to identify the noise hazardous areas in the facility.

The survey shall be conducted by a qualified person in accordance with the provisions of Title 8, California Code of Regulations sections 5095–5099 and Title 29, Code of Federal Regulations section 1910.95. The survey results shall be used to determine the magnitude of employee noise exposure.

The project owner shall prepare a report of the survey results and, if necessary, identify proposed mitigation measures that will be employed to comply with the applicable California and federal regulations.

Verification: Within 30 days after completing the survey, the project owner shall submit the noise survey report to the CPM. The project owner shall make the report available to OSHA and Cal/OSHA upon request.

CONSTRUCTION TIME RESTRICTIONS

NOISE-6 Heavy equipment operation, including pile driving, and noisy

construction[1] work relating to any project features shall be restricted to the times of day delineated below, unless:

- the project owner obtains the consent of the homeowners at SR1 and SR2; or
- the CPM determines that the noise will not exceed the daytime ambient noise levels at SR1 and SR2 (as shown in **Noise Table 5)** by more than 10 dBA and the nighttime ambient noise levels at SR1 and SR2 (as shown in **Noise Table 5)** by more than 5 dBA; or
- construction that is expected to increase those daytime ambient noise levels at those locations by more than 10 dBA continues no longer than four consecutive weekends or construction that is expected to increase nighttime ambient noise levels at those locations by more than 5 dBA continues no longer than five consecutive nights.

Mondays through Saturdays:	7:00 a.m. to 7:00 p.m.
Sundays and Holidays:	No Construction Allowed

Haul trucks and other engine-powered equipment shall be equipped with mufflers that meet all applicable regulations. Haul trucks shall be operated in accordance with posted speed limits. Truck engine exhaust brake use shall be limited to emergencies.

Verification: Prior to start of Pre-Construction Site Mobiilzation, the project owner shall transmit to the CPM a statement acknowledging that the above restrictions will be observed throughout the construction of the project.

At least 20 days prior to the start of construction activities to occur outside the above required schedule restrictions, the project owner shall submit to the CPM a letter showing the affected homeowner's consent. If the consent cannot be obtained, at least 15 days prior to the start of those activities, the project owner shall submit to the CPM documentation showing the expected construction noise levels at SR1 and SR2, the nature of the work, the time of day/night that work will occur, and the duration of the work.

[1] Noisy Construction: "Noise that can potentially draw legitimate complaints."
Legitimate Complaint: "A legitimate noise complaint refers to a complaint about noise that is confirmed by the CPM to be disturbing, and that is caused by the Calico project as opposed to another source. A legitimate complaint constitutes a violation by the project of any noise condition of certification (as confirmed by the CPM), which is documented by an individual or entity affected by such noise."

SURFACE TREATMENT OF NON-MIRROR PROJECT STRUCTURES AND BUILDINGS

VIS-1 To the extent feasible, the project owner shall treat all non-mirror surfaces of all project structures and buildings visible to the public, which specifically does not include PV modules, such that a) their colors minimize visual intrusion and contrast by blending with the existing tan and brown color of the surrounding landscape; b) their colors and finishes do not create excessive glare; and c) their colors and finishes are consistent with local policies and ordinances. The transmission line conductors shall be non-specular and non-reflective, and the insulators shall be non-reflective and non-refractive. This measure shall include coloring of security fencing with vinyl or other non-reflective coating including galvanized steel; or with slats or similar semi-opaque, non-reflective material, to blend to the greatest feasible extent with the background soil.

The project owner shall submit for CPM and BLM review and approval, a specific Surface Treatment Plan that will satisfy these requirements. The treatment plan shall include:

A. A description of the overall rationale for the proposed surface treatment, including the selection of the proposed color(s) and finishes;

B. A list of each major project structure, building, tank, pipe, and wall; the transmission line towers and/or poles; and fencing, specifying the color(s) and finish proposed for each including galvanized steel. Colors must be identified by vendor, name, and number; or according to a universal designation system;

C. One set of color brochures or color chips showing each proposed color and finish;

D. A specific schedule for completion of the treatment; and

E. A procedure to ensure proper treatment maintenance for the life of the project.

The project owner shall not specify to the vendors the treatment of any buildings or structures treated during manufacture, or perform the final treatment on any buildings or structures treated in the field, until the project owner receives notification of approval of the treatment plan by the CPM and BLM. Subsequent modifications to the treatment plan are prohibited without CPM and BLM approval.

Verification: At least 90 days prior to specifying to the vendor the colors and finishes of the first structures or buildings that are surface treated during manufacture, the project owner shall submit the proposed treatment plan to the CPM and BLM for review and approval and simultaneously to San Bernardino County for review and comment. The project owner shall provide to the CPM copies of the transmittal letters submitted separately to BLM and San Bernardino County requesting review of the plan.

Comments received on the surface treatment plan shall be provided to the CPM.

If BLM and/or the CPM determine that the plan requires revision, the project owner shall provide a plan with the specified revision(s) for review and approval by BLM and the CPM before any treatments are applied. Any modifications to the treatment plan must be submitted to BLM and the CPM for review and approval.

Prior to the start of commercial operation, the project owner shall notify BLM and the CPM that surface treatments of all listed structures and buildings have been completed and that the facilities are ready for inspection. Prior to the scheduled inspection, the project owner shall submit two sets of electronic color photographs from each of the key observation points to BLM and the CPM. The project owner shall obtain written confirmation from BLM and the CPM that the project complies with the surface treatment plan.

The project owner shall provide a status report regarding surface treatment maintenance in the Annual Compliance Report. The report shall specify a) the condition of the surfaces of all structures and buildings at the end of the reporting year; b) maintenance activities that occurred during the reporting year; and c) the schedule of maintenance activities for the next year.

TEMPORARY AND PERMANENT EXTERIOR LIGHTING

VIS-2 To the extent feasible and consistent with safety and security considerations, the project owner shall design and install all temporary and permanent exterior lighting so that:

a) lighting does not cause excessive reflected glare;

b) lighting does not illuminate the nighttime sky;

c) mounting heights and locations of all lighting fixtures, including roadway lighting, will not allow light to fall on the mirror surfaces of the SunCatchers in the stowed position, and

d) illumination of the project and its immediate vicinity is minimized as to times of use and extent.

e) Permanent night lighting shall comply with all applicable standards, practices, and regulations including, and specifically, the following Illuminating Engineering Society documents:

- RP-33-99 Lighting for Exterior Environments
- TM-1 0-00 Addressing Obtrusive Light (Urban Sky Glow and Light Trespass) in Conjunction with Roadway Lighting
- TM-1 5-07 Luminaire Classification System for Outdoor Luminaires

Verification: At least 90 days prior to ordering any permanent exterior lighting, the project owner shall contact BLM and the CPM to discuss the requirements listed above. Topics to address shall include at a minimum, final lighting plans, fixture and

control schedules, fixture and control cut sheets and specifications, a photometric plan showing vertical and horizontal footcandles at all property lines to a height of 20 feet, and the proposed time clock schedule.

Prior to project site mobilization and the start of construction, the project owner shall provide a letter to the CPM and BLM acknowledging the requirements for construction lighting and documenting that lighting orders, installation, and operations will comply with this condition of certification for construction activity lighting.

Within 7 days after the first use of construction lighting, the project owner shall notify the CPM and BLM that the lighting is ready for inspection. If the CPM or BLM require modifications to the lighting, within 15 days of receiving that notification the project owner shall implement the necessary modifications and notify the CPM and BLM that the modifications have been completed.

At least 60 days prior to ordering any permanent exterior lighting, the project owner shall simultaneously submit a lighting management plan for permanent lighting to BLM and the CPM for review and approval. The project owner shall provide to the CPM a copy of the transmittal letter submitted to BLM requesting review of the plan. Comments received on the lighting management plan from BLM shall be provided to the CPM.

If BLM and/or the CPM determine that the plan requires revision, the project owner shall provide a revised plan for review and approval by BLM and the CPM. No work to implement the lighting management plan (e.g., purchasing or ordering fixtures) shall begin until final written approval is received from BLM and the CPM.

Prior to start of commercial operation, the project owner shall notify the CPM and BLM that installation of permanent exterior lighting has been completed and is ready for inspection. If after inspection BLM and/or the CPM notify the project owner that modifications to the lighting are needed, within 30 days after receiving the notification the project owner shall implement the modifications and notify the CPM and BLM when the modifications are completed and ready for inspection. The project owner shall obtain written confirmation from BLM and the CPM that the lighting system complies with the approved plan for the project.

Within 48 hours of receiving a project-related lighting complaint, the project owner shall provide a complaint resolution form to the CPM as specified in the Compliance General Conditions, including a proposal to resolve the complaint, and a schedule for implementing the proposed resolution. The project owner shall notify the CPM within 48 hours of resolving the complaint. A copy of the complaint resolution form report shall be submitted to the CPM within 30 calendar days. The project owner shall report any lighting complaints and document how complaints were resolved in the Annual Compliance Report for the project. All records of lighting complaints shall be kept in the on-site compliance file for the project.

SETBACK OF SUNCATCHERS FROM HIGHWAY I-40.

VIS-3 To reduce the visual dominance and glare effects of the SunCatchers to motorists on Highway I-40, the project owner shall set back the nearest units to a minimum distance of 223 feet from the edge of the roadway.

Verification: At least 30 days prior to start of Pre-Construction Site Mobilization, the project owner shall present to BLM and the CPM a revised plan depicting how the proposed SunCatchers will be set back from the highway. If BLM and/or the CPM determine that the plan requires revision, the project owner shall provide to the CPM a revised plan for review and approval by BLM and the CPM.

The project owner shall not begin construction until receiving BLM and CPM approval of the revised plan.

Appendix B
Calico Solar
Construction Emissions
(March 4, 2011 revision)

Calico Solar
Table B-1
Estimated Daily Maximum Construction Emissions of Criteria Pollutants (lbs/day)
(Month 7)

Activity	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_x
On-Site Construction Emissions						
On-Site Combustion Emissions						
Construction Equipment	15.39	14.17	218.26	42.65	276.10	0.28
Worker Vehicles	0.26	0.20	18.11	1.25	1.69	0.03
Security Vehicles	0.01	0.01	1.47	0.04	0.02	0.01
On-site generators	0.65	0.64	114.10	6.19	65.20	0.22
Bridge Construction Delivery Trucks	0.00	0.00	0.00	0.00	0.00	0.00
Other Delivery Trucks	1.68	1.50	14.47	5.32	27.20	0.03
Subtotal of On-site Combustion Emissions	**17.98**	**16.51**	**366.41**	**55.45**	**370.22**	**0.56**
On-Site Fugitive Emissions						
Construction Equipment	17.19	3.97				
Storage piles	9.53	2.12				
Worker Vehicles	55.43	8.31				
Security Vehicles	37.67	5.65				
On-site generators						
Bridge Construction Delivery Trucks	0.00	0.00				
Other Delivery Trucks	273.23	37.52				
Subtotal of On-Site Fugitive Emissions	**393.04**	**57.57**				
Subtotal of On-Site Emissions	**411.02**	**74.08**	**366.41**	**55.45**	**370.22**	**0.56**
Off-Site On-Road Emissions						
Off-Site Combustion Emissions						
Worker Vehicles	1.77	0.98	143.20	4.27	17.12	0.17
Bridge Construction Delivery Trucks	0.00	0.00	0.00	0.00	0.00	0.00
Other Delivery Trucks	4.25	3.62	23.30	5.10	115.73	0.12
Subtotal of Off-Site Combustion Emissions	**6.03**	**4.60**	**166.50**	**9.37**	**132.85**	**0.29**
Off-Site Paved Road Fugitive Dust Emissions						
Worker Vehicles	12.16	1.82				
Bridge Construction Delivery Trucks	0.00	0.00				
Other Delivery Trucks	17.70	2.66				
Subtotal of Off-Site Fugitive Emissions	**29.87**	**4.48**				
Subtotal of Off-Site Emissions	**35.89**	**9.08**	**166.50**	**9.37**	**132.85**	**0.29**
Total Maximum Daily Emissions	**446.92**	**83.16**	**532.91**	**64.82**	**503.07**	**0.85**

Calico Solar

Table B-2

Estimated Maximum Annual Construction Emissions of Criteria Pollutants (tons/year)

(Month 2 to 13)

Activity	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_x
On-Site Construction Emissions						
On-Site Combustion Emissions						
Construction Equipment	2.189	2.015	28.156	6.106	38.006	0.039
Worker Vehicles	0.034	0.026	2.398	0.165	0.224	0.003
Security Vehicles	0.001	0.001	0.229	0.006	0.003	0.001
On-site generators	0.102	0.099	17.799	0.966	10.171	0.034
Bridge Construction Delivery Trucks	0.000	0.000	0.000	0.000	0.000	0.000
Other Delivery Trucks	0.293	0.262	2.488	0.941	4.761	0.006
Subtotal of On-site Combustion Emissions	**2.62**	**2.40**	**51.07**	**8.18**	**53.17**	**0.08**
On-Site Fugitive Dust Emissions						
Construction Equipment	2.38	0.57				
Storage piles	0.87	0.19				
Worker Vehicles	7.34	1.10				
Security Vehicles	5.88	0.88				
On-site generators	-	-				
Bridge Construction Delivery Trucks	0.00	0.00				
Other Delivery Trucks	48.12	6.56				
Subtotal of On-Site Fugitive Emissions	**64.58**	**9.31**				
Subtotal of On-Site Emissions	**67.20**	**11.71**	**51.07**	**8.18**	**53.17**	**0.08**
Off-Site On-Road Emissions						
Off-Site Combustion Emissions						
Worker Vehicles	0.23	0.13	18.96	0.57	2.27	0.02
Bridge Construction Delivery Trucks	0.00	0.00	0.00	0.00	0.00	0.00
Other Delivery Trucks	0.61	0.52	3.32	0.73	16.51	0.02
Subtotal of Off-Site Combustion Emissions	**0.84**	**0.65**	**22.29**	**1.29**	**18.78**	**0.04**
Off-Site Paved Road Fugitive Emissions						
Worker Vehicles	1.61	0.24				
Bridge Construction Delivery Trucks	0.00	0.00				
Other Delivery Trucks	2.53	0.38				
Subtotal of Off-Site Fugitive Emissions	**4.14**	**0.62**				
Subtotal of Off-Site Emissions	**4.98**	**1.27**	**22.29**	**1.29**	**18.78**	**0.04**
Total Maximum Annual Emissions	**72.18**	**12.98**	**73.36**	**9.48**	**71.94**	**0.12**

Estimated Annual Maximum Construction Greenhouse Gases Emissions
(metric tonnes/year)
(Month 2 to 13)

Activity	CO_2	CH_4	N_2O	CO_2e
On-Site Construction Emissions				
On-Site Combustion Emissions				
Construction Equipment	3,271.20	0.78	-	3,287.57
Worker Vehicles	311.81	0.03	0.03	321.11
Security Vehicles	32.34	0.00	0.00	32.69
On-site generators	3,249.55	0.13	0.03	3,262.16
Bridge Construction Delivery Trucks	-	-	-	-
Other Delivery Trucks	550.04	0.00	0.00	551.48
Subtotal of On-site Combustion Emissions	**7,414.94**	**0.94**	**0.07**	**7,455.01**
On-Site Fugitive Dust Emissions				
Construction Equipment				
Storage piles				
Worker Vehicles				
Security Vehicles				
On-site generators				
Bridge Construction Delivery Trucks				
Other Delivery Trucks				
Subtotal of On-Site Fugitive Emissions				
Subtotal of On-Site Emissions	**7,414.94**	**0.94**	**0.07**	**7,455.01**
Off-Site On-Road Emissions				
Off-Site Combustion Emissions				
Worker Vehicles	1,952.80	0.47	0.43	2,096.16
Bridge Construction Delivery Trucks	-	-	-	-
Other Delivery Trucks	1,665.99	0.01	0.00	1,667.58
Subtotal of Off-Site Combustion Emissions	**3,618.79**	**0.47**	**0.44**	**3,763.74**
Off-Site Paved Road Fugitive Emissions				
Worker Vehicles				
Bridge Construction Delivery Trucks				
Other Delivery Trucks				
Subtotal of Off-Site Fugitive Emissions				
Subtotal of Off-Site Emissions	**3,618.79**	**0.47**	**0.44**	**3,763.74**
Total Maximum Annual Emissions	**11,033.73**	**1.42**	**0.50**	**11,218.74**

Note

1. For consistency to on-site emissions, month 7 was used to represent the daily/month and months 2-13 was used to represent the annual construction off-site (on-road) emissions.

Calico Solar

Table B-3
Estimated Entire Construction Period Emissions of GHG Pollutants (tons)

Activity	CO_2	CH_4	N_2O	CO_2e
On-Site Construction Emissions				
On-Site Combustion Emissions				
Construction Equipment	8554.17	2.20	0.00	8600.33
Worker Vehicles	933.06	0.091	0.084	960.889
Security Vehicles	121.818	0.006	0.004	123.110
On-site generators	12238.556	0.482	0.121	12286.064
All Delivery Trucks	1620.506	0.017	0.016	1625.720
Subtotal of On-site Combustion Emissions	**23468.11**	**2.79**	**0.22**	**23596.11**
On-Site Fugitive Dust Emissions				
Construction Equipment				
Worker Vehicles				
Security Vehicles				
All Delivery Trucks				
Subtotal of On-Site Fugitive Emissions				
Subtotal of On-Site Emissions	**23468.11**	**2.79**	**0.22**	**23596.11**
Off-Site On-Road Emissions				
Off-Site Combustion Emissions				
Worker Vehicles	5843.64	1.40	1.29	6272.63
All Delivery Trucks	7841.45	0.02	0.02	7848.94
Subtotal of Off-Site Combustion Emissions	**13685.10**	**1.43**	**1.31**	**14121.57**
Off-Site Paved Road Fugitive Emissions				
Worker Vehicles				
All Delivery Trucks				
Subtotal of Off-Site Fugitive Emissions				
Subtotal of Off-Site Emissions	**13685.10**	**1.43**	**1.31**	**14121.57**
Total Entire Construction Period Emissions	**37153.21**	**4.22**	**1.53**	**37717.69**

Table B-3 rev.

Estimated Entire Construction Period Greenhouse Gases Emissions
(metric tonnes)

Activity	CO_2	CH_4	N_2O	CO_2e
On-Site Construction Emissions				
On-Site Combustion Emissions				
Construction Equipment	7,760.21	1.99	-	7,802.09
Worker Vehicles	846.46	0.08	0.08	871.70
Security Vehicles	110.51	0.01	0.00	111.68
On-site generators	11,102.63	0.44	0.11	11,145.73
All Delivery Trucks	1,470.10	0.02	0.01	1,474.83
Subtotal of On-site Combustion Emissions	**21,289.91**	**2.53**	**0.20**	**21,406.03**
On-Site Fugitive Dust Emissions				
Construction Equipment				
Worker Vehicles				
Security Vehicles				
All Delivery Trucks				
Subtotal of On-Site Fugitive Emissions				
Subtotal of On-Site Emissions	**21,289.91**	**2.53**	**0.20**	**21,406.03**
Off-Site On-Road Emissions				
Off-Site Combustion Emissions				
Worker Vehicles	5,301.27	1.27	1.17	5,690.44
All Delivery Trucks	7,113.65	0.02	0.02	7,120.44
Subtotal of Off-Site Combustion Emissions	**12,414.91**	**1.29**	**1.19**	**12,810.88**
Off-Site Paved Road Fugitive Emissions				
Worker Vehicles				
All Delivery Trucks				
Subtotal of Off-Site Fugitive Emissions				
Subtotal of Off-Site Emissions	**12,414.91**	**1.29**	**1.19**	**12,810.88**
Total Entire Construction Period Emissions	**33,704.82**	**3.83**	**1.39**	**34,216.91**

Calico Solar

Temporary Portable Generator Emissions

Five 250kW diesel engines which are all registered in the State Portable Equipment Registration Program (PERP).

All portable engines will be expected to run for the entire construction phase. But each portable engine will be operated at one location up to 12 month to meet PERP requirement.

PERP DIESEL ENGINE

		Emission Factor (g/kW/hr)						Tier 3 Emissions			Interim Tier 4 Emissions		
Pollutant	Power rating (kW)	Tier 3	Interim Tier 4	hr/ day	actual utilization (hr/ day)	day/ month	month/ year	lb/hr	lb/day	ton/yr	lb/hr	lb/day	ton/yr
ROG	250	0.40	0.19	16	11.84	26	12	0.22	2.61	0.41	0.10	1.24	0.19
NOx	250	4.00	2.00	16	11.84	26	12	2.20	26.08	4.07	1.10	13.04	2.03
CO	250	3.50	3.50	16	11.84	26	12	1.93	22.82	3.56	1.93	22.82	3.56
PM10	250	0.20	0.02	16	11.84	26	12	0.11	1.30	0.20	0.01	0.13	0.02

Notes:

1. If no available specific VOC emission limit, it is assumed to be 10% of the NMHC+NOx emission standard; NOx emission limit is conservatively assumed to be the same as the NMHC+NOx emission standard;
2. 250kW engine will be complied with Interim Tier 4 standards based on the PERP's requirement.
3. Utilization Load Factor (0.74) from SCAQMD

Reference:

1. CARB offroad emission factor (http://www.arb.ca.gov/msprog/offroad/offroadci.pdf)
2. CARB PERP program (http://www.arb.ca.gov/portable/portable.htm)

Daily Emissions

Engine Quantity	Engine Fuel	Power rating (kW)	Emission Requirement	Emissions (lb/day) [for each engine]									
				PM10	PM2.5	CO	ROG	NOx	SOx	CO_2	CH_4	N_2O	CO_2e
5	Diesel	250.00	PERP - Interim Tier 4 Emissions	1.30E-01	1.27E-01	2.28E+01	1.24E+00	1.30E+01	4.34E-02	4.59E+03	1.81E-01	4.52E-02	4.61E+03
Total Engines				**6.52E-01**	**6.36E-01**	**1.14E+02**	**6.19E+00**	**6.52E+01**	**2.17E-01**	**2.30E+04**	**9.05E-01**	**2.26E-01**	**2.31E+04**

Annual Emissions

Engine Quantity	Engine Fuel	Power rating (kW)	Emission Requirement	Emissions (ton/yr) [for each engine]									
				PM10	PM2.5	CO	ROG	NOx	SOx	CO_2	CH_4	N_2O	CO_2e
5	Diesel	250.00	PERP - Interim Tier 4 Emissions	2.03E-02	1.99E-02	3.56E+00	1.93E-01	2.03E+00	6.77E-03	7.16E+02	2.82E-02	7.06E-03	7.19E+02
Total Engines				**1.02E-01**	**9.93E-02**	**1.78E+01**	**9.66E-01**	**1.02E+01**	**3.39E-02**	**3.58E+03**	**1.41E-01**	**3.53E-02**	**3.60E+03**

Notes:

1. PM2.5 emission factors determined using guidance from SCAQMD Final - Methodology to Calculate PM2.5 and PM2.5 Significance Thresholds 10/1/2006, Appendix A - Updated CEIDARS Table with PM2.5 Fractions
2. Fuel usage information (from Risk Management Guidance for the Permitting of New Stationary Diesel-Fueled Engines, CARB October 2000):
   - 250kW engine: 17.33 gallon/hr max.
3. 15 ppm low sulfer fuel will be used to the engines.
4. Fuel density from EPA AP-42.
5. Greenhouse gas emission factors from CCAR General Reporting Protocol V3.1 January 2009 Tables C.7 and C.9
6. Greenhouse Gas Global Warming Potential (GWP) - Intergovernmental Panel on Climate Change, Second Assessment Report (1996)
   - CO_2 GWP (SAR, 1996) = 1
   - CH_4 GWP (SAR, 1996) = 21
   - N_2O GWP (SAR, 1996) = 310

Calico Solar
Construction Equipment Projection (PV and Suncatchers)

Construction Equipment Description	HP	D	G	P	Month After Construction Start (number of equipment per day)																																													
					1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
Air Compressor	50	X			1	1	1	1	1	1	1	3	3	2	2	2	2	2	2	2	2	1	1						1	1	1	1	1												
Asphalt Paver	120	X				1																								1															
Backhoe	120	X			3	5	5	5	5	6	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	6	6	6	6	2	2	1										
Compactor	120	X			2	3	3	3	3	3	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	6	6	6	6	3	2	1										
Crane small (Hydraulic Vibrating Post Driver and Stickboom Crane)	175	X			5	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	3	3	3	3	3	3	3	3	1	1	1	1	1
Crane large	500	X			1	1	1	2	2	2	3	1													1	1	1	1	1	1	1	1													
Dozer	250	X			1	1	1	1	1	1	1	1	1	1				1	1	1	1								1	1	1	1	1												
Generator	50	X			1	1	1	1	1	2	3	2	5	5	5	5	5	3	3	3	3	3	2	2	2	2	2	1	1	1	1	1	1												
Grader	175	X			2	2	1	1	1	1	1	1	1	1				1	2	1	1								1	1	1	1	1												
Light Tower	50	X						1	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1																			
Loader	250	X			2	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	3	3	3	3	3	1							
Maxi Sneeker (Trencher)	50	X			2	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	2	2	1										
Skid Steer (Bobcat)	50	X			2	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	2	2	1										
Welding Machine	50	X				1	2	3	5	5	5	5	5	5	5	5	3	3	3	3	2	1	1	1	0																				
Equipment fueled with Propane																																																		
Aerial Lift	120			X	2	6	6	6	6	6	6	6	3	3	2	2	2	5	6	6	6	6	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	6	6	6	6	6	6	6
Fork Lift	50			X	2	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	4	4	4											
Telehandler	120			X			1	1	2	6	5	5	3	3	3	3	3	5	8	6	5	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Vehicles with Onroad Engines for Emissions Estimates																																																		
Concrete Delivery Truck for general construction	250	X			2	6	6																																											
Concrete Delivery Truck for bridge	250	X																											1	1	1	1	1	3	1												
Concrete Pump Truck for bridge	250	X																											1	1	1	1	1	1	1												
Dump Truck	250	X			3	7	7	6	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	6	6	6	5	2	2	1											
Flatbed Truck	250	X			2	9	9	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	11	11	10	7	7	7	7	7	7	7	7	2	2	2	2	2
Staff & Security Truck	187	/			6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Pickup Truck	175		X		11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Water and Road Preparation Materials Truck	250	X			5	12	8	8	7	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	3	3	4	4	3	3	1	1	1	1	1	1	1	1	1	1	1	1	1
General Materials Delivery Truck for general construction	250	X				3	3	3	3	3	3	3	3																																
General Materials Delivery Truck for bridge	250	X																											2	2	2	2	6	6	2										
Steel Piling Delivery Truck	250	X						3	3	3	3	1													3	3	3	3	3																
PV Panels Delivery Truck	250	X			6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Tracker Steel Delivery Truck	250	X			8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Suncatcher Delivery Truck	250	X																																21	21	21	21	21	21	21	21	21	21	21	21
Electrical and Control Systems Delivery Truck	250	X			2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Tracker Delivery Truck	250	X			2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Water Delivery Trucks	450	X																																											
Worker Passenger Vehicles	100	/			67	180	249	219	219	320	340	330	334	305	305	305	357	341	347	332	325	280	247	226	209	208	208	208	208	208	208	166	166	166	166	166	190	190	190	153	153	153	153	152	152
Total					140	315	380	350	352	457	479	466	466	433	430	430	480	469	480	462	453	401	363	341	327	326	323	322	333	332	330	286	247	265	254	241	265	263	266	229	222	222	222	221	221

Note:

1. abbreviation:
   HP=horsepower
   G=gasoline
   D=diesel
   P=propane
2. max numbers of equipment and vehicles per month = 480

Calico Solar

Description	Activity	Make / Model	Fuel	Quantity per day per month	Frequency	Horse-power	Vehicle Weight (tons)	Max Daily Onsite Distance per Vehicle (mile/day)	Assumed distance percentage to drive on onsite sealed roads	Assumed distance percentage to drive on onsite unpaved roads	Assumed distance percentage to drive on onsite paved roads	Max Daily Offsite Round-trip Distance per Vehicle within MDAQMD jurisdictional area (mile/day)	Offsite Travel to and from	Onsite Travel description
Concrete Delivery Truck for general construction			Diesel	variable - from construction equipment schedule	Daily	250	20	4.4	0%	0%	100%	74	Barstow	most concrete will be delivered to the MSC area
Concrete Delivery Truck for bridge			Diesel	variable - from construction equipment schedule	Daily	250	20	4	0%	0%	100%	74	Barstow	most concrete will be delivered to the bridge construction area
Concrete Pump Truck for bridge			Diesel	variable - from construction equipment schedule	Daily	250	20	4.4	0%	0%	100%	0	on-site only	concrete pump will be used mostly in the MSC area
Dump Truck			Diesel	variable - from construction equipment schedule	Daily	250	20	8.1	40%	10%	50%	0	on-site only	from the MSC area to the any construction area of the site
Flatbed Truck			Diesel	variable - from construction equipment schedule	Daily	250	10	16.2	40%	10%	50%	0	on-site only	delivers materials to installation location
Staff & Security Truck	Site Inspections & Security	Toyota Highlander or similar	Gasoline - Hybrid	6	Daily	187	2.25	53	100%	0%	0%	0	on-site only	travels mainly perimeter and main access road
Pickup Truck			Gasoline	variable - from construction equipment schedule	Daily	175	4	16.2	40%	10%	50%	0	on-site only	from the MSC area to the any construction area of the site
Water and Road Preparation Materials Truck			Diesel	variable - from construction equipment schedule	Daily	250	20	48	30%	60%	10%	0	on-site only	from the MSC area to the any construction area of the site
General Materials Delivery Truck for general construction	General Construction Materials	transport truck	Diesel	variable - from construction equipment schedule	Daily	250	20	4.4	0%	0%	100%	74	Barstow	most materials will be delivered to the MSC area
General Materials Delivery Truck for bridge	General Construction Materials	transport truck	Diesel	variable - from construction equipment schedule	Daily	250	20	4	0%	0%	100%	74	Barstow	most materials will be delivered to the bridge construction area
PV/Suncatcher Delivery Trucks	Steel Piling Delivery Truck	transport truck	Diesel	variable - from construction equipment schedule	Daily	250	20	4.4	0%	0%	100%	156	LA area	most materials will be delivered to the MSC area
	PV Panels Delivery Truck	transport truck	Diesel	6	Daily	250	20	4.4	0%	0%	100%	156	LA area	most materials will be delivered to the MSC area
	Tracker Steel Delivery Truck	transport truck	Diesel	11	Daily	250	20	4.4	0%	0%	100%	156	LA area	most materials will be delivered to the MSC area
	Suncatcher Delivery Truck	transport truck	Diesel	7	Daily	250	20	4.4	0%	0%	100%	156	LA area	most materials will be delivered to the MSC area
	Electrical and Control Systems Delivery Truck	transport truck	Diesel	2	Daily	250	20	4.4	0%	0%	100%	156	LA area	most materials will be delivered to the MSC area
	Tracker Delivery Truck	transport truck	Diesel	2	Daily	250	20	4.4	0%	0%	100%	156	LA area	most materials will be delivered to the MSC area
Water Delivery Trucks	water will be provided by onsite ground water well	3700 gal truck	Diesel	0	Daily	300	0		0%	0%	100%	0		
Worker Passenger Vehicles	Community to Work	Passenger vehicles	Gasoline & diesel	variable - from construction equipment schedule	Daily	100	2	4.8	10%	0%	90%	74	Barstow	to the main laydown area

Note:

1. Vehicles with variable quantities, the quantity per month can be found in Revised Construction Equipment and Vehicles Projection.
2. The average distance from the Project site entrance to bridge construction area, MSC, and the main laydown area is about 2, 2.2, and 2.4 miles, one-way, respectively.
3. The average distance between the MSC and the main laydown area is about 0.2 miles.
4. The fenceline perimeter is approximately 30 miles. Each security vehicle is assumed to travel from the MSC to the site entrance (2.2 miles), and around the perimeter plus one trip to the center of north fenced property (3.4 miles) and the center of southwest fenced property (4.7 miles) and back (and plus additional 10% for misc trips) = approximately 53 miles.
5. Average distance from main service complex to center of north and southwest portion of the site is 3.4 and 4.7 miles, respectively. Thus, the average round trip distance for each dump truck travels is 8.1 [=(3.4+4.7)/2*2] miles.
6. The water delivery truck will not be used in this project since the project is going to use the on-site water.
7. The distance from the Project site to Barstow is about 37 miles.
8. The distance from the Project site to the edge of the MDAQMD jurisdictional area toward Los Angeles is about 78 miles.
9. On-site travelling:

   Delivery Trucks: mostly from the Project site entrance to the MSC (2.2 miles).

   Worker Passenger Vehicles: from the Project site entrance to the laydown area in the MSC (2.4 miles).

   Flatbed Truck and Pick-up Truck: assumed to make 1 round trips per day to the center of north and southwest fenced properties to the PV/SunCatcher installation locations delivering assembled material and misc parts.

   Estimated the daily maximum driving distance is 48 miles for Water Trucks.

   Construction laydown area is sealed
10. There are three kinds of roads. The first is the main plant access road, which is an asphalt paved road. The second type is a dirt road, sealed with Solitac or equivalent. Most of the roads on site are of this type. The roads between suncatcher rows are of this type. The third type is not a road at all, but rather an unimproved access path between the rows of PV panels. These paths remain entirely unimproved.
11. All diesel equipment drive on unpaved road.
12. All Propane equipment drive 50% on sealed road and 50% on unpaved road.

Calico Solar
Combustion Exhaust Emissions On-site (short-term)
Highest emissions occur in month 7.

construction schedule = 12 hours per day 7 am to 7 pm
actual working hour = 10 hours per day 7 am to 7 pm
delivery trucks can arrive at the site anytime during the day or night
all workers take 1 hour lunch and two 30 minute breaks.

pedestal installation = 16 hours per day
actual pedestal installation hours = 14 hours per day

EMISSION FACTORS

				Emission factors (ton/hr)											Emission rate per piece of equipment (lb/hr)									
Equipment	**Load Factor**	**Hours/Day**	**Horsepower**	**PM_{10}**	**$PM_{2.5}$**	**CO**	**ROG**	**NO_x**	**SO_2**	**CO_2**	**CH_4**	**N_2O**	**CO_2e**	**PM_{10}**	**$PM_{2.5}$**	**CO**	**ROG**	**NO_x**	**SO_2**	**CO_2**	**CH_4**	**N_2O**	**CO_2e**
Diesel Construction Equipment																							
Air Compressor	0.48	5	50	1.33E-05	1.23E-05	1.42E-04	5.88E-05	1.20E-04	1.44E-07	1.11E-02	5.31E-06	0.00E+00	1.12E-02	2.67E-02	2.46E-02	2.83E-01	1.18E-01	2.39E-01	2.88E-04	2.23E+01	1.06E-02	0.00E+00	2.25E+01
Asphalt Paver	0.59	6	120	4.26E-05	3.92E-05	2.61E-04	8.18E-05	4.84E-04	4.05E-07	3.46E-02	7.38E-06	0.00E+00	3.47E-02	8.52E-02	7.84E-02	5.22E-01	1.64E-01	9.68E-01	8.11E-04	6.91E+01	1.48E-02	0.00E+00	6.94E+01
Backhoe	0.47	5	120	2.57E-05	2.37E-05	1.81E-04	4.54E-05	2.83E-04	3.03E-07	2.58E-02	4.10E-06	0.00E+00	2.59E-02	5.14E-02	4.73E-02	3.62E-01	9.08E-02	5.66E-01	6.06E-04	5.17E+01	8.19E-03	0.00E+00	5.19E+01
Compactor	0.47	5	120	3.20E-05	2.95E-05	2.09E-04	6.00E-05	3.69E-04	3.46E-07	2.95E-02	5.41E-06	0.00E+00	2.96E-02	6.41E-02	5.89E-02	4.17E-01	1.20E-01	7.38E-01	6.91E-04	5.89E+01	1.08E-02	0.00E+00	5.92E+01
Crane small (Hydraulic Vibrating Post Driver and	0.43	4	175	2.69E-05	2.47E-05	2.44E-04	6.05E-05	4.65E-04	4.52E-07	4.01E-02	5.46E-06	0.00E+00	4.03E-02	5.38E-02	4.95E-02	4.88E-01	1.21E-01	9.29E-01	9.03E-04	8.03E+01	1.09E-02	0.00E+00	8.05E+01
Crane large	0.43	6	500	3.42E-05	3.15E-05	3.31E-04	9.10E-05	8.85E-04	8.83E-07	9.00E-02	8.21E-06	0.00E+00	9.01E-02	6.85E-02	6.30E-02	6.62E-01	1.82E-01	1.77E+00	1.77E-03	1.80E+02	1.64E-02	0.00E+00	1.80E+02
Dozer	0.59	6	250	3.92E-05	3.61E-05	2.87E-04	1.03E-04	9.71E-04	9.34E-07	8.30E-02	9.25E-06	0.00E+00	8.32E-02	7.84E-02	7.21E-02	5.74E-01	2.05E-01	1.94E+00	1.87E-03	1.66E+02	1.85E-02	0.00E+00	1.66E+02
Generator	0.74	7	50	1.43E-05	1.32E-05	1.46E-04	5.65E-05	1.54E-04	1.98E-07	1.53E-02	5.10E-06	0.00E+00	1.54E-02	2.86E-02	2.63E-02	2.92E-01	1.13E-01	3.07E-01	3.96E-04	3.06E+01	1.02E-02	0.00E+00	3.08E+01
Grader	0.58	6	175	3.91E-05	3.60E-05	3.70E-04	8.70E-05	6.76E-04	6.97E-07	6.19E-02	7.85E-06	0.00E+00	6.21E-02	7.82E-02	7.19E-02	7.40E-01	1.74E-01	1.35E+00	1.39E-03	1.24E+02	1.57E-02	0.00E+00	1.24E+02
Light Tower	0.62	6	50	1.31E-05	1.21E-05	1.46E-04	5.16E-05	1.39E-04	1.81E-07	1.40E-02	4.66E-06	0.00E+00	1.41E-02	2.63E-02	2.42E-02	2.93E-01	1.03E-01	2.78E-01	3.62E-04	2.80E+01	9.31E-03	0.00E+00	2.82E+01
Loader	0.54	5	250	2.81E-05	2.59E-05	2.10E-04	7.46E-05	7.67E-04	8.37E-07	7.44E-02	6.73E-06	0.00E+00	7.46E-02	5.63E-02	5.18E-02	4.21E-01	1.49E-01	1.53E+00	1.67E-03	1.49E+02	1.35E-02	0.00E+00	1.49E+02
Maxi Sneeker (Trencher)	0.70	7	50	2.02E-05	1.86E-05	2.18E-04	9.18E-05	1.81E-04	2.13E-07	1.64E-02	8.28E-06	0.00E+00	1.66E-02	4.05E-02	3.72E-02	4.36E-01	1.84E-01	3.62E-01	4.25E-04	3.29E+01	1.66E-02	0.00E+00	3.32E+01
Skid Steer (Bobcat)	0.62	6	50	1.08E-05	9.96E-06	1.25E-04	3.92E-05	1.23E-04	1.65E-07	1.27E-02	3.54E-06	0.00E+00	1.28E-02	2.17E-02	1.99E-02	2.50E-01	7.84E-02	2.46E-01	3.30E-04	2.55E+01	7.07E-03	0.00E+00	2.56E+01
Welding Machine	0.45	5	50	1.45E-05	1.33E-05	1.52E-04	6.22E-05	1.36E-04	1.68E-07	1.30E-02	5.62E-06	0.00E+00	1.31E-02	2.90E-02	2.67E-02	3.04E-01	1.24E-01	2.73E-01	3.35E-04	2.59E+01	1.12E-02	0.00E+00	2.62E+01
Equipment fueled with Propane								**Emission factors (ton/hr)**															
Aerial Lift	0.51	5	120	1.39E-06	1.39E-06	7.09E-04	2.48E-06	1.02E-04	0.00E+00	1.56E-02	2.08E-05	0.00E+00	1.61E-02	2.78E-03	2.78E-03	1.42E+00	4.95E-03	2.03E-01	0.00E+00	3.12E+01	4.15E-02	0.00E+00	3.21E+01
Fork Lift	0.30	3	50	8.14E-07	8.14E-07	1.48E-04	1.41E-06	6.05E-05	0.00E+00	9.15E-03	1.18E-05	0.00E+00	9.40E-03	1.63E-03	1.63E-03	2.95E-01	2.82E-03	1.21E-01	0.00E+00	1.83E+01	2.36E-02	0.00E+00	1.88E+01
Telehandler	0.51	5	120	1.39E-06	1.39E-06	7.09E-04	2.48E-06	1.02E-04	0.00E+00	1.56E-02	2.08E-05	0.00E+00	1.61E-02	2.78E-03	2.78E-03	1.42E+00	4.95E-03	2.03E-01	0.00E+00	3.12E+01	4.15E-02	0.00E+00	3.21E+01
Vehicles with Onroad Engines for Emissions Estimates	Onsite Miles per Day Travelled per Vehicle	**Hours/Day**	**Vehicle Weight (lbs)**					**Emission factors (g/mile)**															
Concrete Delivery Truck for general construction	4.4	12	40,000	1.69E+00	1.52E+00	1.25E+01	5.91E+00	2.79E+01	3.00E-02	3.17E+03	5.10E-03	4.80E-03	3.17E+03	1.37E-03	1.23E-03	1.01E-02	4.77E-03	2.25E-02	2.42E-05	2.56E+00	4.12E-06	3.88E-06	2.56E+00
Concrete Delivery Truck for bridge	4	12	40,000	1.69E+00	1.52E+00	1.25E+01	5.91E+00	2.79E+01	3.00E-02	3.17E+03	5.10E-03	4.80E-03	3.17E+03	1.24E-03	1.12E-03	9.17E-03	4.34E-03	2.05E-02	2.20E-05	2.32E+00	3.74E-06	3.52E-06	2.33E+00
Concrete Pump Truck for bridge	4.4	12	40,000	1.69E+00	1.52E+00	1.25E+01	5.91E+00	2.79E+01	3.00E-02	3.17E+03	5.10E-03	4.80E-03	3.17E+03	1.37E-03	1.23E-03	1.01E-02	4.77E-03	2.25E-02	2.42E-05	2.56E+00	4.12E-06	3.88E-06	2.56E+00
Dump Truck	8.1	12	40,000	1.69E+00	1.52E+00	1.25E+01	5.91E+00	2.79E+01	3.00E-02	3.17E+03	5.10E-03	4.80E-03	3.17E+03	2.52E-03	2.26E-03	1.86E-02	8.78E-03	4.14E-02	4.46E-05	4.71E+00	7.58E-06	7.14E-06	4.71E+00
Flatbed Truck	16.2	12	20,000	5.80E-01	5.19E-01	5.22E+00	4.53E-01	9.31E+00	1.40E-02	1.51E+03	1.10E-03	1.70E-03	1.51E+03	1.72E-03	1.54E-03	1.55E-02	1.35E-03	2.77E-02	4.16E-05	4.48E+00	3.27E-06	5.06E-06	4.48E+00
Staff & Security Truck	53	24	4,500	1.00E-02	1.00E-02	2.10E+00	5.50E-02	3.00E-02	9.00E-03	3.26E+02	1.57E-02	1.01E-02	3.30E+02	4.86E-05	4.86E-05	1.02E-02	2.68E-04	1.46E-04	4.38E-05	1.59E+00	7.64E-05	4.91E-05	1.60E+00
Pickup Truck	16.2	12	8,000	7.20E-02	5.47E-02	5.04E+00	3.47E-01	4.70E-01	7.00E-03	7.22E+02	7.04E-02	6.47E-02	7.44E+02	2.14E-04	1.63E-04	1.50E-02	1.03E-03	1.40E-03	2.08E-05	2.15E+00	2.09E-04	1.92E-04	2.21E+00
Water and Road Preparation Materials Truck	48	12	40,000	1.69E+00	1.52E+00	1.25E+01	5.91E+00	2.79E+01	3.00E-02	3.17E+03	5.10E-03	4.80E-03	3.17E+03	1.49E-02	1.34E-02	1.10E-01	5.20E-02	2.46E-01	2.64E-04	2.79E+01	4.49E-05	4.23E-05	2.79E+01
General Materials Delivery Truck for general cons	4.4	24	40,000	1.69E+00	1.52E+00	1.25E+01	5.91E+00	2.79E+01	3.00E-02	3.17E+03	5.10E-03	4.80E-03	3.17E+03	6.84E-04	6.14E-04	5.05E-03	2.38E-03	1.13E-02	1.21E-05	1.28E+00	2.06E-06	1.94E-06	1.28E+00
General Materials Delivery Truck for bridge	4	24	40,000	1.69E+00	1.52E+00	1.25E+01	5.91E+00	2.79E+01	3.00E-02	3.17E+03	5.10E-03	4.80E-03	3.17E+03	6.22E-04	5.58E-04	4.59E-03	2.17E-03	1.02E-02	1.10E-05	1.16E+00	1.87E-06	1.76E-06	1.16E+00
Steel Piling Delivery Truck	4.4	24	40,000	1.69E+00	1.52E+00	1.25E+01	5.91E+00	2.79E+01	3.00E-02	3.17E+03	5.10E-03	4.80E-03	3.17E+03	6.84E-04	6.14E-04	5.05E-03	2.38E-03	1.13E-02	1.21E-05	1.28E+00	2.06E-06	1.94E-06	1.28E+00
PV Panels Delivery Truck	4.4	24	40,000	1.69E+00	1.52E+00	1.25E+01	5.91E+00	2.79E+01	3.00E-02	3.17E+03	5.10E-03	4.80E-03	3.17E+03	6.84E-04	6.14E-04	5.05E-03	2.38E-03	1.13E-02	1.21E-05	1.28E+00	2.06E-06	1.94E-06	1.28E+00
Tracker Steel Delivery Truck	4.4	24	40,000	1.69E+00	1.52E+00	1.25E+01	5.91E+00	2.79E+01	3.00E-02	3.17E+03	5.10E-03	4.80E-03	3.17E+03	6.84E-04	6.14E-04	5.05E-03	2.38E-03	1.13E-02	1.21E-05	1.28E+00	2.06E-06	1.94E-06	1.28E+00
Suncatcher Delivery Truck	4.4	24	40,000	1.69E+00	1.52E+00	1.25E+01	5.91E+00	2.79E+01	3.00E-02	3.17E+03	5.10E-03	4.80E-03	3.17E+03	6.84E-04	6.14E-04	5.05E-03	2.38E-03	1.13E-02	1.21E-05	1.28E+00	2.06E-06	1.94E-06	1.28E+00
Electrical and Control Systems Delivery Truck	4.4	24	40,000	1.69E+00	1.52E+00	1.25E+01	5.91E+00	2.79E+01	3.00E-02	3.17E+03	5.10E-03	4.80E-03	3.17E+03	6.84E-04	6.14E-04	5.05E-03	2.38E-03	1.13E-02	1.21E-05	1.28E+00	2.06E-06	1.94E-06	1.28E+00
Tracker Delivery Truck	4.4	24	40,000	1.69E+00	1.52E+00	1.25E+01	5.91E+00	2.79E+01	3.00E-02	3.17E+03	5.10E-03	4.80E-03	3.17E+03	6.84E-04	6.14E-04	5.05E-03	2.38E-03	1.13E-02	1.21E-05	1.28E+00	2.06E-06	1.94E-06	1.28E+00
Water Delivery Trucks	0	24	-	5.80E-01	5.19E-01	5.22E+00	4.53E-01	9.31E+00	1.40E-02	1.51E+03	1.10E-03	1.70E-03	1.51E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Worker Passenger Vehicles	4.8	24	4,000	7.20E-02	5.47E-02	5.04E+00	3.47E-01	4.70E-01	7.00E-03	7.22E+02	7.04E-02	6.47E-02	3.30E+02	3.17E-05	2.41E-05	2.22E-03	1.53E-04	2.07E-04	3.08E-06	3.18E-01	3.10E-05	2.85E-05	3.28E-01

Notes:

1. Emission factors from CARB Off-road Mobile Source Emission Factors (2006-2020) for diesel and propane equipment. (2009 data used).
   Dozer = Crawler Tractor
   Loader = Rubber Tired Loader
   Backhoe = Tractors/Loaders/Backhoes
   Light Tower = Other Construction Equipment
2. Utilization Load Factors from SCAQMD
3. $PM_{2.5}$ emission factors obtained by multiplying the PM_{10} emissions by $PM_{2.5}$ fraction in SCAQMD CEIDARS list for onroad or offroad diesel vehicles.
4. For propane equipment assumed $PM_{2.5}$ and PM_{10} Fraction of total PM is 1.000
5. Onroad vehicle emissions from EMFAC2007 model. The vehicle description in EMFAC2007 model are as follows:
   - Flatbed Truck and Water Delivery Truck are Medium-Heavy-Duty (MHD-DSL).
   - Staff & Security Truck (gasoline) is Light-Heavy-Duty (LDT2-CAT)
   - Worker Passenger Vehicle and Pickup Truck are Passenger Car (LDA-ALL)
   - Concrete Delivery Truck, Concrete Pump Truck, Dump Truck, Water/Soiltac Truck, General Materials Delivery Trucks, Suncatcher Pedestals Delivery Truck, Stirling Engines Delivery Truck, Suncatcher Metal Supports Delivery Truck, Suncatcher Mirrors Delivery Truck, Electrical and Control Systems Delivery Truck, and Azimuth & Elevation Drive Delivery Truck are all Heavy-Heavy-Duty (HHD-DSL)
6. The emissions of "Toyota Highlander Hybrid" (Staff & Security Truck) meet the Tier 2/Bin 3 Federal emissions standard (reference source 3) and its performance is 27 mile/gallon in city (from Toyota website)
7. SO_2 emission factors for the Toyota Highlander Hybrid are from EMFAC2007- Light-Duty Trucks (LDT2-CAT).
8. CH_4 and N_2O emission factors for the running vehicles are from Reference source 1: Table C.4, California Climate Action Registry General Reporting Protocol Version 3.1, January 2009. Hybrid Truck is assumed to be gasoline light truck here.
9. Greenhouse Gas Global Warming Potential (GWP) - Intergovernmental Panel on Climate Change, Second Assessment Report (1996)
   CO_2 GWP (SAR, 1996) = 1
   CH_4 GWP (SAR, 1996) = 21
   N_2O GWP (SAR, 1996) = 310

MONTHLY EMISSIONS (month 1-20)

	Month 1 Daily Emissions (lb/day)										
	Quantity Mo 1	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e
Diesel Construction Equipment											
Air Compressor	1.00	0.13	0.12	1.36	0.56	1.15	0.00	106.81	0.05	-	107.88
Asphalt Paver	-	-	-	-	-	-	-	-	-	-	-
Backhoe	3.00	0.73	0.67	5.10	1.28	7.98	0.01	728.71	0.12	-	731.14
Compactor	2.00	0.60	0.55	3.92	1.13	6.93	0.01	554.00	0.10	-	556.13
Crane small (Hydraulic Vibrating Post Driver and	5.00	1.16	1.06	10.48	2.60	19.98	0.02	1,725.86	0.23	-	1,730.78
Crane large	1.00	0.41	0.38	3.99	1.10	10.66	0.01	1,083.24	0.10	-	1,085.31
Dozer	1.00	0.46	0.43	3.39	1.21	11.46	0.01	979.30	0.11	-	981.59
Generator	1.00	0.21	0.19	2.16	0.84	2.27	0.00	226.41	0.08	-	227.99
Grader	2.00	0.91	0.83	8.59	2.02	15.68	0.02	1,436.20	0.18	-	1,440.03
Light Tower	-	-	-	-	-	-	-	-	-	-	-
Loader	2.00	0.61	0.56	4.54	1.61	16.57	0.02	1,607.50	0.15	-	1,610.56
Maxi Sneeker (Trencher)	2.00	0.57	0.52	6.11	2.57	5.06	0.01	460.44	0.23	-	465.30
Skid Steer (Bobcat)	2.00	0.27	0.25	3.10	0.97	3.05	0.00	316.15	0.09	-	317.99
Welding Machine	-	-	-	-	-	-	-	-	-	-	-
Equipment fueled with Propane											
Aerial Lift	2.00	0.03	0.03	14.45	0.05	2.07	-	318.59	0.42	-	327.49
Fork Lift	2.00	0.01	0.01	1.77	0.02	0.73	-	109.77	0.14	-	112.74
Telehandler	-	-	-	-	-	-	-	-	-	-	-
Vehicles with Onroad Engines for Emissions Estimates											
Concrete Delivery Truck for general construction	2.00	0.03	0.03	0.24	0.11	0.54	0.00	61.36	0.00	0.00	61.39
Concrete Delivery Truck for bridge	-	-	-	-	-	-	-	-	-	-	-
Concrete Pump Truck for bridge	-	-	-	-	-	-	-	-	-	-	-
Dump Truck	3.00	0.09	0.08	0.67	0.32	1.49	0.00	169.43	0.00	0.00	169.51
Flatbed Truck	2.00	0.04	0.04	0.37	0.03	0.66	0.00	107.41	0.00	0.00	107.44
Staff & Security Truck	6.00	0.01	0.01	1.47	0.04	0.02	0.01	228.55	0.01	0.01	230.98
Pickup Truck	11.00	0.03	0.02	1.98	0.14	0.18	0.00	283.44	0.03	0.03	291.89
Water and Road Preparation Materials Truck	5.00	0.90	0.80	6.61	3.12	14.73	0.02	1,673.36	0.00	0.00	1,674.21
General Materials Delivery Truck for general cons	-	-	-	-	-	-	-	-	-	-	-
General Materials Delivery Truck for bridge	-	-	-	-	-	-	-	-	-	-	-
Steel Piling Delivery Truck	-	-	-	-	-	-	-	-	-	-	-
PV Panels Delivery Truck	6.00	0.10	0.09	0.73	0.34	1.62	0.00	184.07	0.00	0.00	184.16
Tracker Steel Delivery Truck	8.00	0.13	0.12	0.97	0.46	2.16	0.00	245.43	0.00	0.00	245.55
Suncatcher Delivery Truck	-	-	-	-	-	-	-	-	-	-	-
Electrical and Control Systems Delivery Truck	2.00	0.03	0.03	0.24	0.11	0.54	0.00	61.36	0.00	0.00	61.39
Tracker Delivery Truck	2.00	0.03	0.03	0.24	0.11	0.54	0.00	61.36	0.00	0.00	61.39
Water Delivery Trucks	-	-	-	-	-	-	-	-	-	-	-
Worker Passenger Vehicles	67.00	0.05	0.04	3.57	0.25	0.33	0.00	511.53	0.05	0.05	526.78
Total	**140.00**	**7.53**	**6.89**	**86.05**	**20.99**	**126.41**	**0.14**	**13,240.25**	**2.09**	**0.08**	**13,309.63**

	Month 2 Daily Emissions (lb/day)										
	Quantity Mo 2	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e
Diesel Construction Equipment											
Air Compressor	1.00	0.13	0.12	1.36	0.56	1.15	0.00	106.81	0.05	-	107.88
Asphalt Paver	1.00	0.50	0.46	3.08	0.97	5.71	0.00	407.89	0.09	-	409.72
Backhoe	5.00	1.21	1.11	8.51	2.13	13.29	0.01	1,214.52	0.19	-	1,218.56
Compactor	3.00	0.90	0.83	5.88	1.69	10.40	0.01	830.99	0.15	-	834.20
Crane small (Hydraulic Vibrating Post Driver and	15.00	3.47	3.19	31.44	7.80	59.93	0.06	5,177.57	0.70	-	5,192.35
Crane large	1.00	0.41	0.38	3.99	1.10	10.66	0.01	1,083.24	0.10	-	1,085.31
Dozer	1.00	0.46	0.43	3.39	1.21	11.46	0.01	979.30	0.11	-	981.59
Generator	1.00	0.21	0.19	2.16	0.84	2.27	0.00	226.41	0.08	-	227.99
Grader	2.00	0.91	0.83	8.59	2.02	15.68	0.02	1,436.20	0.18	-	1,440.03
Light Tower	-	-	-	-	-	-	-	-	-	-	-
Loader	10.00	3.04	2.80	22.72	8.06	82.83	0.09	8,037.52	0.73	-	8,052.79
Maxi Sneeker (Trencher)	5.00	1.42	1.30	15.26	6.42	12.66	0.01	1,151.09	0.58	-	1,163.26
Skid Steer (Bobcat)	5.00	0.67	0.62	7.76	2.43	7.63	0.01	790.38	0.22	-	794.99
Welding Machine	1.00	0.13	0.12	1.37	0.56	1.23	0.00	116.71	0.05	-	117.77
Equipment fueled with Propane											
Aerial Lift	6.00	0.09	0.09	43.36	0.15	6.22	-	955.78	1.27	-	982.47
Fork Lift	6.00	0.03	0.03	5.31	0.05	2.18	-	329.30	0.43	-	338.23
Telehandler	-	-	-	-	-	-	-	-	-	-	-
Vehicles with Onroad Engines for Emissions Estimates											
Concrete Delivery Truck for general construction	6.00	0.10	0.09	0.73	0.34	1.62	0.00	184.07	0.00	0.00	184.16
Concrete Delivery Truck for bridge	-	-	-	-	-	-	-	-	-	-	-
Concrete Pump Truck for bridge	-	-	-	-	-	-	-	-	-	-	-
Dump Truck	7.00	0.21	0.19	1.56	0.74	3.48	0.00	395.33	0.00	0.00	395.53
Flatbed Truck	9.00	0.19	0.17	1.68	0.15	2.99	0.00	483.32	0.00	0.00	483.50
Staff & Security Truck	6.00	0.01	0.01	1.47	0.04	0.02	0.01	228.55	0.01	0.01	230.98
Pickup Truck	11.00	0.03	0.02	1.98	0.14	0.18	0.00	283.44	0.03	0.03	291.89
Water and Road Preparation Materials Truck	12.00	2.15	1.93	15.85	7.49	35.35	0.04	4,016.07	0.01	0.01	4,018.10
General Materials Delivery Truck for general cons	3.00	0.05	0.04	0.36	0.17	0.81	0.00	92.04	0.00	0.00	92.08
General Materials Delivery Truck for bridge	-	-	-	-	-	-	-	-	-	-	-
Steel Piling Delivery Truck	-	-	-	-	-	-	-	-	-	-	-
PV Panels Delivery Truck	6.00	0.10	0.09	0.73	0.34	1.62	0.00	184.07	0.00	0.00	184.16
Tracker Steel Delivery Truck	8.00	0.13	0.12	0.97	0.46	2.16	0.00	245.43	0.00	0.00	245.55
Suncatcher Delivery Truck	-	-	-	-	-	-	-	-	-	-	-
Electrical and Control Systems Delivery Truck	2.00	0.03	0.03	0.24	0.11	0.54	0.00	61.36	0.00	0.00	61.39
Tracker Delivery Truck	2.00	0.03	0.03	0.24	0.11	0.54	0.00	61.36	0.00	0.00	61.39
Water Delivery Trucks	-	-	-	-	-	-	-	-	-	-	-
Worker Passenger Vehicles	180.00	0.14	0.10	9.59	0.66	0.89	0.01	1,374.25	0.13	0.12	1,415.23
Total	**315.00**	**16.74**	**15.31**	**199.57**	**46.75**	**293.52**	**0.32**	**30,452.99**	**5.11**	**0.16**	**30,611.09**

	Month 3 Daily Emissions (lb/day)										
	Quantity Mo 3	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e
Diesel Construction Equipment											
Air Compressor	1.00	0.13	0.12	1.36	0.56	1.15	0.00	106.81	0.05	-	107.88
Asphalt Paver	-	-	-	-	-	-	-	-	-	-	-
Backhoe	5.00	1.21	1.11	8.51	2.13	13.29	0.01	1,214.52	0.19	-	1,218.56
Compactor	3.00	0.90	0.83	5.88	1.69	10.40	0.01	830.99	0.15	-	834.20
Crane small (Hydraulic Vibrating Post Driver and	15.00	3.47	3.19	31.44	7.80	59.93	0.06	5,177.57	0.70	-	5,192.35
Crane large	1.00	0.41	0.38	3.99	1.10	10.66	0.01	1,083.24	0.10	-	1,085.31
Dozer	1.00	0.46	0.43	3.39	1.21	11.46	0.01	979.30	0.11	-	981.59
Generator	1.00	0.21	0.19	2.16	0.84	2.27	0.00	226.41	0.08	-	227.99
Grader	1.00	0.45	0.42	4.29	1.01	7.84	0.01	718.10	0.09	-	720.01
Light Tower	-	-	-	-	-	-	-	-	-	-	-
Loader	10.00	3.04	2.80	22.72	8.06	82.83	0.09	8,037.52	0.73	-	8,052.79
Maxi Sneeker (Trencher)	5.00	1.42	1.30	15.26	6.42	12.66	0.01	1,151.09	0.58	-	1,163.26
Skid Steer (Bobcat)	5.00	0.67	0.62	7.76	2.43	7.63	0.01	790.38	0.22	-	794.99
Welding Machine	2.00	0.26	0.24	2.74	1.12	2.46	0.00	233.41	0.10	-	235.54
Equipment fueled with Propane											
Aerial Lift	6.00	0.09	0.09	43.36	0.15	6.22	-	955.78	1.27	-	982.47
Fork Lift	6.00	0.03	0.03	5.31	0.05	2.18	-	329.30	0.43	-	338.23
Telehandler	1.00	0.01	0.01	7.23	0.03	1.04	-	159.30	0.21	-	163.74
Vehicles with Onroad Engines for Emissions Estimates											
Concrete Delivery Truck for general construction	6.00	0.10	0.09	0.73	0.34	1.62	0.00	184.07	0.00	0.00	184.16
Concrete Delivery Truck for bridge	-	-	-	-	-	-	-	-	-	-	-
Concrete Pump Truck for bridge	-	-	-	-	-	-	-	-	-	-	-
Dump Truck	7.00	0.21	0.19	1.56	0.74	3.48	0.00	395.33	0.00	0.00	395.53
Flatbed Truck	9.00	0.19	0.17	1.68	0.15	2.99	0.00	483.32	0.00	0.00	483.50
Staff & Security Truck	6.00	0.01	0.01	1.47	0.04	0.02	0.01	228.55	0.01	0.01	230.98
Pickup Truck	11.00	0.03	0.02	1.98	0.14	0.18	0.00	283.44	0.03	0.03	291.89
Water and Road Preparation Materials Truck	8.00	1.43	1.29	10.57	4.99	23.57	0.03	2,677.38	0.00	0.00	2,678.73
General Materials Delivery Truck for general cons	3.00	0.05	0.04	0.36	0.17	0.81	0.00	92.04	0.00	0.00	92.08
General Materials Delivery Truck for bridge	-	-	-	-	-	-	-	-	-	-	-
Steel Piling Delivery Truck	-	-	-	-	-	-	-	-	-	-	-
PV Panels Delivery Truck	6.00	0.10	0.09	0.73	0.34	1.62	0.00	184.07	0.00	0.00	184.16
Tracker Steel Delivery Truck	8.00	0.13	0.12	0.97	0.46	2.16	0.00	245.43	0.00	0.00	245.55
Suncatcher Delivery Truck	-	-	-	-	-	-	-	-	-	-	-
Electrical and Control Systems Delivery Truck	2.00	0.03	0.03	0.24	0.11	0.54	0.00	61.36	0.00	0.00	61.39
Tracker Delivery Truck	2.00	0.03	0.03	0.24	0.11	0.54	0.00	61.36	0.00	0.00	61.39
Water Delivery Trucks	-	-	-	-	-	-	-	-	-	-	-
Worker Passenger Vehicles	249.00	0.19	0.14	13.27	0.91	1.24	0.02	1,901.05	0.19	0.17	1,957.74
Total	**380.00**	**15.26**	**13.97**	**199.19**	**43.11**	**270.79**	**0.30**	**28,791.11**	**5.24**	**0.21**	**28,966.01**

	Month 4 Daily Emissions (lb/day)										
	Quantity Mo 4	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e
Diesel Construction Equipment											
Air Compressor	1.00	0.13	0.12	1.36	0.56	1.15	0.00	106.81	0.05	-	107.88
Asphalt Paver	-	-	-	-	-	-	-	-	-	-	-
Backhoe	5.00	1.21	1.11	8.51	2.13	13.29	0.01	1,214.52	0.19	-	1,218.56
Compactor	3.00	0.90	0.83	5.88	1.69	10.40	0.01	830.99	0.15	-	834.20
Crane small (Hydraulic Vibrating Post Driver and	15.00	3.47	3.19	31.44	7.80	59.93	0.06	5,177.57	0.70	-	5,192.35
Crane large	2.00	0.82	0.76	7.97	2.19	21.32	0.02	2,166.47	0.20	-	2,170.62
Dozer	1.00	0.46	0.43	3.39	1.21	11.46	0.01	979.30	0.11	-	981.59
Generator	1.00	0.21	0.19	2.16	0.84	2.27	0.00	226.41	0.08	-	227.99
Grader	1.00	0.45	0.42	4.29	1.01	7.84	0.01	718.10	0.09	-	720.01
Light Tower	1.00	0.16	0.15	1.81	0.64	1.73	0.00	173.38	0.06	-	174.59
Loader	10.00	3.04	2.80	22.72	8.06	82.83	0.09	8,037.52	0.73	-	8,052.79
Maxi Sneeker (Trencher)	5.00	1.42	1.30	15.26	6.42	12.66	0.01	1,151.09	0.58	-	1,163.26
Skid Steer (Bobcat)	5.00	0.67	0.62	7.76	2.43	7.63	0.01	790.38	0.22	-	794.99
Welding Machine	3.00	0.39	0.36	4.11	1.68	3.68	0.00	350.12	0.15	-	353.30
Equipment fueled with Propane											
Aerial Lift	6.00	0.09	0.09	43.36	0.15	6.22	-	955.78	1.27	-	982.47
Fork Lift	6.00	0.03	0.03	5.31	0.05	2.18	-	329.30	0.43	-	338.23
Telehandler	1.00	0.01	0.01	7.23	0.03	1.04	-	159.30	0.21	-	163.74
Vehicles with Onroad Engines for Emissions Estimates											
Concrete Delivery Truck for general construction	-	-	-	-	-	-	-	-	-	-	-
Concrete Delivery Truck for bridge	-	-	-	-	-	-	-	-	-	-	-
Concrete Pump Truck for bridge	-	-	-	-	-	-	-	-	-	-	-
Dump Truck	6.00	0.18	0.16	1.34	0.63	2.98	0.00	338.86	0.00	0.00	339.03
Flatbed Truck	10.00	0.21	0.19	1.86	0.16	3.32	0.00	537.03	0.00	0.00	537.22
Staff & Security Truck	6.00	0.01	0.01	1.47	0.04	0.02	0.01	228.55	0.01	0.01	230.98
Pickup Truck	11.00	0.03	0.02	1.98	0.14	0.18	0.00	283.44	0.03	0.03	291.89
Water and Road Preparation Materials Truck	8.00	1.43	1.29	10.57	4.99	23.57	0.03	2,677.38	0.00	0.00	2,678.73
General Materials Delivery Truck for general cons	3.00	0.05	0.04	0.36	0.17	0.81	0.00	92.04	0.00	0.00	92.08
General Materials Delivery Truck for bridge	-	-	-	-	-	-	-	-	-	-	-
Steel Piling Delivery Truck	-	-	-	-	-	-	-	-	-	-	-
PV Panels Delivery Truck	3.00	0.05	0.04	0.36	0.17	0.81	0.00	92.04	0.00	0.00	92.08
Tracker Steel Delivery Truck	6.00	0.10	0.09	0.73	0.34	1.62	0.00	184.07	0.00	0.00	184.16
Tracker Delivery Truck	8.00	0.13	0.12	0.97	0.46	2.16	0.00	245.43	0.00	0.00	245.55
Suncatcher Delivery Truck	-	-	-	-	-	-	-	-	-	-	-
Electrical and Control Systems Delivery Truck	2.00	0.03	0.03	0.24	0.11	0.54	0.00	61.36	0.00	0.00	61.39
Tracker Delivery Truck	2.00	0.03	0.03	0.24	0.11	0.54	0.00	61.36	0.00	0.00	61.39
Water Delivery Trucks	-	-	-	-	-	-	-	-	-	-	-
Worker Passenger Vehicles	219.00	0.17	0.13	11.67	0.80	1.09	0.02	1,672.01	0.16	0.15	1,721.87
Total	**350.00**	**15.89**	**14.55**	**204.36**	**45.04**	**283.28**	**0.32**	**29,840.58**	**5.42**	**0.19**	**30,012.94**

MONTHLY EMISSIONS (month 21-41)

	Month 21 Daily Emissions (lb/day)										
	Quantity Mo 21	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e
Diesel Construction Equipment											
Air Compressor	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Paver	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Backhoe	5	1.21	1.11	8.51	2.13	13.29	0.01	1214.52	0.19	0.00	1218.56
Compactor	5	1.51	1.39	9.81	2.82	17.33	0.02	1384.99	0.25	0.00	1390.33
Crane small (Hydraulic Vibrating Post Driver and	15	3.47	3.19	31.44	7.80	59.93	0.06	5177.57	0.70	0.00	5192.35
Crane large	1	0.41	0.38	3.99	1.10	10.66	0.01	1083.24	0.10	0.00	1085.31
Dozer	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Generator	2	0.42	0.39	4.32	1.67	4.55	0.01	452.81	0.15	0.00	455.98
Grader	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Tower	1	0.16	0.15	1.81	0.64	1.73	0.00	173.38	0.06	0.00	174.59
Loader	10	3.04	2.80	22.72	8.06	82.83	0.09	8037.52	0.73	0.00	8052.79
Maxi Sneeker (Trencher)	5	1.42	1.30	15.26	6.42	12.66	0.01	1151.09	0.58	0.00	1163.26
Skid Steer (Bobcat)	5	0.67	0.62	7.76	2.43	7.63	0.01	790.38	0.22	0.00	794.99
Welding Machine	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Equipment fueled with Propane											
Aerial Lift	2	0.03	0.03	14.45	0.05	2.07	0.00	318.59	0.42	0.00	327.49
Fork Lift	6	0.03	0.03	5.31	0.05	2.18	0.00	329.30	0.43	0.00	338.23
Telehandler	3	0.04	0.04	21.68	0.08	3.11	0.00	477.89	0.64	0.00	491.23
Vehicles with Onroad Engines for Emissions Estimates											
Concrete Delivery Truck for general construction	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Concrete Delivery Truck for bridge	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Concrete Pump Truck for bridge	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dump Truck	5	0.15	0.14	1.11	0.53	2.49	0.00	282.38	0.00	0.00	282.52
Flatbed Truck	10	0.21	0.19	1.86	0.16	3.32	0.00	537.03	0.00	0.00	537.22
Staff & Security Truck	6	0.01	0.01	1.47	0.04	0.02	0.01	228.55	0.01	0.01	230.98
Pickup Truck	11	0.03	0.02	1.98	0.14	0.18	0.00	283.44	0.03	0.03	291.89
Water and Road Preparation Materials Truck	5	0.90	0.80	6.61	3.12	14.73	0.02	1673.36	0.00	0.00	1674.21
General Materials Delivery Truck for general cons	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Materials Delivery Truck for bridge	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Steel Piling Delivery Truck	3	0.05	0.04	0.36	0.17	0.81	0.00	92.04	0.00	0.00	92.08
PV Panels Delivery Truck	6	0.10	0.09	0.73	0.34	1.62	0.00	184.07	0.00	0.00	184.16
Tracker Steel Delivery Truck	8	0.13	0.12	0.97	0.46	2.16	0.00	245.43	0.00	0.00	245.55
Suncatcher Delivery Truck	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Electrical and Control Systems Delivery Truck	2	0.03	0.03	0.24	0.11	0.54	0.00	61.36	0.00	0.00	61.39
Tracker Delivery Truck	2	0.03	0.03	0.24	0.11	0.54	0.00	61.36	0.00	0.00	61.39
Water Delivery Trucks	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Passenger Vehicles	209	0.16	0.12	11.13	0.77	1.04	0.02	1595.66	0.16	0.14	1643.24
Total	**327**	**14.20**	**13.01**	**173.78**	**39.20**	**245.43**	**0.28**	**25835.96**	**4.67**	**0.18**	**25989.75**

	Month 22 Daily Emissions (lb/day)										
	Quantity Mo 22	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e
Diesel Construction Equipment											
Air Compressor	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Paver	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Backhoe	5	1.21	1.11	8.51	2.13	13.29	0.01	1214.52	0.19	0.00	1218.56
Compactor	5	1.51	1.39	9.81	2.82	17.33	0.02	1384.99	0.25	0.00	1390.33
Crane small (Hydraulic Vibrating Post Driver and	15	3.47	3.19	31.44	7.80	59.93	0.06	5177.57	0.70	0.00	5192.35
Crane large	1	0.41	0.38	3.99	1.10	10.66	0.01	1083.24	0.10	0.00	1085.31
Dozer	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Generator	2	0.42	0.39	4.32	1.67	4.55	0.01	452.81	0.15	0.00	455.98
Grader	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Tower	1	0.16	0.15	1.81	0.64	1.73	0.00	173.38	0.06	0.00	174.59
Loader	10	3.04	2.80	22.72	8.06	82.83	0.09	8037.52	0.73	0.00	8052.79
Maxi Sneeker (Trencher)	5	1.42	1.30	15.26	6.42	12.66	0.01	1151.09	0.58	0.00	1163.26
Skid Steer (Bobcat)	5	0.67	0.62	7.76	2.43	7.63	0.01	790.38	0.22	0.00	794.99
Welding Machine	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Equipment fueled with Propane											
Aerial Lift	2	0.03	0.03	14.45	0.05	2.07	0.00	318.59	0.42	0.00	327.49
Fork Lift	6	0.03	0.03	5.31	0.05	2.18	0.00	329.30	0.43	0.00	338.23
Telehandler	3	0.04	0.04	21.68	0.08	3.11	0.00	477.89	0.64	0.00	491.23
Vehicles with Onroad Engines for Emissions Estimates											
Concrete Delivery Truck for general construction	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Concrete Delivery Truck for bridge	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Concrete Pump Truck for bridge	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dump Truck	5	0.15	0.14	1.11	0.53	2.49	0.00	282.38	0.00	0.00	282.52
Flatbed Truck	10	0.21	0.19	1.86	0.16	3.32	0.00	537.03	0.00	0.00	537.22
Staff & Security Truck	6	0.01	0.01	1.47	0.04	0.02	0.01	228.55	0.01	0.01	230.98
Pickup Truck	11	0.03	0.02	1.98	0.14	0.18	0.00	283.44	0.03	0.03	291.89
Water and Road Preparation Materials Truck	5	0.90	0.80	6.61	3.12	14.73	0.02	1673.36	0.00	0.00	1674.21
General Materials Delivery Truck for general cons	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Materials Delivery Truck for bridge	0	0.00	0.00	0.00	0.00	0.00

Month 5 Daily Emissions (lb/day)

Quantity Mo 5	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e
1.00	0.13	0.12	1.36	0.56	1.15	0.00	106.81	0.05	-	107.88
-	-	-	-	-	-	-	-	-	-	-
5.00	1.21	1.11	8.51	2.13	13.29	0.01	1,214.52	0.19	-	1,218.56
3.00	0.90	0.83	5.88	1.69	10.40	0.01	830.99	0.15	-	834.20
15.00	3.47	3.19	31.44	7.80	59.93	0.06	5,177.57	0.70	-	5,192.35
2.00	0.82	0.76	7.97	2.19	21.32	0.02	2,166.47	0.20	-	2,170.62
1.00	0.46	0.43	3.39	1.21	11.46	0.01	979.30	0.11	-	981.59
1.00	0.21	0.19	2.16	0.84	2.27	0.00	226.41	0.08	-	227.99
1.00	0.45	0.42	4.29	1.01	7.84	0.01	718.10	0.09	-	720.01
2.00	0.33	0.30	3.63	1.28	3.45	0.00	346.76	0.12	-	349.18
10.00	3.04	2.80	22.72	8.06	82.83	0.09	8,037.52	0.73	-	8,052.79
5.00	1.42	1.30	15.26	6.42	12.66	0.01	1,151.09	0.58	-	1,163.26
5.00	0.67	0.62	7.76	2.43	7.63	0.01	790.38	0.22	-	794.99
5.00	0.65	0.60	6.85	2.80	6.14	0.01	583.53	0.25	-	588.84
-	-	-	-	-	-	-	-	-	-	-
6.00	0.09	0.09	43.36	0.15	6.22	-	955.78	1.27	-	982.47
6.00	0.03	0.03	5.31	0.05	2.18	-	329.30	0.43	-	338.23
2.00	0.03	0.03	14.45	0.05	2.07	-	318.59	0.42	-	327.49
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
5.00	0.15	0.14	1.11	0.53	2.49	0.00	282.38	0.00	0.00	282.52
10.00	0.21	0.19	1.86	0.16	3.32	0.00	537.03	0.00	0.00	537.22
6.00	0.01	0.01	1.47	0.04	0.02	0.01	228.55	0.01	0.01	230.98
11.00	0.03	0.02	1.98	0.14	0.18	0.00	283.44	0.03	0.03	291.89
7.00	1.25	1.13	9.25	4.37	20.62	0.02	2,342.71	0.00	0.00	2,343.89
3.00	0.05	0.04	0.36	0.17	0.81	0.00	92.04	0.00	0.00	92.08
-	-	-	-	-	-	-	-	-	-	-
3.00	0.05	0.04	0.36	0.17	0.81	0.00	92.04	0.00	0.00	92.08
6.00	0.10	0.09	0.73	0.34	1.62	0.00	184.07	0.00	0.00	184.16
8.00	0.13	0.12	0.97	0.46	2.16	0.00	245.43	0.00	0.00	245.55
-	-	-	-	-	-	-	-	-	-	-
2.00	0.03	0.03	0.24	0.11	0.54	0.00	61.36	0.00	0.00	61.39
2.00	0.03	0.03	0.24	0.11	0.54	0.00	61.36	0.00	0.00	61.39
-	-	-	-	-	-	-	-	-	-	-
219.00	0.17	0.13	11.67	0.80	1.09	0.02	1,672.01	0.16	0.15	1,721.87
352.00	**16.12**	**14.76**	**214.60**	**46.09**	**285.06**	**0.32**	**30,015.52**	**5.79**	**0.19**	**30,195.47**

Month 6 Daily Emissions (lb/day)

Quantity Mo 6	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e
1.00	0.13	0.12	1.36	0.56	1.15	0.00	106.81	0.05	-	107.88
-	-	-	-	-	-	-	-	-	-	-
6.00	1.45	1.33	10.21	2.56	15.95	0.02	1,457.42	0.23	-	1,462.27
3.00	0.90	0.83	5.88	1.69	10.40	0.01	830.99	0.15	-	834.20
15.00	3.47	3.19	31.44	7.80	59.93	0.06	5,177.57	0.70	-	5,192.35
2.00	0.82	0.76	7.97	2.19	21.32	0.02	2,166.47	0.20	-	2,170.62
1.00	0.46	0.43	3.39	1.21	11.46	0.01	979.30	0.11	-	981.59
2.00	0.42	0.39	4.32	1.67	4.55	0.01	452.81	0.15	-	455.98
1.00	0.45	0.42	4.29	1.01	7.84	0.01	718.10	0.09	-	720.01
2.00	0.33	0.30	3.63	1.28	3.45	0.00	346.76	0.12	-	349.18
10.00	3.04	2.80	22.72	8.06	82.83	0.09	8,037.52	0.73	-	8,052.79
5.00	1.42	1.30	15.26	6.42	12.66	0.01	1,151.09	0.58	-	1,163.26
5.00	0.67	0.62	7.76	2.43	7.63	0.01	790.38	0.22	-	794.99
5.00	0.65	0.60	6.85	2.80	6.14	0.01	583.53	0.25	-	588.84
-	-	-	-	-	-	-	-	-	-	-
6.00	0.09	0.09	43.36	0.15	6.22	-	955.78	1.27	-	982.47
6.00	0.03	0.03	5.31	0.05	2.18	-	329.30	0.43	-	338.23
6.00	0.09	0.09	43.36	0.15	6.22	-	955.78	1.27	-	982.47
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
5.00	0.15	0.14	1.11	0.53	2.49	0.00	282.38	0.00	0.00	282.52
10.00	0.21	0.19	1.86	0.16	3.32	0.00	537.03	0.00	0.00	537.22
6.00	0.01	0.01	1.47	0.04	0.02	0.01	228.55	0.01	0.01	230.98
11.00	0.03	0.02	1.98	0.14	0.18	0.00	283.44	0.03	0.03	291.89
5.00	0.90	0.80	6.61	3.12	14.73	0.02	1,673.36	0.00	0.00	1,674.21
3.00	0.05	0.04	0.36	0.17	0.81	0.00	92.04	0.00	0.00	92.08
-	-	-	-	-	-	-	-	-	-	-
3.00	0.05	0.04	0.36	0.17	0.81	0.00	92.04	0.00	0.00	92.08
6.00	0.10	0.09	0.73	0.34	1.62	0.00	184.07	0.00	0.00	184.16
8.00	0.13	0.12	0.97	0.46	2.16	0.00	245.43	0.00	0.00	245.55
-	-	-	-	-	-	-	-	-	-	-
2.00	0.03	0.03	0.24	0.11	0.54	0.00	61.36	0.00	0.00	61.39
2.00	0.03	0.03	0.24	0.11	0.54	0.00	61.36	0.00	0.00	61.39
-	-	-	-	-	-	-	-	-	-	-
320.00	0.24	0.19	17.05	1.17	1.59	0.02	2,443.11	0.24	0.22	2,515.97
457.00	**16.34**	**14.97**	**250.11**	**46.58**	**288.75**	**0.32**	**31,223.78**	**6.83**	**0.26**	**31,446.57**

Month 7 Daily Emissions (lb/day)

Quantity Mo 7	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e
1.00	0.13	0.12	1.36	0.56	1.15	0.00	106.81	0.05	-	107.88
-	-	-	-	-	-	-	-	-	-	-
5.00	1.21	1.11	8.51	2.13	13.29	0.01	1,214.52	0.19	-	1,218.56
5.00	1.51	1.39	9.81	2.82	17.33	0.02	1,384.99	0.25	-	1,390.33
15.00	3.47	3.19	31.44	7.80	59.93	0.06	5,177.57	0.70	-	5,192.35
3.00	1.24	1.14	11.96	3.29	31.98	0.03	3,249.71	0.30	-	3,255.94
1.00	0.46	0.43	3.39	1.21	11.46	0.01	979.30	0.11	-	981.59
3.00	0.64	0.58	6.48	2.51	6.82	0.01	679.22	0.23	-	683.97
1.00	0.45	0.42	4.29	1.01	7.84	0.01	718.10	0.09	-	720.01
2.00	0.33	0.30	3.63	1.28	3.45	0.00	346.76	0.12	-	349.18
10.00	3.04	2.80	22.72	8.06	82.83	0.09	8,037.52	0.73	-	8,052.79
5.00	1.42	1.30	15.26	6.42	12.66	0.01	1,151.09	0.58	-	1,163.26
5.00	0.67	0.62	7.76	2.43	7.63	0.01	790.38	0.22	-	794.99
5.00	0.65	0.60	6.85	2.80	6.14	0.01	583.53	0.25	-	588.84
-	-	-	-	-	-	-	-	-	-	-
6.00	0.09	0.09	43.36	0.15	6.22	-	955.78	1.27	-	982.47
6.00	0.03	0.03	5.31	0.05	2.18	-	329.30	0.43	-	338.23
5.00	0.07	0.07	36.13	0.13	5.18	-	796.49	1.06	-	818.72
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
5.00	0.15	0.14	1.11	0.53	2.49	0.00	282.38	0.00	0.00	282.52
10.00	0.21	0.19	1.86	0.16	3.32	0.00	537.03	0.00	0.00	537.22
6.00	0.01	0.01	1.47	0.04	0.02	0.01	228.55	0.01	0.01	230.98
11.00	0.03	0.02	1.98	0.14	0.18	0.00	283.44	0.03	0.03	291.89
5.00	0.90	0.80	6.61	3.12	14.73	0.02	1,673.36	0.00	0.00	1,674.21
3.00	0.05	0.04	0.36	0.17	0.81	0.00	92.04	0.00	0.00	92.08
-	-	-	-	-	-	-	-	-	-	-
3.00	0.05	0.04	0.36	0.17	0.81	0.00	92.04	0.00	0.00	92.08
6.00	0.10	0.09	0.73	0.34	1.62	0.00	184.07	0.00	0.00	184.16
8.00	0.13	0.12	0.97	0.46	2.16	0.00	245.43	0.00	0.00	245.55
-	-	-	-	-	-	-	-	-	-	-
2.00	0.03	0.03	0.24	0.11	0.54	0.00	61.36	0.00	0.00	61.39
2.00	0.03	0.03	0.24	0.11	0.54	0.00	61.36	0.00	0.00	61.39
-	-	-	-	-	-	-	-	-	-	-
340.00	0.26	0.20	18.11	1.25	1.69	0.03	2,595.81	0.25	0.23	2,673.22
479.00	**17.33**	**15.88**	**252.31**	**49.26**	**305.02**	**0.34**	**32,837.92**	**6.87**	**0.27**	**33,065.80**

Month 8 Daily Emissions (lb/day)

Quantity Mo 8	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e
3.00	0.38	0.35	4.08	1.69	3.44	0.00	320.42	0.15	-	323.63
-	-	-	-	-	-	-	-	-	-	-
5.00	1.21	1.11	8.51	2.13	13.29	0.01	1,214.52	0.19	-	1,218.56
5.00	1.51	1.39	9.81	2.82	17.33	0.02	1,384.99	0.25	-	1,390.33
15.00	3.47	3.19	31.44	7.80	59.93	0.06	5,177.57	0.70	-	5,192.35
1.00	0.41	0.38	3.99	1.10	10.66	0.01	1083.24	0.10	-	1085.85
1.00	0.46	0.43	3.39	1.21	11.46	0.01	979.30	0.11	-	981.59
2.00	0.42	0.39	4.32	1.67	4.55	0.01	452.81	0.15	-	455.98
1.00	0.45	0.42	4.29	1.01	7.84	0.01	718.10	0.09	-	720.01
2.00	0.33	0.30	3.63	1.28	3.45	0.00	346.76	0.12	-	349.18
10.00	3.04	2.80	22.72	8.06	82.83	0.09	8,037.52	0.73	-	8,052.79
5.00	1.42	1.30	15.26	6.42	12.66	0.01	1,151.09	0.58	-	1,163.26
5.00	0.67	0.62	7.76	2.43	7.63	0.01	790.38	0.22	-	794.99
5.00	0.65	0.60	6.85	2.80	6.14	0.01	583.53	0.25	-	588.84
-	-	-	-	-	-	-	-	-	-	-
6.00	0.09	0.09	43.36	0.15	6.22	-	955.78	1.27	-	982.47
6.00	0.03	0.03	5.31	0.05	2.18	-	329.30	0.43	-	338.23
5.00	0.07	0.07	36.13	0.13	5.18	-	796.49	1.06	-	818.72
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
5.00	0.15	0.14	1.11	0.53	2.49	0.00	282.38	0.00	0.00	282.52
10.00	0.21	0.19	1.86	0.16	3.32	0.00	537.03	0.00	0.00	537.22
6.00	0.01	0.01	1.47	0.04	0.02	0.01	228.55	0.01	0.01	230.98
11.00	0.03	0.02	1.98	0.14	0.18	0.00	283.44	0.03	0.03	291.89
5.00	0.90	0.80	6.61	3.12	14.73	0.02	1,673.36	0.00	0.00	1,674.21
3.00	0.05	0.04	0.36	0.17	0.81	0.00	92.04	0.00	0.00	92.08
-	-	-	-	-	-	-	-	-	-	-
1.00	0.02	0.01	0.12	0.06	0.27	0.00	30.68	0.00	0.00	30.69
6.00	0.10	0.09	0.73	0.34	1.62	0.00	184.07	0.00	0.00	184.16
8.00	0.13	0.12	0.97	0.46	2.16	0.00	245.43	0.00	0.00	245.55
-	-	-	-	-	-	-	-	-	-	-
2.00	0.03	0.03	0.24	0.11	0.54	0.00	61.36	0.00	0.00	61.39
2.00	0.03	0.03	0.24	0.11	0.54	0.00	61.36	0.00	0.00	61.39
-	-	-	-	-	-	-	-	-	-	-
330.00	0.25	0.19	17.58	1.21	1.64	0.02	2,519.46	0.25	0.23	2,594.60
466.00	**16.51**	**15.12**	**244.12**	**47.21**	**283.13**	**0.32**	**30,520.95**	**6.69**	**0.26**	**30,742.92**

Month 25 Daily Emissions (lb/day)

Quantity Mo 25	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e
1	0.13	0.12	1.36	0.56	1.15	0.00	106.81	0.05	0.00	107.88
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	1.45	1.33	10.21	2.56	15.95	0.02	1457.42	0.23	0.00	1462.27
6	1.81	1.66	11.77	3.38	20.80	0.02	1661.99	0.31	0.00	1668.40
15	3.47	3.19	31.44	7.80	59.93	0.06	5177.57	0.70	0.00	5192.35
1	0.41	0.38	3.99	1.10	10.66	0.01	1083.24	0.10	0.00	1085.31
1	0.46	0.43	3.39	1.21	11.46	0.01	979.30	0.11	0.00	981.59
1	0.21	0.19	2.16	0.84	2.27	0.00	226.41	0.08	0.00	227.99
1	0.45	0.42	4.29	1.01	7.84	0.01	718.10	0.09	0.00	720.01
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	3.04	2.80	22.72	8.06	82.83	0.09	8037.52	0.73	0.00	8052.79
5	1.42	1.30	15.26	6.42	12.66	0.01	1151.09	0.58	0.00	1163.26
5	0.67	0.62	7.76	2.43	7.63	0.01	790.38	0.22	0.00	794.99
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.03	0.03	14.45	0.05	2.07	0.00	318.59	0.42	0.00	327.49
6	0.03	0.03	5.31	0.05	2.18	0.00	329.30	0.43	0.00	338.23
3	0.04	0.04	21.68	0.08	3.11	0.00	477.89	0.64	0.00	491.23
2	0.03	0.03	14.45	0.05	2.07	0.00	318.59	0.42	0.00	327.49
6	0.03	0.03	5.31	0.05	2.18	0.00	329.30	0.43	0.00	338.23
3	0.04	0.04	21.68	0.08	3.11	0.00	477.89	0.64	0.00	491.23
5	0.67	0.62	7.76	2.43	7.63	0.01	790.38	0.22	0.00	794.99
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.03	0.03	14.45	0.05	2.07	0.00	318.59	0.42	0.00	327.49
6	0.03	0.03	5.31	0.05	2.18	0.00	329.30	0.43	0.00	338.23
3	0.04	0.04	21.68	0.08	3.11	0.00	477.89	0.64	0.00	491.23
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1	0.01	0.01	0.11	0.05	0.25	0.00	27.89	0.00	0.00	27.90
1	0.02	0.01	0.12	0.06	0.27	0.00	30.68	0.00	0.00	30.69
6	0.18	0.16	1.34	0.63	2.98	0.00	338.86	0.00	0.00	339.03
10	0.21	0.19	1.86	0.16	3.32	0.00	537.03	0.00	0.00	537.22
6	0.01	0.01	1.47	0.04	0.02	0.01	228.55	0.01	0.01	230.98
11	0.03	0.02	1.98	0.14	0.18	0.00	283.44	0.03	0.03	291.89
4	0.72	0.64	5.28	2.50	11.78	0.01	1338.69	0.00	0.00	1339.37
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.03	0.03	0.22	0.10	0.49	0.00	55.78	0.00	0.00	55.81
3	0.05	0.04	0.36	0.17	0.81	0.00	92.04	0.00	0.00	92.08
6	0.10	0.09	0.73	0.34	1.62	0.00	184.07	0.00	0.00	184.16
8	0.13	0.12	0.97	0.46	2.16	0.00	245.43	0.00	0.00	245.55
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.03	0.03	0.24	0.11	0.54	0.00	61.36	0.00	0.00	61.39
2	0.03	0.03	0.24	0.11	0.54	0.00	61.36	0.00	0.00	61.39
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
208	0.16	0.12	11.08	0.76	1.03	0.02	1588.02	0.15	0.14	1635.38
333	**15.32**	**14.04**	**181.80**	**41.19**	**266.56**	**0.30**	**27588.79**	**4.87**	**0.18**	**27746.63**

Month 26 Daily Emissions (lb/day)

Quantity Mo 26	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e
1	0.13	0.12	1.36	0.56	1.15	0.00	106.81	0.05	0.00	107.88
1	0.50	0.46	3.08	0.97	5.71	0.00	407.89	0.09	0.00	409.72
6	1.45	1.33	10.21	2.56	15.95	0.02	1457.42	0.23	0.00	1462.27
6	1.81	1.66	11.77	3.38	20.80	0.02	1661.99	0.31	0.00	1668.40
15	3.47	3.19	31.44	7.80	59.93	0.06	5177.57	0.70	0.00	5192.35
1	0.41	0.38	3.99	1.10	10.66	0.01	1083.24	0.10	0.00	1085.31
1	0.46	0.43	3.39	1.21	11.46	0.01	979.30	0.11	0.00	981.59
1	0.21	0.19	2.16	0.84	2.27	0.00	226.41	0.08	0.00	227.99
1	0.45	0.42	4.29	1.01	7.84	0.01	718.10	0.09	0.00	720.01
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	3.04	2.80	22.72	8.06	82.83	0.09	8037.52	0.73	0.00	8052.79
5	1.42	1.30	15.26	6.42	12.66	0.01	1151.09	0.58	0.00	1163.26
5	0.67	0.62	7.76	2.43	7.63	0.01	790.38	0.22	0.00	794.99
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.03	0.03	14.45	0.05	2.07	0.00	318.59	0.42	0.00	327.49
6	0.03	0.03	5.31	0.05	2.18	0.00	329.30	0.43	0.00	338.23
3	0.04	0.04	21.68	0.08	3.11	0.00	477.89	0.64	0.00	491.23
5	0.67	0.62	7.76	2.43	7.63	0.01	790.38	0.22	0.00	794.99
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.03	0.03	14.45	0.05	2.07	0.00	318.59	0.42	0.00	327.49
6	0.03	0.03	5.31	0.05	2.18	0.00	329.30	0.43	0.00	338.23
3	0.04	0.04	21.68	0.08	3.11	0.00	477.89	0.64	0.00	491.23
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1	0.01	0.01	0.11	0.05	0.25	0.00	27.89	0.00	0.00	27.90
1	0.02	0.01	0.12	0.06	0.27	0.00	30.68	0.00	0.00	30.69
6	0.18	0.16	1.34	0.63	2.98	0.00	338.86	0.00	0.00	339.03
11	0.23	0.20	2.05	0.18	3.65	0.01	590.73	0.00	0.00	590.94
6	0.01	0.01	1.47	0.04	0.02	0.01	228.55	0.01	0.01	230.98
11	0.03	0.02	1.98	0.14	0.18	0.00	283.44	0.03	0.03	291.89
4	0.72	0.64	5.28	2.50	11.78	0.01	1338.69	0.00	0.00	1339.37
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.03	0.03	0.22	0.10	0.49	0.00	55.78	0.00	0.00	55.81
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.10	0.09	0.73	0.34	1.62	0.00	184.07	0.00	0.00	184.16
8	0.13	0.12	0.97	0.46	2.16	0.00	245.43	0.00	0.00	245.55
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.03	0.03	0.24	0.11	0.54	0.00	61.36	0.00	0.00	61.39
2	0.03	0.03	0.24	0.11	0.54	0.00	61.36	0.00	0.00	61.39
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
208	0.16	0.12	11.08	0.76	1.03	0.02	1588.02	0.15	0.14	1635.38
332	**15.80**	**14.48**	**184.70**	**42.00**	**271.79**	**0.30**	**27958.35**	**4.96**	**0.18**	**28117.99**

Month 27 Daily Emissions (lb/day)

Quantity Mo 27	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e
1	0.13	0.12	1.36	0.56	1.15	0.00	106.81	0.05	0.00	107.88
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	1.45	1.33	10.21	2.56	15.95	0.02	1457.42	0.23	0.00	1462.27
6	1.81	1.66	11.77	3.38	20.80	0.02	1661.99	0.31	0.00	1668.40
15	3.47	3.19	31.44	7.80	59.93	0.06	5177.57	0.70	0.00	5192.35
1	0.41	0.38	3.99	1.10	10.66	0.01	1083.24	0.10	0.00	1085.31
1	0.46	0.43	3.39	1.21	11.46	0.01	979.30	0.11	0.00	981.59
1	0.21	0.19	2.16	0.84	2.27	0.00	226.41	0.08	0.00	227.99
1	0.45	0.42	4.29	1.01	7.84	0.01	718.10	0.09	0.00	720.01
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	3.04	2.80	22.72	8.06	82.83	0.09	8037.52	0.73	0.00	8052.79
5	1.42	1.30	15.26	6.42	12.66	0.01	1151.09	0.58	0.00	1163.26
5	0.67	0.62	7.76	2.43	7.63	0.01	790.38	0.22	0.00	794.99
0	0.00

Month 9 Daily Emissions (lb/day)

Quantity Mo 9	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e
3.00	0.38	0.35	4.08	1.69	3.44	0.00	320.42	0.15	-	323.63
-	-	-	-	-	-	-	-	-	-	-
5.00	1.21	1.11	8.51	2.13	13.29	0.01	1,214.52	0.19	-	1,218.56
5.00	1.51	1.39	9.81	2.82	17.33	0.02	1,384.99	0.25	-	1,390.33
15.00	3.47	3.19	31.44	7.80	59.93	0.06	5,177.57	0.70	-	5,192.35
-	-	-	-	-	-	-	-	-	-	-
1.00	0.46	0.43	3.39	1.21	11.46	0.01	979.30	0.11	-	981.59
5.00	1.06	0.97	10.80	4.18	11.37	0.01	1,132.03	0.38	-	1,139.95
1.00	0.45	0.42	4.29	1.01	7.84	0.01	718.10	0.09	-	720.01
2.00	0.33	0.30	3.63	1.28	3.45	0.00	346.76	0.12	-	349.18
10.00	3.04	2.80	22.72	8.06	82.83	0.09	8,037.52	0.73	-	8,052.79
5.00	1.42	1.30	15.26	6.42	12.66	0.01	1,151.09	0.58	-	1,163.26
5.00	0.67	0.62	7.76	2.43	7.63	0.01	790.38	0.22	-	794.99
5.00	0.65	0.60	6.85	2.80	6.14	0.01	583.53	0.25	-	588.84
3.00	0.04	0.04	21.68	0.08	3.11	-	477.89	0.64	-	491.23
6.00	0.03	0.03	5.31	0.05	2.18	-	329.30	0.43	-	338.23
3.00	0.04	0.04	21.68	0.08	3.11	-	477.89	0.64	-	491.23
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
5.00	0.15	0.14	1.11	0.53	2.49	0.00	282.38	0.00	0.00	282.52
10.00	0.21	0.19	1.86	0.16	3.32	0.00	537.03	0.00	0.00	537.22
6.00	0.01	0.01	1.47	0.04	0.02	0.01	228.55	0.01	0.01	230.98
11.00	0.03	0.02	1.98	0.14	0.18	0.00	283.44	0.03	0.03	291.89
5.00	0.90	0.80	6.61	3.12	14.73	0.02	1,673.36	0.00	0.00	1,674.21
3.00	0.05	0.04	0.36	0.17	0.81	0.00	92.04	0.00	0.00	92.08
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
6.00	0.10	0.09	0.73	0.34	1.62	0.00	184.07	0.00	0.00	184.16
8.00	0.13	0.12	0.97	0.46	2.16	0.00	245.43	0.00	0.00	245.55
-	-	-	-	-	-	-	-	-	-	-
2.00	0.03	0.03	0.24	0.11	0.54	0.00	61.36	0.00	0.00	61.39
2.00	0.03	0.03	0.24	0.11	0.54	0.00	61.36	0.00	0.00	61.39
-	-	-	-	-	-	-	-	-	-	-
334.00	0.25	0.19	17.79	1.23	1.66	0.02	2,550.00	0.25	0.23	2,626.05
466.00	**16.65**	**15.24**	**210.57**	**48.45**	**273.86**	**0.32**	**29,320.30**	**5.76**	**0.27**	**29,523.62**

Month 10 Daily Emissions (lb/day)

Quantity Mo 10	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e
2.00	0.26	0.24	2.72	1.13	2.29	0.00	213.61	0.10	-	215.75
-	-	-	-	-	-	-	-	-	-	-
5.00	1.21	1.11	8.51	2.13	13.29	0.01	1,214.52	0.19	-	1,218.56
5.00	1.51	1.39	9.81	2.82	17.33	0.02	1,384.99	0.25	-	1,390.33
15.00	3.47	3.19	31.44	7.80	59.93	0.06	5,177.57	0.70	-	5,192.35
-	-	-	-	-	-	-	-	-	-	-
1.00	0.46	0.43	3.39	1.21	11.46	0.01	979.30	0.11	-	981.59
5.00	1.06	0.97	10.80	4.18	11.37	0.01	1,132.03	0.38	-	1,139.95
1.00	0.45	0.42	4.29	1.01	7.84	0.01	718.10	0.09	-	720.01
2.00	0.33	0.30	3.63	1.28	3.45	0.00	346.76	0.12	-	349.18
10.00	3.04	2.80	22.72	8.06	82.83	0.09	8,037.52	0.73	-	8,052.79
5.00	1.42	1.30	15.26	6.42	12.66	0.01	1,151.09	0.58	-	1,163.26
5.00	0.67	0.62	7.76	2.43	7.63	0.01	790.38	0.22	-	794.99
5.00	0.65	0.60	6.85	2.80	6.14	0.01	583.53	0.25	-	588.84
3.00	0.04	0.04	21.68	0.08	3.11	-	477.89	0.64	-	491.23
6.00	0.03	0.03	5.31	0.05	2.18	-	329.30	0.43	-	338.23
3.00	0.04	0.04	21.68	0.08	3.11	-	477.89	0.64	-	491.23
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
5.00	0.15	0.14	1.11	0.53	2.49	0.00	282.38	0.00	0.00	282.52
10.00	0.21	0.19	1.86	0.16	3.32	0.00	537.03	0.00	0.00	537.22
6.00	0.01	0.01	1.47	0.04	0.02	0.01	228.55	0.01	0.01	230.98
11.00	0.03	0.02	1.98	0.14	0.18	0.00	283.44	0.03	0.03	291.89
5.00	0.90	0.80	6.61	3.12	14.73	0.02	1,673.36	0.00	0.00	1,674.21
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
6.00	0.10	0.09	0.73	0.34	1.62	0.00	184.07	0.00	0.00	184.16
8.00	0.13	0.12	0.97	0.46	2.16	0.00	245.43	0.00	0.00	245.55
-	-	-	-	-	-	-	-	-	-	-
2.00	0.03	0.03	0.24	0.11	0.54	0.00	61.36	0.00	0.00	61.39
2.00	0.03	0.03	0.24	0.11	0.54	0.00	61.36	0.00	0.00	61.39
-	-	-	-	-	-	-	-	-	-	-
305.00	0.23	0.18	16.25	1.12	1.52	0.02	2,328.59	0.23	0.21	2,398.04
433.00	**16.45**	**15.07**	**207.31**	**47.61**	**271.76**	**0.31**	**28,900.06**	**5.69**	**0.25**	**29,095.65**

Month 11 Daily Emissions (lb/day)

Quantity Mo 11	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e
2.00	0.26	0.24	2.72	1.13	2.29	0.00	213.61	0.10	-	215.75
-	-	-	-	-	-	-	-	-	-	-
5.00	1.21	1.11	8.51	2.13	13.29	0.01	1,214.52	0.19	-	1,218.56
5.00	1.51	1.39	9.81	2.82	17.33	0.02	1,384.99	0.25	-	1,390.33
15.00	3.47	3.19	31.44	7.80	59.93	0.06	5,177.57	0.70	-	5,192.35
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
5.00	1.06	0.97	10.80	4.18	11.37	0.01	1,132.03	0.38	-	1,139.95
-	-	-	-	-	-	-	-	-	-	-
2.00	0.33	0.30	3.63	1.28	3.45	0.00	346.76	0.12	-	349.18
10.00	3.04	2.80	22.72	8.06	82.83	0.09	8,037.52	0.73	-	8,052.79
5.00	1.42	1.30	15.26	6.42	12.66	0.01	1,151.09	0.58	-	1,163.26
5.00	0.67	0.62	7.76	2.43	7.63	0.01	790.38	0.22	-	794.99
5.00	0.65	0.60	6.85	2.80	6.14	0.01	583.53	0.25	-	588.84
2.00	0.03	0.03	14.45	0.05	2.07	-	318.59	0.42	-	327.49
6.00	0.03	0.03	5.31	0.05	2.18	-	329.30	0.43	-	338.23
3.00	0.04	0.04	21.68	0.08	3.11	-	477.89	0.64	-	491.23
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
5.00	0.15	0.14	1.11	0.53	2.49	0.00	282.38	0.00	0.00	282.52
10.00	0.21	0.19	1.86	0.16	3.32	0.00	537.03	0.00	0.00	537.22
6.00	0.01	0.01	1.47	0.04	0.02	0.01	228.55	0.01	0.01	230.98
11.00	0.03	0.02	1.98	0.14	0.18	0.00	283.44	0.03	0.03	291.89
5.00	0.90	0.80	6.61	3.12	14.73	0.02	1,673.36	0.00	0.00	1,674.21
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
6.00	0.10	0.09	0.73	0.34	1.62	0.00	184.07	0.00	0.00	184.16
8.00	0.13	0.12	0.97	0.46	2.16	0.00	245.43	0.00	0.00	245.55
-	-	-	-	-	-	-	-	-	-	-
2.00	0.03	0.03	0.24	0.11	0.54	0.00	61.36	0.00	0.00	61.39
2.00	0.03	0.03	0.24	0.11	0.54	0.00	61.36	0.00	0.00	61.39
-	-	-	-	-	-	-	-	-	-	-
305.00	0.23	0.18	16.25	1.12	1.52	0.02	2,328.59	0.23	0.21	2,398.04
430.00	**15.52**	**14.21**	**192.40**	**45.37**	**251.43**	**0.29**	**27,043.36**	**5.28**	**0.25**	**27,230.31**

Month 12 Daily Emissions (lb/day)

Quantity Mo 12	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e
2.00	0.26	0.24	2.72	1.13	2.29	0.00	213.61	0.10	-	215.75
-	-	-	-	-	-	-	-	-	-	-
5.00	1.21	1.11	8.51	2.13	13.29	0.01	1,214.52	0.19	-	1,218.56
5.00	1.51	1.39	9.81	2.82	17.33	0.02	1,384.99	0.25	-	1,390.33
15.00	3.47	3.19	31.44	7.80	59.93	0.06	5,177.57	0.70	-	5,192.35
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
5.00	1.06	0.97	10.80	4.18	11.37	0.01	1,132.03	0.38	-	1,139.95
-	-	-	-	-	-	-	-	-	-	-
2.00	0.33	0.30	3.63	1.28	3.45	0.00	346.76	0.12	-	349.18
10.00	3.04	2.80	22.72	8.06	82.83	0.09	8,037.52	0.73	-	8,052.79
5.00	1.42	1.30	15.26	6.42	12.66	0.01	1,151.09	0.58	-	1,163.26
5.00	0.67	0.62	7.76	2.43	7.63	0.01	790.38	0.22	-	794.99
5.00	0.65	0.60	6.85	2.80	6.14	0.01	583.53	0.25	-	588.84
2.00	0.03	0.03	14.45	0.05	2.07	-	318.59	0.42	-	327.49
6.00	0.03	0.03	5.31	0.05	2.18	-	329.30	0.43	-	338.23
3.00	0.04	0.04	21.68	0.08	3.11	-	477.89	0.64	-	491.23
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
5.00	0.15	0.14	1.11	0.53	2.49	0.00	282.38	0.00	0.00	282.52
10.00	0.21	0.19	1.86	0.16	3.32	0.00	537.03	0.00	0.00	537.22
6.00	0.01	0.01	1.47	0.04	0.02	0.01	228.55	0.01	0.01	230.98
11.00	0.03	0.02	1.98	0.14	0.18	0.00	283.44	0.03	0.03	291.89
5.00	0.90	0.80	6.61	3.12	14.73	0.02	1,673.36	0.00	0.00	1,674.21
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
6.00	0.10	0.09	0.73	0.34	1.62	0.00	184.07	0.00	0.00	184.16
8.00	0.13	0.12	0.97	0.46	2.16	0.00	245.43	0.00	0.00	245.55
-	-	-	-	-	-	-	-	-	-	-
2.00	0.03	0.03	0.24	0.11	0.54	0.00	61.36	0.00	0.00	61.39
2.00	0.03	0.03	0.24	0.11	0.54	0.00	61.36	0.00	0.00	61.39
-	-	-	-	-	-	-	-	-	-	-
305.00	0.23	0.18	16.25	1.12	1.52	0.02	2,328.59	0.23	0.21	2,398.04
430.00	**15.52**	**14.21**	**192.40**	**45.37**	**251.43**	**0.29**	**27,043.36**	**5.28**	**0.25**	**27,230.31**

Month 29 Daily Emissions (lb/day)

Quantity Mo 29	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e
1	0.13	0.12	1.36	0.56	1.15	0.00	106.81	0.05	0.00	107.88
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.48	0.44	3.40	0.85	5.32	0.01	485.81	0.08	0.00	487.42
3	0.90	0.83	5.88	1.69	10.40	0.01	830.99	0.15	0.00	834.20
3	0.69	0.64	6.29	1.56	11.99	0.01	1035.51	0.14	0.00	1038.47
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1	0.46	0.43	3.39	1.21	11.46	0.01	979.30	0.11	0.00	981.59
1	0.21	0.19	2.16	0.84	2.27	0.00	226.41	0.08	0.00	227.99
1	0.45	0.42	4.29	1.01	7.84	0.01	718.10	0.09	0.00	720.01
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.91	0.84	6.82	2.42	24.85	0.03	2411.26	0.22	0.00	2415.84
2	0.57	0.52	6.11	2.57	5.06	0.01	460.44	0.23	0.00	465.30
2	0.27	0.25	3.10	0.97	3.05	0.00	316.15	0.09	0.00	317.99
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.03	0.03	14.45	0.05	2.07	0.00	318.59	0.42	0.00	327.49
4	0.02	0.02	3.54	0.03	1.45	0.00	219.54	0.28	0.00	225.49
3	0.04	0.04	21.68	0.08	3.11	0.00	477.89	0.64	0.00	491.23
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1	0.01	0.01	0.11	0.05	0.25	0.00	27.89	0.00	0.00	27.90
1	0.02	0.01	0.12	0.06	0.27	0.00	30.68	0.00	0.00	30.69
2	0.06	0.05	0.45	0.21	0.99	0.00	112.95	0.00	0.00	113.01
7	0.14	0.13	1.30	0.11	2.32	0.00	375.92	0.00	0.00	376.06
6	0.01	0.01	1.47	0.04	0.02	0.01	228.55	0.01	0.01	230.98
11	0.03	0.02	1.98	0.14	0.18	0.00	283.44	0.03	0.03	291.89
1	0.18	0.16	1.32	0.62	2.95	0.00	334.67	0.00	0.00	334.84
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.09	0.08	0.66	0.31	1.47	0.00	167.34	0.00	0.00	167.42
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.10	0.09	0.73	0.34	1.62	0.00	184.07	0.00	0.00	184.16
8	0.13	0.12	0.97	0.46	2.16	0.00	245.43	0.00	0.00	245.55
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.03	0.03	0.24	0.11	0.54	0.00	61.36	0.00	0.00	61.39
2	0.03	0.03	0.24	0.11	0.54	0.00	61.36	0.00	0.00	61.39
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
166	0.13	0.10	8.84	0.61	0.82	0.01	1267.36	0.12	0.11	1305.16
247	**6.14**	**5.61**	**100.91**	**17.03**	**104.17**	**0.12**	**11967.80**	**2.74**	**0.15**	**12071.35**

Month 30 Daily Emissions (lb/day)

Quantity Mo 30	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.48	0.44	3.40	0.85	5.32	0.01	485.81	0.08	0.00	487.42
2	0.60	0.55	3.92	1.13	6.93	0.01	554.00	0.10	0.00	556.13
3	0.69	0.64	6.29	1.56	11.99	0.01	1035.51	0.14	0.00	1038.47
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Month 13 Daily Emissions (lb/day)

Quantity Mo 13	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e
2.00	0.26	0.24	2.72	1.13	2.29	0.00	213.61	0.10	-	215.75
-	-	-	-	-	-	-	-	-	-	-
5.00	1.21	1.11	8.51	2.13	13.29	0.01	1,214.52	0.19	-	1,218.56
5.00	1.51	1.39	9.81	2.82	17.33	0.02	1,384.99	0.25	-	1,390.33
15.00	3.47	3.19	31.44	7.80	59.93	0.06	5,177.57	0.70	-	5,192.35
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
5.00	1.06	0.97	10.80	4.18	11.37	0.01	1,132.03	0.38	-	1,139.95
-	-	-	-	-	-	-	-	-	-	-
2.00	0.33	0.30	3.63	1.28	3.45	0.00	346.76	0.12	-	349.18
10.00	3.04	2.80	22.72	8.06	82.83	0.09	8,037.52	0.73	-	8,052.79
5.00	1.42	1.30	15.26	6.42	12.66	0.01	1,151.09	0.58	-	1,163.26
5.00	0.67	0.62	7.76	2.43	7.63	0.01	790.38	0.22	-	794.99
3.00	0.39	0.36	4.11	1.68	3.68	0.00	350.12	0.15	-	353.30
2.00	0.03	0.03	14.45	0.05	2.07	-	318.59	0.42	-	327.49
6.00	0.03	0.03	5.31	0.05	2.18	-	329.30	0.43	-	338.23
3.00	0.04	0.04	21.68	0.08	3.11	-	477.89	0.64	-	491.23
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
5.00	0.15	0.14	1.11	0.53	2.49	0.00	282.38	0.00	0.00	282.52
10.00	0.21	0.19	1.86	0.16	3.32	0.00	537.03	0.00	0.00	537.22
6.00	0.01	0.01	1.47	0.04	0.02	0.01	228.55	0.01	0.01	230.98
11.00	0.03	0.02	1.98	0.14	0.18	0.00	283.44	0.03	0.03	291.89
5.00	0.90	0.80	6.61	3.12	14.73	0.02	1,673.36	0.00	0.00	1,674.21
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
6.00	0.10	0.09	0.73	0.34	1.62	0.00	184.07	0.00	0.00	184.16
8.00	0.13	0.12	0.97	0.46	2.16	0.00	245.43	0.00	0.00	245.55
-	-	-	-	-	-	-	-	-	-	-
2.00	0.03	0.03	0.24	0.11	0.54	0.00	61.36	0.00	0.00	61.39
2.00	0.03	0.03	0.24	0.11	0.54	0.00	61.36	0.00	0.00	61.39
-	-	-	-	-	-	-	-	-	-	-
357.00	0.27	0.21	19.02	1.31	1.77	0.03	2,725.60	0.27	0.24	2,806.88
480.00	**15.30**	**14.00**	**192.43**	**44.44**	**249.23**	**0.29**	**27,206.96**	**5.22**	**0.28**	**27,403.62**

Month 14 Daily Emissions (lb/day)

Quantity Mo 14	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e
2.00	0.26	0.24	2.72	1.13	2.29	0.00	213.61	0.10	-	215.75
-	-	-	-	-	-	-	-	-	-	-
5.00	1.21	1.11	8.51	2.13	13.29	0.01	1,214.52	0.19	-	1,218.56
5.00	1.51	1.39	9.81	2.82	17.33	0.02	1,384.99	0.25	-	1,390.33
15.00	3.47	3.19	31.44	7.80	59.93	0.06	5,177.57	0.70	-	5,192.35
-	-	-	-	-	-	-	-	-	-	-
1.00	0.46	0.43	3.39	1.21	11.46	0.01	979.30	0.11	-	981.59
3.00	0.64	0.58	6.48	2.51	6.82	0.01	679.22	0.23	-	683.97
1.00	0.45	0.42	4.29	1.01	7.84	0.01	718.10	0.09	-	720.01
2.00	0.33	0.30	3.63	1.28	3.45	0.00	346.76	0.12	-	349.18
10.00	3.04	2.80	22.72	8.06	82.83	0.09	8,037.52	0.73	-	8,052.79
5.00	1.42	1.30	15.26	6.42	12.66	0.01	1,151.09	0.58	-	1,163.26
5.00	0.67	0.62	7.76	2.43	7.63	0.01	790.38	0.22	-	794.99
3.00	0.39	0.36	4.11	1.68	3.68	0.00	350.12	0.15	-	353.30
5.00	0.07	0.07	36.13	0.13	5.18	-	796.49	1.06	-	818.72
6.00	0.03	0.03	5.31	0.05	2.18	-	329.30	0.43	-	338.23
5.00	0.07	0.07	36.13	0.13	5.18	-	796.49	1.06	-	818.72
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
5.00	0.15	0.14	1.11	0.53	2.49	0.00	282.38	0.00	0.00	282.52
10.00	0.21	0.19	1.86	0.16	3.32	0.00	537.03	0.00	0.00	537.22
6.00	0.01	0.01	1.47	0.04	0.02	0.01	228.55	0.01	0.01	230.98
11.00	0.03	0.02	1.98	0.14	0.18	0.00	283.44	0.03	0.03	291.89
5.00	0.90	0.80	6.61	3.12	14.73	0.02	1,673.36	0.00	0.00	1,674.21
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
6.00	0.10	0.09	0.73	0.34	1.62	0.00	184.07	0.00	0.00	184.16
8.00	0.13	0.12	0.97	0.46	2.16	0.00	245.43	0.00	0.00	245.55
-	-	-	-	-	-	-	-	-	-	-
2.00	0.03	0.03	0.24	0.11	0.54	0.00	61.36	0.00	0.00	61.39
2.00	0.03	0.03	0.24	0.11	0.54	0.00	61.36	0.00	0.00	61.39
-	-	-	-	-	-	-	-	-	-	-
341.00	0.26	0.20	18.17	1.25	1.69	0.03	2,603.44	0.25	0.23	2,681.08
469.00	**15.85**	**14.51**	**231.07**	**45.05**	**269.08**	**0.31**	**29,125.87**	**6.31**	**0.27**	**29,342.16**

Month 15 Daily Emissions (lb/day)

Quantity Mo 15	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e
2.00	0.26	0.24	2.72	1.13	2.29	0.00	213.61	0.10	-	215.75
-	-	-	-	-	-	-	-	-	-	-
5.00	1.21	1.11	8.51	2.13	13.29	0.01	1,214.52	0.19	-	1,218.56
5.00	1.51	1.39	9.81	2.82	17.33	0.02	1,384.99	0.25	-	1,390.33
15.00	3.47	3.19	31.44	7.80	59.93	0.06	5,177.57	0.70	-	5,192.35
-	-	-	-	-	-	-	-	-	-	-
1.00	0.46	0.43	3.39	1.21	11.46	0.01	979.30	0.11	-	981.59
3.00	0.64	0.58	6.48	2.51	6.82	0.01	679.22	0.23	-	683.97
1.00	0.91	0.83	8.59	2.02	15.68	0.02	1,436.20	0.18	-	1,440.03
2.00	0.33	0.30	3.63	1.28	3.45	0.00	346.76	0.12	-	349.18
10.00	3.04	2.80	22.72	8.06	82.83	0.09	8,037.52	0.73	-	8,052.79
5.00	1.42	1.30	15.26	6.42	12.66	0.01	1,151.09	0.58	-	1,163.26
5.00	0.67	0.62	7.76	2.43	7.63	0.01	790.38	0.22	-	794.99
3.00	0.39	0.36	4.11	1.68	3.68	0.00	350.12	0.15	-	353.30
6.00	0.09	0.09	43.36	0.15	6.22	-	955.78	1.27	-	982.47
6.00	0.03	0.03	5.31	0.05	2.18	-	329.30	0.43	-	338.23
8.00	0.11	0.11	57.82	0.20	8.29	-	1,274.38	1.69	-	1,309.95
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
5.00	0.15	0.14	1.11	0.53	2.49	0.00	282.38	0.00	0.00	282.52
10.00	0.21	0.19	1.86	0.16	3.32	0.00	537.03	0.00	0.00	537.22
6.00	0.01	0.01	1.47	0.04	0.02	0.01	228.55	0.01	0.01	230.98
11.00	0.03	0.02	1.98	0.14	0.18	0.00	283.44	0.03	0.03	291.89
5.00	0.90	0.80	6.61	3.12	14.73	0.02	1,673.36	0.00	0.00	1,674.21
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
6.00	0.10	0.09	0.73	0.34	1.62	0.00	184.07	0.00	0.00	184.16
8.00	0.13	0.12	0.97	0.46	2.16	0.00	245.43	0.00	0.00	245.55
-	-	-	-	-	-	-	-	-	-	-
2.00	0.03	0.03	0.24	0.11	0.54	0.00	61.36	0.00	0.00	61.39
2.00	0.03	0.03	0.24	0.11	0.54	0.00	61.36	0.00	0.00	61.39
-	-	-	-	-	-	-	-	-	-	-
347.00	0.26	0.20	18.49	1.27	1.72	0.03	2,649.25	0.26	0.24	2,728.26
480.00	**16.36**	**14.99**	**264.59**	**46.18**	**281.09**	**0.32**	**30,526.97**	**7.25**	**0.27**	**30,764.32**

Month 16 Daily Emissions (lb/day)

Quantity Mo 16	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e
2.00	0.26	0.24	2.72	1.13	2.29	0.00	213.61	0.10	-	215.75
-	-	-	-	-	-	-	-	-	-	-
5.00	1.21	1.11	8.51	2.13	13.29	0.01	1,214.52	0.19	-	1,218.56
5.00	1.51	1.39	9.81	2.82	17.33	0.02	1,384.99	0.25	-	1,390.33
15.00	3.47	3.19	31.44	7.80	59.93	0.06	5,177.57	0.70	-	5,192.35
-	-	-	-	-	-	-	-	-	-	-
1.00	0.46	0.43	3.39	1.21	11.46	0.01	979.30	0.11	-	981.59
3.00	0.64	0.58	6.48	2.51	6.82	0.01	679.22	0.23	-	683.97
1.00	0.45	0.42	4.29	1.01	7.84	0.01	718.10	0.09	-	720.01
2.00	0.33	0.30	3.63	1.28	3.45	0.00	346.76	0.12	-	349.18
10.00	3.04	2.80	22.72	8.06	82.83	0.09	8,037.52	0.73	-	8,052.79
5.00	1.42	1.30	15.26	6.42	12.66	0.01	1,151.09	0.58	-	1,163.26
5.00	0.67	0.62	7.76	2.43	7.63	0.01	790.38	0.22	-	794.99
3.00	0.39	0.36	4.11	1.68	3.68	0.00	350.12	0.15	-	353.30
6.00	0.09	0.09	43.36	0.15	6.22	-	955.78	1.27	-	982.47
6.00	0.03	0.03	5.31	0.05	2.18	-	329.30	0.43	-	338.23
6.00	0.09	0.09	43.36	0.15	6.22	-	955.78	1.27	-	982.47
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
5.00	0.15	0.14	1.11	0.53	2.49	0.00	282.38	0.00	0.00	282.52
10.00	0.21	0.19	1.86	0.16	3.32	0.00	537.03	0.00	0.00	537.22
6.00	0.01	0.01	1.47	0.04	0.02	0.01	228.55	0.01	0.01	230.98
11.00	0.03	0.02	1.98	0.14	0.18	0.00	283.44	0.03	0.03	291.89
5.00	0.90	0.80	6.61	3.12	14.73	0.02	1,673.36	0.00	0.00	1,674.21
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
6.00	0.10	0.09	0.73	0.34	1.62	0.00	184.07	0.00	0.00	184.16
8.00	0.13	0.12	0.97	0.46	2.16	0.00	245.43	0.00	0.00	245.55
-	-	-	-	-	-	-	-	-	-	-
2.00	0.03	0.03	0.24	0.11	0.54	0.00	61.36	0.00	0.00	61.39
2.00	0.03	0.03	0.24	0.11	0.54	0.00	61.36	0.00	0.00	61.39
-	-	-	-	-	-	-	-	-	-	-
332.00	0.25	0.19	17.69	1.22	1.65	0.02	2,534.73	0.25	0.23	2,610.32
462.00	**15.87**	**14.54**	**245.05**	**45.07**	**271.11**	**0.31**	**29,375.75**	**6.73**	**0.26**	**29,598.89**

Month 17 Daily Emissions (lb/day)

Quantity Mo 17	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e
2.00	0.26	0.24	2.72	1.13	2.29	0.00	213.61	0.10	-	215.75
-	-	-	-	-	-	-	-	-	-	-
5.00	1.21	1.11	8.51	2.13	13.29	0.01	1,214.52	0.19	-	1,218.56
5.00	1.51	1.39	9.81	2.82	17.33	0.02	1,384.99	0.25	-	1,390.33
15.00	3.47	3.19	31.44	7.80	59.93	0.06	5,177.57	0.70	-	5,192.35
-	-	-	-	-	-	-	-	-	-	-
1.00	0.46	0.43	3.39	1.21	11.46	0.01	979.30	0.11	-	981.59
3.00	0.64	0.58	6.48	2.51	6.82	0.01	679.22	0.23	-	683.97
1.00	0.45	0.42	4.29	1.01	7.84	0.01	718.10	0.09	-	720.01
2.00	0.33	0.30	3.63	1.28	3.45	0.00	346.76	0.12	-	349.18
10.00	3.04	2.80	22.72	8.06	82.83	0.09	8,037.52	0.73	-	8,052.79
5.00	1.42	1.30	15.26	6.42	12.66	0.01	1,151.09	0.58	-	1,163.26
5.00	0.67	0.62	7.76	2.43	7.63	0.01	790.38	0.22	-	794.99
2.00	0.26	0.24	2.74	1.12	2.46	0.00	233.41	0.10	-	235.54
6.00	0.09	0.09	43.36	0.15	6.22	-	955.78	1.27	-	982.47
6.00	0.03	0.03	5.31	0.05	2.18	-	329.30	0.43	-	338.23
5.00	0.07	0.07	36.13	0.13	5.18	-	796.49	1.06	-	818.72
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
5.00	0.15	0.14	1.11	0.53	2.49	0.00	282.38	0.00	0.00	282.52
10.00	0.21	0.19	1.86	0.16	3.32	0.00	537.03	0.00	0.00	537.22
6.00	0.01	0.01	1.47	0.04	0.02	0.01	228.55	0.01	0.01	230.98
11.00	0.03	0.02	1.98	0.14	0.18	0.00	283.44	0.03	0.03	291.89
5.00	0.90	0.80	6.61	3.12	14.73	0.02	1,673.36	0.00	0.00	1,674.21
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
6.00	0.10	0.09	0.73	0.34	1.62	0.00	184.07	0.00	0.00	184.16
8.00	0.13	0.12	0.97	0.46	2.16	0.00	245.43	0.00	0.00	245.55
-	-	-	-	-	-	-	-	-	-	-
2.00	0.03	0.03	0.24	0.11	0.54	0.00	61.36	0.00	0.00	61.39
2.00	0.03	0.03	0.24	0.11	0.54	0.00	61.36	0.00	0.00	61.39
-	-	-	-	-	-	-	-	-	-	-
325.00	0.25	0.19	17.31	1.19	1.61	0.02	2,481.29	0.24	0.22	2,555.28
453.00	**15.72**	**14.40**	**236.08**	**44.46**	**268.81**	**0.30**	**29,046.30**	**6.46**	**0.26**	**29,262.34**

Month 33 Daily Emissions (lb/day)

Quantity Mo 33	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.69	0.64	6.29	1.56	11.99	0.01	1035.51	0.14	0.00	1038.47
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.91	0.84	6.82	2.42	24.85	0.03	2411.26	0.22	0.00	2415.84
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.03	0.03	14.45	0.05	2.07	0.00	318.59	0.42	0.00	327.49
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.04	0.04	21.68	0.08	3.11	0.00	477.89	0.64	0.00	491.23
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.14	0.13	1.30	0.11	2.32	0.00	375.92	0.00	0.00	376.06
6	0.01	0.01	1.47	0.04	0.02	0.01	228.55	0.01	0.01	230.98
11	0.03	0.02	1.98	0.14	0.18	0.00	283.44	0.03	0.03	291.89
1	0.18	0.16	1.32	0.62	2.95	0.00	334.67	0.00	0.00	334.84
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.10	0.09	0.73	0.34	1.62	0.00	184.07	0.00	0.00	184.16
8	0.13	0.12	0.97	0.46	2.16	0.00	245.43	0.00	0.00	245.55
21	0.34	0.31	2.54	1.20	5.67	0.01	644.25	0.00	0.00	644.57
2	0.03	0.03	0.24	0.11	0.54	0.00	61.36	0.00	0.00	61.39
2	0.03	0.03	0.24	0.11	0.54	0.00	61.36	0.00	0.00	61.39
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
190	0.14	0.11	10.12	0.70	0.94	0.01	1450.60	0.14	0.13	1493.86
265	**2.82**	**2.55**	**70.16**	**7.94**	**58.97**	**0.08**	**8112.89**	**1.60**	**0.17**	**8197.71**

Month 34 Daily Emissions (lb/day)

Quantity Mo 34	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.69	0.64	6.29	1.56	11.99	0.01	1035.51	0.14	0.00	1038.47
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1	0.30	0.28	2.27	0.81	8.28	0.01	803.75	0.07	0.00	805.28
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.03	0.03	14.45	0.05	2.07	0.00	318.59	0.42	0.00	327.49
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.04	0.04	21.68	0.08	3.11	0.00	477.89	0.64	0.00	491.23
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.14	0.13	1.30	0.11	2.32	0.00	375.92	0.00	0.00	376.06
6	0.01	0.01	1.47	0.04	0.02	0.01	228.55	0.01	0.01	230.98
11	0.03	0.02	1.98	0.14	0.18	0.00	283.44	0.03	0.03	291.89
1	0.18	0.16	1.32	0.62	2.95	0.00	334.67	0.00	0.00	334.84
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.10	0.09	0.73	0.34	1.62	0.00	184.07	0.00	0.00	184.16
8	0.13	0.12	0.97	0.46	2.16	0.00	245.43	0.00	0.00	245.55
21	0.34	0.31	2.54	1.20	5.67	0.01	644.25	0.00	0.00	644.57
2	0.03	0.03	0.24	0.11	0.54	0.00	61.36	0.00	0.00	61.39
2	0.03	0.03	0.24	0.11	0.54	0.00	61.36	0.00	0.00	61.39
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
190	0.14	0.11	10.12	0.70	0.94	0.01	1450.60	0.14	0.13	1493.86
263	**2.21**	**1.99**	**65.61**	**6.33**	**42.40**	**0.06**	**6505.39**	**1.46**	**0.17**	**6587.15**

Month 35 Daily Emissions (lb/day)

Quantity Mo 35	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.69	0.64	6.29	1.56	11.99	0.01	1035.51	0.14	0.00	1038.47
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0

Month 18 Daily Emissions (lb/day)

Quantity Mo 18	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e
1.00	0.13	0.12	1.36	0.56	1.15	0.00	106.81	0.05	-	107.88
-	-	-	-	-	-	-	-	-	-	-
5.00	1.21	1.11	8.51	2.13	13.29	0.01	1,214.52	0.19	-	1,218.56
5.00	1.51	1.39	9.81	2.82	17.33	0.02	1,384.99	0.25	-	1,390.33
15.00	3.47	3.19	31.44	7.80	59.93	0.06	5,177.57	0.70	-	5,192.35
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
3.00	0.64	0.58	6.48	2.51	6.82	0.01	679.22	0.23	-	683.97
-	-	-	-	-	-	-	-	-	-	-
1.00	0.16	0.15	1.81	0.64	1.73	0.00	173.38	0.06	-	174.59
10.00	3.04	2.80	22.72	8.06	82.83	0.09	8,037.52	0.73	-	8,052.79
5.00	1.42	1.30	15.26	6.42	12.66	0.01	1,151.09	0.58	-	1,163.26
5.00	0.67	0.62	7.76	2.43	7.63	0.01	790.38	0.22	-	794.99
1.00	0.13	0.12	1.37	0.56	1.23	0.00	116.71	0.05	-	117.77
6.00	0.09	0.09	43.36	0.15	6.22	-	955.78	1.27	-	982.47
6.00	0.03	0.03	5.31	0.05	2.18	-	329.30	0.43	-	338.23
3.00	0.04	0.04	21.68	0.08	3.11	-	477.89	0.64	-	491.23
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
5.00	0.15	0.14	1.11	0.53	2.49	0.00	282.38	0.00	0.00	282.52
10.00	0.21	0.19	1.86	0.16	3.32	0.00	537.03	0.00	0.00	537.22
6.00	0.01	0.01	1.47	0.04	0.02	0.01	228.55	0.01	0.01	230.98
11.00	0.03	0.02	1.98	0.14	0.18	0.00	283.44	0.03	0.03	291.89
5.00	0.90	0.80	6.61	3.12	14.73	0.02	1,673.36	0.00	0.00	1,674.21
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
6.00	0.10	0.09	0.73	0.34	1.62	0.00	184.07	0.00	0.00	184.16
8.00	0.13	0.12	0.97	0.46	2.16	0.00	245.43	0.00	0.00	245.55
-	-	-	-	-	-	-	-	-	-	-
2.00	0.03	0.03	0.24	0.11	0.54	0.00	61.36	0.00	0.00	61.39
2.00	0.03	0.03	0.24	0.11	0.54	0.00	61.36	0.00	0.00	61.39
-	-	-	-	-	-	-	-	-	-	-
280.00	0.21	0.16	14.92	1.03	1.39	0.02	2,137.72	0.21	0.19	2,201.48
401.00	**14.32**	**13.11**	**207.00**	**40.26**	**243.11**	**0.28**	**26,289.86**	**5.64**	**0.23**	**26,479.20**

Month 19 Daily Emissions (lb/day)

Quantity Mo 19	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e
1.00	0.13	0.12	1.36	0.56	1.15	0.00	106.81	0.05	-	107.88
-	-	-	-	-	-	-	-	-	-	-
5.00	1.21	1.11	8.51	2.13	13.29	0.01	1,214.52	0.19	-	1,218.56
5.00	1.51	1.39	9.81	2.82	17.33	0.02	1,384.99	0.25	-	1,390.33
15.00	3.47	3.19	31.44	7.80	59.93	0.06	5,177.57	0.70	-	5,192.35
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
2.00	0.42	0.39	4.32	1.67	4.55	0.01	452.81	0.15	-	455.98
-	-	-	-	-	-	-	-	-	-	-
1.00	0.16	0.15	1.81	0.64	1.73	0.00	173.38	0.06	-	174.59
10.00	3.04	2.80	22.72	8.06	82.83	0.09	8,037.52	0.73	-	8,052.79
5.00	1.42	1.30	15.26	6.42	12.66	0.01	1,151.09	0.58	-	1,163.26
5.00	0.67	0.62	7.76	2.43	7.63	0.01	790.38	0.22	-	794.99
1.00	0.13	0.12	1.37	0.56	1.23	0.00	116.71	0.05	-	117.77
2.00	0.03	0.03	14.45	0.05	2.07	-	318.59	0.42	-	327.49
6.00	0.03	0.03	5.31	0.05	2.18	-	329.30	0.43	-	338.23
3.00	0.04	0.04	21.68	0.08	3.11	-	477.89	0.64	-	491.23
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
5.00	0.15	0.14	1.11	0.53	2.49	0.00	282.38	0.00	0.00	282.52
10.00	0.21	0.19	1.86	0.16	3.32	0.00	537.03	0.00	0.00	537.22
6.00	0.01	0.01	1.47	0.04	0.02	0.01	228.55	0.01	0.01	230.98
11.00	0.03	0.02	1.98	0.14	0.18	0.00	283.44	0.03	0.03	291.89
5.00	0.90	0.80	6.61	3.12	14.73	0.02	1,673.36	0.00	0.00	1,674.21
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
6.00	0.10	0.09	0.73	0.34	1.62	0.00	184.07	0.00	0.00	184.16
8.00	0.13	0.12	0.97	0.46	2.16	0.00	245.43	0.00	0.00	245.55
-	-	-	-	-	-	-	-	-	-	-
2.00	0.03	0.03	0.24	0.11	0.54	0.00	61.36	0.00	0.00	61.39
2.00	0.03	0.03	0.24	0.11	0.54	0.00	61.36	0.00	0.00	61.39
-	-	-	-	-	-	-	-	-	-	-
247.00	0.19	0.14	13.16	0.91	1.23	0.02	1,885.78	0.18	0.17	1,942.02
363.00	**14.03**	**12.84**	**174.18**	**39.20**	**236.53**	**0.27**	**25,174.32**	**4.70**	**0.21**	**25,336.77**

Month 20 Daily Emissions (lb/day)

Quantity Mo 20	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
5.00	1.21	1.11	8.51	2.13	13.29	0.01	1,214.52	0.19	-	1,218.56
5.00	1.51	1.39	9.81	2.82	17.33	0.02	1,384.99	0.25	-	1,390.33
15.00	3.47	3.19	31.44	7.80	59.93	0.06	5,177.57	0.70	-	5,192.35
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
2.00	0.42	0.39	4.32	1.67	4.55	0.01	452.81	0.15	-	455.98
-	-	-	-	-	-	-	-	-	-	-
1.00	0.16	0.15	1.81	0.64	1.73	0.00	173.38	0.06	-	174.59
10.00	3.04	2.80	22.72	8.06	82.83	0.09	8,037.52	0.73	-	8,052.79
5.00	1.42	1.30	15.26	6.42	12.66	0.01	1,151.09	0.58	-	1,163.26
5.00	0.67	0.62	7.76	2.43	7.63	0.01	790.38	0.22	-	794.99
1.00	0.13	0.12	1.37	0.56	1.23	0.00	116.71	0.05	-	117.77
2.00	0.03	0.03	14.45	0.05	2.07	-	318.59	0.42	-	327.49
6.00	0.03	0.03	5.31	0.05	2.18	-	329.30	0.43	-	338.23
3.00	0.04	0.04	21.68	0.08	3.11	-	477.89	0.64	-	491.23
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
5.00	0.15	0.14	1.11	0.53	2.49	0.00	282.38	0.00	0.00	282.52
10.00	0.21	0.19	1.86	0.16	3.32	0.00	537.03	0.00	0.00	537.22
6.00	0.01	0.01	1.47	0.04	0.02	0.01	228.55	0.01	0.01	230.98
11.00	0.03	0.02	1.98	0.14	0.18	0.00	283.44	0.03	0.03	291.89
5.00	0.90	0.80	6.61	3.12	14.73	0.02	1,673.36	0.00	0.00	1,674.21
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
6.00	0.10	0.09	0.73	0.34	1.62	0.00	184.07	0.00	0.00	184.16
8.00	0.13	0.12	0.97	0.46	2.16	0.00	245.43	0.00	0.00	245.55
-	-	-	-	-	-	-	-	-	-	-
2.00	0.03	0.03	0.24	0.11	0.54	0.00	61.36	0.00	0.00	61.39
2.00	0.03	0.03	0.24	0.11	0.54	0.00	61.36	0.00	0.00	61.39
-	-	-	-	-	-	-	-	-	-	-
226.00	0.17	0.13	12.04	0.83	1.12	0.02	1,725.45	0.17	0.15	1,776.91
341.00	**13.88**	**12.71**	**171.70**	**38.56**	**235.28**	**0.27**	**24,907.18**	**4.63**	**0.19**	**25,063.79**

Month 38 Daily Emissions (lb/day)

Quantity Mo 38	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1	0.23	0.21	2.10	0.52	4.00	0.00	345.17	0.05	0.00	346.16
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.09	0.09	43.36	0.15	6.22	0.00	955.78	1.27	0.00	982.47
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.04	0.04	21.68	0.08	3.11	0.00	477.89	0.64	0.00	491.23
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.04	0.04	0.37	0.03	0.66	0.00	107.41	0.00	0.00	107.44
6	0.01	0.01	1.47	0.04	0.02	0.01	228.55	0.01	0.01	230.98
11	0.03	0.02	1.98	0.14	0.18	0.00	283.44	0.03	0.03	291.89
1	0.18	0.16	1.32	0.62	2.95	0.00	334.67	0.00	0.00	334.84
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.10	0.09	0.73	0.34	1.62	0.00	184.07	0.00	0.00	184.16
8	0.13	0.12	0.97	0.46	2.16	0.00	245.43	0.00	0.00	245.55
21	0.34	0.31	2.54	1.20	5.67	0.01	644.25	0.00	0.00	644.57
2	0.03	0.03	0.24	0.11	0.54	0.00	61.36	0.00	0.00	61.39
2	0.03	0.03	0.24	0.11	0.54	0.00	61.36	0.00	0.00	61.39
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
153	0.12	0.09	8.15	0.56	0.76	0.01	1168.11	0.11	0.10	1202.95
222	**1.37**	**1.23**	**85.16**	**4.37**	**28.43**	**0.04**	**5097.48**	**2.11**	**0.14**	**5185.02**

Month 39 Daily Emissions (lb/day)

Quantity Mo 39	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1	0.23	0.21	2.10	0.52	4.00	0.00	345.17	0.05	0.00	346.16
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.09	0.09	43.36	0.15	6.22	0.00	955.78	1.27	0.00	982.47
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.04	0.04	21.68	0.08	3.11	0.00	477.89	0.64	0.00	491.23
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.04	0.04	0.37	0.03	0.66	0.00	107.41	0.00	0.00	107.44
6	0.01	0.01	1.47	0.04	0.02	0.01	228.55	0.01	0.01	230.98
11	0.03	0.02	1.98	0.14	0.18	0.00	283.44	0.03	0.03	291.89
1	0.18	0.16	1.32	0.62	2.95	0.00	334.67	0.00	0.00	334.84
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.10	0.09	0.73	0.34	1.62	0.00	184.07	0.00	0.00	184.16
8	0.13	0.12	0.97	0.46	2.16	0.00	245.43	0.00	0.00	245.55
21	0.34	0.31	2.54	1.20	5.67	0.01	644.25	0.00	0.00	644.57
2	0.03	0.03	0.24	0.11	0.54	0.00	61.36	0.00	0.00	61.39
2	0.03	0.03	0.24	0.11	0.54	0.00	61.36	0.00	0.00	61.39
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
153	0.12	0.09	8.15	0.56	0.76	0.01	1168.11	0.11	0.10	1202.95
222	**1.37**	**1.23**	**85.16**	**4.37**	**28.43**	**0.04**	**5097.48**	**2.11**	**0.14**	**5185.02**

Month 40 Daily Emissions (lb/day)

Quantity Mo 40	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1	0.23	0.21	2.10	0.52	4.00	0.00	345.17	0.05	0.00	346.16
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.09	0.09	43.36	0.15	6.22	0.00	955.78	1.27	0.00	982.47
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.04	0.04	21.68	0.08	3.11	0.00	477.89	0.64	0.00	491.23
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.04	0.04	0.37	0.03	0.66	0.00	107.41	0.00	0.00	107.44
6	0.01	0.01	1.47	0.04	0.02	0.01	228.55	0.01	0.01	230.98
11	0.03	0.02	1.98	0.14	0.18	0.00	283.44	0.03	0.03	291.89
1	0.18	0.16	1.32	0.62	2.95	0.00	334.67	0.00	0.00	334.84
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.10	0.09	0.73	0.34	1.62	0.00	184.07	0.00	0.00	184.16
8	0.13	0.12	0.97	0.46	2.16	0.00	245.43	0.00	0.00	245.55
21	0.34	0.31	2.54	1.20	5.67	0.01	644.25	0.00	0.00	644.57
2	0.03	0.03	0.24	0.11	0.54	0.00	61.36	0.00	0.00	61.39
2	0.03	0.03	0.24	0.11	0.54	0.00	61.36	0.00	0.00	61.39
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
152	0.12	0.09	8.10	0.56	0.76	0.01	1160.48	0.11	0.10	1195.09
221	**1.37**	**1.23**	**85.10**	**4.37**	**28.43**	**0.04**	**5089.85**	**2.11**	**0.14**	**5177.15**

Month 41 Daily Emissions (lb/day)

Quantity Mo 41	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1	0.23	0.21	2.10	0.52	4.00	0.00	345.17	0.05	0.00	346.16
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.09	0.09	43.36	0.15	6.22	0.00	955.78	1.27	0.00	982.47
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.04	0.04	21.68	0.08	3.11	0.00	477.89	0.64	0.00	491.23
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.04	0.04	0.37	0.03	0.66	0.00	107.41	0.00	0.00	107.44
6	0.01	0.01	1.47	0.04	0.02	0.01	228.55	0.01	0.01	230.98
11	0.03	0.02	1.98	0.14	0.18	0.00	283.44	0.03	0.03	291.89
1	0.18	0.16	1.32	0.62	2.95	0.00	334.67	0.00	0.00	334.84
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.10	0.09	0.73	0.34	1.62	0.00	184.07	0.00	0.00	184.16
8	0.13	0.12	0.97	0.46	2.16	0.00	245.43	0.00	0.00	245.55
21	0.34	0.31	2.54	1.20	5.67	0.01	644.25	0.00	0.00	644.57
2	0.03	0.03	0.24	0.11	0.54	0.00	61.36	0.00	0.00	61.39
2	0.03	0.03	0.24	0.11	0.54	0.00	61.36	0.00	0.00	61.39
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
152	0.12	0.09	8.10	0.56	0.76	0.01	1160.48	0.11	0.10	1195.09
221	**1.37**	**1.23**	**85.10**	**4.37**	**28.43**	**0.04**	**5089.85**	**2.11**	**0.14**	**5177.15**

Monthly Comparison of Construction Equipment Emissions:

Month of Contruction	Total Equipment Quantity	Daily Emissions (lb/day)									
		PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e
1	140	7.53	6.89	86.05	20.99	126.41	0.14	13240.25	2.09	0.082	13309.63
2	315	16.74	15.31	199.57	46.75	293.52	0.32	30452.99	5.11	0.164	30611.09
3	380	15.26	13.97	199.19	43.11	270.79	0.30	28791.11	5.24	0.209	28966.01
4	350	15.89	14.55	204.36	45.04	283.28	0.32	29840.58	5.42	0.189	30012.94
5	352	16.12	14.76	214.60	46.09	285.06	0.32	30015.52	5.79	0.188	30195.47
6	457	16.34	14.97	250.11	46.58	288.75	0.32	31223.78	6.83	0.256	31446.57
7	479	17.33	15.88	252.31	49.26	305.02	0.34	32837.92	6.87	0.270	33065.80
8	466	16.51	15.12	244.12	47.21	283.13	0.32	30520.95	6.69	0.263	30742.92
9	466	16.65	15.24	210.57	48.45	273.86	0.32	29320.30	5.76	0.265	29523.62
10	433	16.45	15.07	207.31	47.61	271.76	0.31	28900.06	5.69	0.246	29095.65
11	430	15.52	14.21	192.40	45.37	251.43	0.29	27043.36	5.28	0.246	27230.31
12	430	15.52	14.21	192.40	45.37	251.43	0.29	27043.36	5.28	0.246	27230.31
13	480	15.30	14.00	192.43	44.44	249.23	0.29	27206.96	5.22	0.281	27403.62
14	469	15.85	14.51	231.07	45.05	269.08	0.31	29125.87	6.31	0.270	29342.16
15	480	16.36	14.99	264.59	46.18	281.09	0.32	30526.97	7.25	0.274	30764.32
16	462	15.87	14.54	245.05	45.07	271.11	0.31	29375.75	6.73	0.264	29598.89
17	453	15.72	14.40	236.08	44.46	268.81	0.30	29046.30	6.46	0.259	29262.34
18	401	14.32	13.11	207.00	40.26	243.11	0.28	26289.86	5.64	0.228	26479.20
19	363	14.03	12.84	174.18	39.20	236.53	0.27	25174.32	4.70	0.206	25336.77
20	341	13.88	12.71	171.70	38.56	235.28	0.27	24907.18	4.63	0.191	25063.79
21	327	14.20	13.01	173.78	39.20	245.43	0.28	25835.96	4.67	0.180	25989.75
22	326	14.20	13.01	173.72	39.20	245.43	0.28	25828.32	4.67	0.179	25981.89
23	323	13.68	12.53	169.27	37.31	237.81	0.27	24985.60	4.61	0.178	25137.62
24	322	13.47	12.34	167.11	36.47	235.54	0.27	24759.19	4.53	0.178	24909.62
25	333	15.32	14.04	181.80	41.19	266.56	0.30	27588.79	4.87	0.179	27746.63
26	332	15.80	14.48	184.70	42.00	271.79	0.30	27958.35	4.96	0.179	28117.99
27	330	15.12	13.86	180.30	40.41	263.13	0.29	27215.78	4.87	0.178	27373.43
28	286	15.03	13.79	177.66	40.14	262.09	0.29	26784.95	4.84	0.150	26932.98
29	247	6.14	5.61	100.91	17.03	104.17	0.12	11967.80	2.74	0.148	12071.35
30	265	4.95	4.51	90.51	14.15	84.15	0.10	10360.22	2.36	0.149	10456.19
31	254	3.87	3.52	81.36	10.97	71.99	0.09	9228.21	2.12	0.149	9318.84
32	241	2.80	2.54	68.88	7.86	58.85	0.08	7929.66	1.58	0.149	8009.01
33	265	2.82	2.55	70.16	7.94	58.97	0.08	8112.89	1.60	0.165	8197.71
34	263	2.21	1.99	65.61	6.33	42.40	0.06	6505.39	1.46	0.165	6587.15
35	266	1.97	1.77	92.25	5.63	38.27	0.05	6338.83	2.23	0.165	6436.85
36	229	1.94	1.75	90.28	5.49	38.08	0.05	6056.34	2.20	0.140	6145.94
37	222	1.37	1.23	85.16	4.37	28.43	0.04	5097.48	2.11	0.140	5185.02
38	222	1.37	1.23	85.16	4.37	28.43	0.04	5097.48	2.11	0.140	5185.02
39	222	1.37	1.23	85.16	4.37	28.43	0.04	5097.48	2.11	0.140	5185.02
40	221	1.37	1.23	85.10	4.37	28.43	0.04	5089.85	2.11	0.139	5177.15
41	221	1.37	1.23	85.10	4.37	28.43	0.04	5089.85	2.11	0.139	5177.15
MAX VALUE (lb/day)	**480**	**17.33**	**15.88**	**264.59**	**49.26**	**305.02**	**0.34**	**32837.9**	**7.25**	**0.281**	**33065.8**

Months for Annual Contruction		Annual Emissions (ton/year)									
		PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e
1	12	2.42	2.21	31.89	6.91	41.40	0.04687	4409.99	0.86	0.0341	4438.59
2	13	2.51705	2.30472	33.27	7.22	42.99	0.04884	4591.56	0.90	0.0367	4621.82
3	14	2.50549	2.29431	33.68	7.20	42.68	0.04864	4574.31	0.91	0.0381	4605.32
4	15	2.51980	2.30763	34.53	7.24	42.81	0.04879	4596.87	0.94	0.0389	4628.70
5	16	2.51958	2.30752	35.06	7.24	42.65	0.04868	4590.83	0.96	0.0399	4623.32
6	17	2.51445	2.30280	35.34	7.22	42.44	0.04852	4578.23	0.97	0.0408	4611.18
7	18	2.48813	2.27864	34.78	7.13	41.85	0.04791	4514.09	0.95	0.0405	4546.61
8	19	2.44520	2.23923	33.76	7.00	40.96	0.04699	4414.46	0.92	0.0396	4446.13
9	20	2.41104	2.20791	32.82	6.89	40.33	0.04633	4341.48	0.90	0.0387	4372.30
10	21	2.37922	2.17881	32.34	6.77	39.97	0.04580	4296.19	0.88	0.0376	4326.36
11	22	2.34998	2.15203	31.91	6.66	39.62	0.04533	4256.25	0.87	0.0367	4285.88
12	23	2.32605	2.13026	31.61	6.56	39.45	0.04500	4229.50	0.86	0.0358	4258.68
13	24	2.29937	2.10596	31.28	6.44	39.24	0.04463	4199.81	0.85	0.0350	4228.51
14	25	2.29971	2.10652	31.14	6.40	39.46	0.04465	4204.77	0.85	0.0336	4232.97
15	26	2.29905	2.10607	30.54	6.36	39.50	0.04458	4189.60	0.83	0.0325	4217.05
16	27	2.28285	2.09132	29.44	6.28	39.27	0.04429	4146.55	0.80	0.0312	4172.97
17	28	2.27197	2.08156	28.56	6.22	39.15	0.04407	4112.87	0.77	0.0297	4138.32
18	29	2.14737	1.96730	26.81	5.86	37.01	0.04173	3890.85	0.72	0.0283	3914.83
19	30	2.02560	1.85550	25.29	5.52	34.94	0.03949	3683.76	0.68	0.0273	3706.53
20	31	1.89361	1.73433	24.09	5.16	32.80	0.03714	3476.46	0.65	0.0265	3498.30
21	32	1.74956	1.60204	22.75	4.76	30.51	0.03467	3255.76	0.61	0.0260	3276.59
22	33	1.60162	1.46612	21.40	4.35	28.09	0.03210	3025.36	0.57	0.0258	3045.29
23	34	1.44579	1.32294	20.00	3.92	25.45	0.02930	2774.16	0.53	0.0256	2793.16
24	35	1.29352	1.18299	19.00	3.51	22.85	0.02650	2531.75	0.50	0.0254	2550.05
25	36	1.14363	1.04530	18.00	3.11	20.29	0.02370	2288.61	0.47	0.0249	2306.12
26	37	0.96225	0.87873	16.74	2.63	17.19	0.02035	1996.23	0.43	0.0244	2012.82
27	38	0.77469	0.70648	15.45	2.14	14.03	0.01695	1699.04	0.39	0.0239	1714.69
28	39	0.59601	0.54234	14.21	1.67	10.98	0.01365	1411.50	0.36	0.0234	1426.24
29	40	0.41839	0.37910	13.01	1.21	7.94	0.01041	1129.46	0.32	0.0233	1143.42
30	41	0.35644	0.32216	12.80	1.04	6.95	0.00931	1040.05	0.31	0.0231	1053.79
MAX VALUE (ton/year)		**2.51980**	**2.30763**	**35.34**	**7.24**	**42.99**	**0.04884**	**4596.87**	**0.97**	**0.0408**	**4628.70**

Combustion Exhaust Emissions On-site (annual)

Maximum annual construction on-site exhausted emissions occurs in months 2-13.

Construction Assumptions - 26 days per month

Equipment	Number of Vehicles per year	Hours/Day	Emission rate per piece of equipment (lb/hr)										Annual Emissions (ton/year)										Number of Vehicles (entire construction period)	entire construction period emissions (ton)									
			PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e		PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e
Diesel Construction Equipment																																	
Air Compressor	20	5	0.027	0.025	0.283	0.118	0.239	0.000	22.251	0.011	0.000	22.474	0.03	0.03	0.35	0.15	0.30	0.00	27.77	0.01	0.00	28.05	36	0.06	0.06	0.64	0.26	0.54	0.00	49.99	0.02	0.00	50.49
Asphalt Paver	1	6	0.085	0.078	0.522	0.164	0.968	0.001	69.134	0.015	0.000	69.444	0.01	0.01	0.04	0.01	0.07	0.00	5.30	0.00	0.00	5.33	2	0.01	0.01	0.08	0.03	0.15	0.00	10.61	0.00	0.00	10.65
Backhoe	61	5	0.051	0.047	0.362	0.091	0.566	0.001	51.682	0.008	0.000	51.854	0.19	0.18	1.35	0.34	2.11	0.00	192.62	0.03	0.00	193.26	148	0.47	0.43	3.27	0.82	5.12	0.01	467.35	0.07	0.00	468.90
Compactor	50	5	0.064	0.059	0.417	0.120	0.738	0.001	58.936	0.011	0.000	59.163	0.20	0.18	1.27	0.37	2.25	0.00	180.05	0.03	0.00	180.74	137	0.54	0.49	3.49	1.00	6.17	0.01	493.33	0.09	0.00	495.24
Crane small (Hydraulic Vibrating Post Driver and	180	4	0.054	0.049	0.488	0.121	0.929	0.001	80.272	0.011	0.000	80.502	0.54	0.50	4.91	1.22	9.35	0.01	807.70	0.11	0.00	810.01	439	1.32	1.21	11.96	2.97	22.80	0.02	1969.89	0.27	0.00	1975.52
Crane large	12	6	0.068	0.063	0.662	0.182	1.771	0.002	179.940	0.016	0.000	180.284	0.06	0.06	0.62	0.17	1.66	0.00	168.98	0.02	0.00	169.31	21	0.11	0.10	1.09	0.30	2.91	0.00	295.72	0.03	0.00	296.29
Dozer	9	6	0.078	0.072	0.574	0.205	1.942	0.002	165.982	0.018	0.000	166.371	0.05	0.05	0.40	0.14	1.34	0.00	114.58	0.01	0.00	114.85	19	0.11	0.11	0.84	0.30	2.83	0.00	241.89	0.03	0.00	242.45
Generator	36	7	0.029	0.026	0.292	0.113	0.307	0.000	30.595	0.010	0.000	30.810	0.10	0.09	1.01	0.39	1.06	0.00	105.96	0.04	0.00	106.70	68	0.19	0.17	1.91	0.74	2.01	0.00	200.14	0.07	0.00	201.54
Grader	10	6	0.078	0.072	0.740	0.174	1.352	0.001	123.810	0.016	0.000	124.140	0.06	0.05	0.56	0.13	1.02	0.00	93.35	0.01	0.00	93.60	22	0.13	0.12	1.23	0.29	2.24	0.00	205.38	0.03	0.00	205.92
Light Tower	19	6	0.026	0.024	0.293	0.103	0.278	0.000	27.964	0.009	0.000	28.160	0.04	0.04	0.45	0.16	0.43	0.00	42.82	0.01	0.00	43.12	32	0.07	0.06	0.75	0.27	0.72	0.00	72.13	0.02	0.00	72.63
Loader	120	5	0.056	0.052	0.421	0.149	1.534	0.002	148.843	0.013	0.000	149.126	0.47	0.44	3.54	1.26	12.92	0.01	1253.85	0.11	0.00	1256.23	288	1.14	1.05	8.51	3.02	31.01	0.03	3009.25	0.27	0.00	3014.96
Maxi Sneeker (Trencher)	60	7	0.040	0.037	0.436	0.184	0.362	0.000	32.888	0.017	0.000	33.236	0.22	0.20	2.38	1.00	1.97	0.00	179.57	0.09	0.00	181.47	142	0.52	0.48	5.64	2.37	4.67	0.01	424.98	0.21	0.00	429.48
Skid Steer (Bobcat)	60	6	0.022	0.020	0.250	0.078	0.246	0.000	25.496	0.007	0.000	25.645	0.10	0.10	1.21	0.38	1.19	0.00	123.30	0.03	0.00	124.02	142	0.25	0.23	2.87	0.90	2.82	0.00	291.81	0.08	0.00	293.51
Welding Machine	49	5	0.029	0.027	0.304	0.124	0.273	0.000	25.935	0.011	0.000	26.171	0.08	0.08	0.87	0.36	0.78	0.00	74.34	0.03	0.00	75.02	63	0.11	0.10	1.12	0.46	1.01	0.00	95.58	0.04	0.00	96.45
Equipment fueled with Propane																																	
Aerial Lift	54	5	0.003	0.003	1.417	0.005	0.203	0.000	31.235	0.042	0.000	32.107	0.01	0.01	5.07	0.02	0.73	0.00	111.83	0.15	0.00	114.95	159	0.03	0.03	14.94	0.05	2.14	0.00	329.27	0.44	0.00	338.46
Fork Lift	72	3	0.002	0.002	0.295	0.003	0.121	0.000	18.295	0.024	0.000	18.791	0.00	0.00	0.83	0.01	0.34	0.00	51.37	0.07	0.00	52.76	176	0.01	0.01	2.02	0.02	0.83	0.00	125.57	0.16	0.00	128.98
Telehandler	35	5	0.003	0.003	1.417	0.005	0.203	0.000	31.235	0.042	0.000	32.107	0.01	0.01	3.29	0.01	0.47	0.00	72.48	0.10	0.00	74.50	131	0.02	0.02	12.31	0.04	1.76	0.00	271.28	0.36	0.00	278.86
Vehicles with Onroad Engines for Emissions Estimates																																	
Concrete Delivery Truck for general construction	12	12	0.001	0.001	0.010	0.005	0.023	0.000	2.557	0.000	0.000	2.558	0.00	0.00	0.02	0.01	0.04	0.00	4.79	0.00	0.00	4.79	14	0.00	0.00	0.02	0.01	0.05	0.00	5.58	0.00	0.00	5.59
Concrete Delivery Truck for bridge	0	12	0.001	0.001	0.009	0.004	0.020	0.000	2.324	0.000	0.000	2.325	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9	0.00	0.00	0.01	0.01	0.03	0.00	3.26	0.00	0.00	3.26
Concrete Pump Truck for bridge	0	12	0.001	0.001	0.010	0.005	0.023	0.000	2.557	0.000	0.000	2.558	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7	0.00	0.00	0.01	0.01	0.02	0.00	2.79	0.00	0.00	2.79
Dump Truck	65	12	0.003	0.002	0.019	0.009	0.041	0.000	4.706	0.000	0.000	4.709	0.03	0.02	0.19	0.09	0.42	0.00	47.72	0.00	0.00	47.75	151	0.06	0.05	0.44	0.21	0.98	0.00	110.86	0.00	0.00	110.92
Flatbed Truck	118	12	0.002	0.002	0.016	0.001	0.028	0.000	4.475	0.000	0.000	4.477	0.03	0.03	0.29	0.02	0.51	0.00	82.38	0.00	0.00	82.41	338	0.09	0.08	0.82	0.07	1.46	0.00	235.97	0.00	0.00	236.06
Staff & Security Truck	72	24	0.000	0.000	0.010	0.000	0.000	0.000	1.587	0.000	0.000	1.604	0.00	0.00	0.23	0.01	0.00	0.00	35.65	0.00	0.00	36.03	246	0.00	0.00	0.78	0.02	0.01	0.00	121.82	0.01	0.00	123.11
Pickup Truck	132	12	0.000	0.000	0.015	0.001	0.001	0.000	2.147	0.000	0.000	2.211	0.00	0.00	0.31	0.02	0.03	0.00	44.22	0.00	0.00	45.54	451	0.02	0.01	1.05	0.07	0.10	0.00	151.07	0.01	0.01	155.58
Water and Road Preparation Materials Truck	75	12	0.015	0.013	0.110	0.052	0.246	0.000	27.889	0.000	0.000	27.903	0.17	0.16	1.29	0.61	2.87	0.00	326.31	0.00	0.00	326.47	158	0.37	0.33	2.71	1.28	6.05	0.01	687.42	0.00	0.00	687.76
General Materials Delivery Truck for general cons	24	24	0.001	0.001	0.005	0.002	0.011	0.000	1.278	0.000	0.000	1.279	0.01	0.00	0.04	0.02	0.08	0.00	9.57	0.00	0.00	9.58	24	0.01	0.00	0.04	0.02	0.08	0.00	9.57	0.00	0.00	9.58
General Materials Delivery Truck for bridge	0	24	0.001	0.001	0.005	0.002	0.010	0.000	1.162	0.000	0.000	1.163	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	22	0.00	0.00	0.03	0.01	0.07	0.00	7.98	0.00	0.00	7.98
Steel Piling Delivery Truck	13	24	0.001	0.001	0.005	0.002	0.011	0.000	1.278	0.000	0.000	1.279	0.00	0.00	0.02	0.01	0.05	0.00	5.18	0.00	0.00	5.19	28	0.01	0.01	0.04	0.02	0.10	0.00	11.17	0.00	0.00	11.17
PV Panels Delivery Truck	72	24	0.001	0.001	0.005	0.002	0.011	0.000	1.278	0.000	0.000	1.279	0.02	0.01	0.11	0.05	0.25	0.00	28.71	0.00	0.00	28.73	246	0.05	0.05	0.39	0.18	0.86	0.00	98.11	0.00	0.00	98.16
Tracker Steel Delivery Truck	96	24	0.001	0.001	0.005	0.002	0.011	0.000	1.278	0.000	0.000	1.279	0.02	0.02	0.15	0.07	0.34	0.00	38.29	0.00	0.00	38.31	328	0.07	0.06	0.52	0.24	1.15	0.00	130.81	0.00	0.00	130.88
Suncatcher Delivery Truck	0	24	0.001	0.001	0.005	0.002	0.011	0.000	1.278	0.000	0.000	1.279	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	252	0.05	0.05	0.40	0.19	0.88	0.00	100.50	0.00	0.00	100.55
Electrical and Control Systems Delivery Truck	24	24	0.001	0.001	0.005	0.002	0.011	0.000	1.278	0.000	0.000	1.279	0.01	0.00	0.04	0.02	0.08	0.00	9.57	0.00	0.00	9.58	82	0.02	0.02	0.13	0.06	0.29	0.00	32.70	0.00	0.00	32.72
Tracker Delivery Truck	24	24	0.001	0.001	0.005	0.002	0.011	0.000	1.278	0.000	0.000	1.279	0.01	0.00	0.04	0.02	0.08	0.00	9.57	0.00	0.00	9.58	82	0.02	0.02	0.13	0.06	0.29	0.00	32.70	0.00	0.00	32.72
Water Delivery Trucks	0	24	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Passenger Vehicles	3463	24	0.000	0.000	0.002	0.000	0.000	0.000	0.318	0.000	0.000	0.328	0.03	0.03	2.40	0.17	0.22	0.00	343.71	0.03	0.03	353.96	9401	0.09	0.07	6.51	0.45	0.61	0.01	933.06	0.09	0.08	960.89
	5038											**Total**	**2.52**	**2.30**	**33.27**	**7.22**	**42.99**	**0.05**	**4591.56**	**0.90**	**0.04**	**4621.82**		**5.95**	**5.44**	**86.70**	**16.75**	**102.77**	**0.12**	**11229.55**	**2.31**	**0.10**	**11310.05**

Number of Vehicles per year = sum of monthly daily maximum vehicle usage for the peak 12 months
delivery trucks can arrive at the site anytime during the day or night

Calico Solar

Fugitive Dust Emissions (on-site)

To be consistent with on-site exhausted emissions, months 7 was used to represent the daily/monthly construction onsite fugitive dust emissions.
Months 2-13 was selected to represent the maximum annual construction on-site fugitive dust emissions.

Travel on sealed roads (paved)

$E = [k * (sL/2)^{0.91} * (W)^{1.02}] (1 - P/4N)$

Source: EPA AP-42 Section 13.2.1 Paved Roads Equation 2 (Jan. 2011 version)
E = particulate emission factor (lb/VMT),
k = particle size multiplier for particle size range and units of interest (lb/VMT),
7.4 sL = road surface silt loading (grams per square meter) (g/m^2), from Table 13.2.1-4 for Municipal solid waste landfill
W = average weight (tons) of the vehicles traveling the road, and

constants

	$PM_{2.5}$	PM_{10}
k	0.0024	0.016

23 P = Mean number of days per year with at least 0.01 inches of precipitation (from Daggett FAA Airport Station)
365 N = number of days in the year (averaging period)

Vehicle Type	Number of Vehicles (month 7)	Max Daily Distance per Vehicle (mile/day)	Assumed distance percentage to drive on sealed roads	Max Daily Distance per Vehicle to drive on sealed roads (mile/day)	Max Daily VMT (all vehicles)	Mean Vehicle Weight (tons)	Max. Operating Hours / Day	Number of Vehicles per year (months 2-13)	Max Annual VMT (all vehicles)	$PM_{2.5}$ EF (lbs/VMT)	PM_{10} EF (lbs/VMT)
Diesel Construction Equipment											
Air Compressor	1	0	0%	0.0	0	0.5	5	20	0	0.004	0.026
Asphalt Paver	0	0.2	0%	0.0	0	25	6	1	0	0.207	1.381
Backhoe	5	0	0%	0.0	0	11	5	61	0	0.090	0.598
Compactor	5	0	0%	0.0	0	10	5	50	0	0.081	0.542
Crane small (Hydraulic Vibrating Post Driver and	15	0.5	0%	0.0	0	10	4	180	0	0.081	0.542
Crane large	3	0.5	0%	0.0	0	35	6	12	0	0.292	1.946
Dozer	1	0	0%	0.0	0	20	6	9	0	0.165	1.100
Generator	3	0	0%	0.0	0	0.5	7	36	0	0.004	0.026
Grader	1	0	0%	0.0	0	20	6	10	0	0.165	1.100
Light Tower	2	0	0%	0.0	0	0.25	6	19	0	0.002	0.013
Loader	10	0	0%	0.0	0	25	5	120	0	0.207	1.381
Maxi Sneeker (Trencher)	5	0	0%	0.0	0	5	7	60	0	0.040	0.267
Skid Steer (Bobcat)	5	0	0%	0.0	0	2	6	60	0	0.016	0.105
Welding Machine	5	0	0%	0.0	0	0.5	5	49	0	0.004	0.026
Equipment fueled with Propane											
Aerial Lift	6	1	50%	0.5	3	4	5	54	702	0.032	0.213
Fork Lift	6	1	50%	0.5	3	3	3	72	936	0.024	0.159
Telehandler	5	1	50%	0.5	3	3	5	35	455	0.024	0.159
Vehicles with Onroad Engines for Emissions Estimates											
Concrete Delivery Truck for general construction	0	4.4	0%	0.0	0	20	12	12	0	0.165	1.100
Concrete Delivery Truck for bridge	0	4	0%	0.0	0	20	12	0	0	0.165	1.100
Concrete Pump Truck for bridge	0	4.4	0%	0.0	0	20	12	0	0	0.165	1.100
Dump Truck	5	8.1	40%	3.2	16	20	12	65	5475.6	0.165	1.100
Flatbed Truck	10	16.2	40%	6.5	65	10	12	118	19880.64	0.081	0.542
Staff & Security Truck	6	53	100%	53.0	318	2.25	24	72	99216	0.018	0.118
Pickup Truck	11	16.2	40%	6.5	71	4	12	132	22239.36	0.032	0.213
Water and Road Preparation Materials Truck	5	48	30%	14.4	72	20	12	75	28080	0.165	1.100
General Materials Delivery Truck for general cor	3	4.4	0%	0.0	0	20	24	24	0	0.165	1.100
General Materials Delivery Truck for bridge	0	4	0%	0.0	0	20	24	0	0	0.165	1.100
Steel Piling Delivery Truck	3	4.4	0%	0.0	0	20	24	13	0	0.165	1.100
PV Panels Delivery Truck	6	4.4	0%	0.0	0	20	24	72	0	0.165	1.100
Tracker Steel Delivery Truck	8	4.4	0%	0.0	0	20	24	96	0	0.165	1.100
Suncatcher Delivery Truck	0	4.4	0%	0.0	0	20	24	0	0	0.165	1.100
Electrical and Control Systems Delivery Truck	2	4.4	0%	0.0	0	20	24	24	0	0.165	1.100
Tracker Delivery Truck	2	4.4	0%	0.0	0	20	24	24	0	0.165	1.100
Water Delivery Trucks	0	0	0%	0.0	0	0	24	0	0	0.000	0.000
Worker Passenger Vehicles	340	4.8	10%	0.5	163	2	24	3463	43218.24	0.016	0.105

Vehicle Type	Watering Control Efficiency		PM_{10} Emissions (lb/hr)		PM_{10} Emissions (lb/day)		% of daily emissions	PM_{10} Emissions (tons/year)		$PM_{2.5}$ Emissions (lb/hr)		$PM_{2.5}$ Emissions (lb/day)		$PM_{2.5}$ Emissions (tons/year)	
	Unmitigated	Mitigated	Unmitigated	Mitigated	Unmitigated	Mitigated		Unmitigated	Mitigated	Unmitigated	Mitigated	Unmitigated	Mitigated	Unmitigated	Mitigated
Diesel Construction Equipment															
Air Compressor	0%	0%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Paver	0%	0%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Backhoe	0%	0%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Compactor	0%	0%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Crane small (Hydraulic Vibrating Post Driver and	0%	0%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Crane large	0%	0%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dozer	0%	0%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Generator	0%	0%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grader	0%	0%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Tower	0%	0%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Loader	0%	0%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maxi Sneeker (Trencher)	0%	0%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Skid Steer (Bobcat)	0%	0%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Welding Machine	0%	0%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Equipment fueled with Propane															
Aerial Lift	0%	0%	0.13	0.13	0.64	0.64	0.31%	0.07	0.07	0.02	0.02	0.10	0.10	0.01	0.01
Fork Lift	0%	0%	0.16	0.16	0.48	0.48	0.23%	0.07	0.07	0.02	0.02	0.07	0.07	0.01	0.01
Telehandler	0%	0%	0.08	0.08	0.40	0.40	0.19%	0.04	0.04	0.01	0.01	0.06	0.06	0.01	0.01
Vehicles with Onroad Engines for Emissions Estimates															
Concrete Delivery Truck for general construction	0%	0%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Concrete Delivery Truck for bridge	0%	0%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Concrete Pump Truck for bridge	0%	0%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dump Truck	0%	0%	1.48	1.48	17.82	17.82	8.75%	3.01	3.01	0.22	0.22	2.67	2.67	0.45	0.45
Flatbed Truck	0%	0%	2.93	2.93	35.14	35.14	17.26%	5.39	5.39	0.44	0.44	5.27	5.27	0.81	0.81
Staff & Security Truck	0%	0%	1.57	1.57	37.67	37.67	18.49%	5.88	5.88	0.24	0.24	5.65	5.65	0.88	0.88
Pickup Truck	0%	0%	1.27	1.27	15.18	15.18	7.46%	2.37	2.37	0.19	0.19	2.28	2.28	0.36	0.36
Water and Road Preparation Materials Truck	0%	0%	6.60	6.60	79.19	79.19	38.88%	15.44	15.44	0.99	0.99	11.88	11.88	2.32	2.32
General Materials Delivery Truck for general cor	0%	0%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Materials Delivery Truck for bridge	0%	0%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Steel Piling Delivery Truck	0%	0%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PV Panels Delivery Truck	0%	0%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tracker Steel Delivery Truck	0%	0%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Suncatcher Delivery Truck	0%	0%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Electrical and Control Systems Delivery Truck	0%	0%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tracker Delivery Truck	0%	0%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water Delivery Trucks	0%	0%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Passenger Vehicles	0%	0%	0.71	0.71	17.14	17.14	8.42%	2.27	2.27	0.11	0.11	2.57	2.57	0.34	0.34
TOTAL Fugitive emissions for vehicles traveled on sealed road (paved)			**14.92**	**14.92**	**203.66**	**203.66**		**34.54**	**34.54**	**2.24**	**2.24**	**30.55**	**30.55**	**5.18**	**5.18**

Travel on paved road

$E = [k * (sL/2)^{0.91} * (W)^{1.02}] (1 - P/4N)$

Source: EPA AP-42 Section 13.2.1 Paved Roads Equation 2 (Jan. 2011 version)
E = particulate emission factor (lb/VMT),
k = particle size multiplier for particle size range and units of interest (lb/VMT),
1.6 sL = road surface silt loading (grams per square meter) (g/m^2), Rural roads CARB - Emission Inventory Database - Section 7.8 SJV - Entrained Paved Road Dust - Rural Roads
W = average weight (tons) of the vehicles traveling the road, and

constants

	$PM_{2.5}$	PM_{10}
k	0.0024	0.016

23 P = Mean number of days per year with at least 0.01 inches of precipitation (from Daggett FAA Airport Station)
365 N = number of days in the year (averaging period)

Vehicle Type	Number of Vehicles (month 7)	Max Daily Distance per Vehicle (mile/day)	Assumed distance percentage to drive on paved road	Max Daily Distance per Vehicle to drive on paved road (mile/day)	Max Daily VMT (all vehicles)	Mean Vehicle Weight (tons)	Max. Operating Hours / Day	Number of Vehicles per year (months 2-13)	Max Annual VMT (all vehicles)	$PM_{2.5}$ EF (lbs/VMT)	PM_{10} EF (lbs/VMT)
Diesel Construction Equipment											
Air Compressor	1	0	0%	0	0	0.5	5	20	0	0.001	0.006
Asphalt Paver	0	0.2	0%	0	0	25	6	1	0	0.051	0.343
Backhoe	5	0	0%	0	0	11	5	61	0	0.022	0.148
Compactor	5	0	0%	0	0	10	5	50	0	0.020	0.135
Crane small	15	0.5	0%	0	0	10	4	180	0	0.020	0.135
Crane large	3	0.5	0%	0	0	35	6	12	0	0.072	0.483
Dozer	1	0	0%	0	0	20	6	9	0	0.041	0.273
Generator	3	0	0%	0	0	0.5	7	36	0	0.001	0.006
Grader	1	0	0%	0	0	20	6	10	0	0.041	0.273
Light Tower	2	0	0%	0	0	0.25	6	19	0	0.000	0.003
Loader	10	0	0%	0	0	25	5	120	0	0.051	0.343
Maxi Sneeker (Trencher)	5	0	0%	0	0	5	7	60	0	0.010	0.066
Skid Steer (Bobcat)	5	0	0%	0	0	2	6	60	0	0.004	0.026
Welding Machine	5	0	0%	0	0	0.5	5	49	0	0.001	0.006
Equipment fueled with Propane											
Aerial Lift	6	1	0%	0	0	4	5	54	0	0.008	0.053
Fork Lift	6	1	0%	0	0	3	3	72	0	0.006	0.039
Telehandler	5	1	0%	0	0	3	5	35	0	0.006	0.039
Vehicles with Onroad Engines for Emissions Estimates											
Concrete Delivery Truck for general construction	0	4.4	100%	4.4	0	20	12	12	1372.8	0.041	0.273
Concrete Delivery Truck for bridge	0	4	100%	4	0	20	12	0	0	0.041	0.273
Concrete Pump Truck for bridge	0	4.4	100%	4.4	0	20	12	0	0	0.041	0.273
Dump Truck	5	8.1	50%	4.05	20	20	12	65	6844.5	0.041	0.273
Flatbed Truck	10	16.2	50%	8.1	81	10	12	118	24850.8	0.020	0.135
Staff & Security Truck	6	53	0%	0	0	2.25	24	72	0	0.004	0.029
Pickup Truck	11	16.2	50%	8.1	89	4	12	132	27799.2	0.008	0.053
Water and Road Preparation Materials Truck	5	48	10%	4.8	24	20	12	75	9360	0.041	0.273
General Materials Delivery Truck for general cor	3	4.4	100%	4.4	13	20	24	24	2745.6	0.041	0.273
General Materials Delivery Truck for bridge	0	4	100%	4	0	20	24	0	0	0.041	0.273
Steel Piling Delivery Truck	3	4.4	100%	4.4	13	20	24	13	1487.2	0.041	0.273
PV Panels Delivery Truck	6	4.4	100%	4.4	26	20	24	72	8236.8	0.041	0.273
Tracker Steel Delivery Truck	8	4.4	100%	4.4	35	20	24	96	10982.4	0.041	0.273
Suncatcher Delivery Truck	0	4.4	100%	4.4	0	20	24	0	0	0.041	0.273
Electrical and Control Systems Delivery Truck	2	4.4	100%	4.4	9	20	24	24	2745.6	0.041	0.273
Tracker Delivery Truck	2	4.4	100%	4.4	9	20	24	24	2745.6	0.041	0.273
Water Delivery Trucks	0	0	100%	0	0	0	24	0	0	0.000	0.000
Worker Passenger Vehicles	340	4.8	90%	4.32	1469	2	24	3463	388964.16	0.004	0.026

Vehicle Type	Watering Control Efficiency		PM_{10} Emissions (lb/hr)		PM_{10} Emissions (lb/day)		% of daily emissions	PM_{10} Emissions (tons/year)		$PM_{2.5}$ Emissions (lb/hr)		$PM_{2.5}$ Emissions (lb/day)		$PM_{2.5}$ Emissions (tons/year)	
	Unmitigated	Mitigated	Unmitigated	Mitigated	Unmitigated	Mitigated		Unmitigated	Mitigated	Unmitigated	Mitigated	Unmitigated	Mitigated	Unmitigated	Mitigated
Diesel Construction Equipment															
Air Compressor	0%	0%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Paver	0%	0%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Backhoe	0%	0%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Compactor	0%	0%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Crane small	0%	0%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Crane large	0%	0%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dozer	0%	0%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Generator	0%	0%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grader	0%	0%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Tower	0%	0%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Loader	0%	0%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maxi Sneeker (Trencher)	0%	0%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Skid Steer (Bobcat)	0%	0%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Welding Machine	0%	0%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Equipment fueled with Propane															
Aerial Lift	0%	0%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fork Lift	0%	0%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Telehandler	0%	0%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vehicles with Onroad Engines for Emissions Estimates															
Concrete Delivery Truck for general construction	0%	0%	0.00	0.00	0.00	0.00	0.00%	0.19	0.19	0.00	0.00	0.00	0.00	0.03	0.03
Concrete Delivery Truck for bridge	0%	0%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Concrete Pump Truck for bridge	0%	0%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dump Truck	0%	0%	0.46	0.46	5.53	5.53	5.83%	0.93	0.93	0.07	0.07	0.83	0.83	0.14	0.14
Flatbed Truck	0%	0%	0.91	0.91	10.90	10.90	11.50%	1.67	1.67	0.14	0.14	1.64	1.64	0.25	0.25
Staff & Security Truck	0%	0%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pickup Truck	0%	0%	0.39	0.39	4.71	4.71	4.97%	0.73	0.73	0.06	0.06	0.71	0.71	0.11	0.11
Water and Road Preparation Materials Truck	0%	0%	0.55	0.55	6.55	6.55	6.91%	1.28	1.28	0.08	0.08	0.98	0.98	0.19	0.19
General Materials Delivery Truck for general cor	0%	0%	0.15	0.15	3.60	3.60	3.80%	0.37	0.37	0.02	0.02	0.54	0.54	0.06	0.06
General Materials Delivery Truck for bridge	0%	0%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Steel Piling Delivery Truck	0%	0%	0.15	0.15	3.60	3.60	3.80%	0.20	0.20	0.02	0.02	0.54	0.54	0.03	0.03
PV Panels Delivery Truck	0%	0%	0.30	0.30	7.21	7.21	7.60%	1.12	1.12	0.05	0.05	1.08	1.08	0.17	0.17
Tracker Steel Delivery Truck	0%	0%	0.40	0.40	9.61	9.61	10.13%	1.50	1.50	0.06	0.06	1.44	1.44	0.22	0.22
Suncatcher Delivery Truck	0%	0%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Electrical and Control Systems Delivery Truck	0%	0%	0.10	0.10	2.40	2.40	2.53%	0.37	0.37	0.02	0.02	0.36	0.36	0.06	0.06
Tracker Delivery Truck	0%	0%	0.10	0.10	2.40	2.40	2.53%	0.37	0.37	0.02	0.02	0.36	0.36	0.06	0.06
Water Delivery Trucks	0%	0%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Passenger Vehicles	0%	0%	1.60	1.60	38.29	38.29	40.39%	5.07	5.07	0.24	0.24	5.74	5.74	0.76	0.76
TOTAL Fugitive emissions for vehicles traveled on paved road			**5.10**	**5.10**	**94.80**	**94.80**		**13.83**	**13.83**	**0.77**	**0.77**	**14.22**	**14.22**	**2.07**	**2.07**

Travel on unpaved surfaces

$E = k * (s/12)^a * (W/3)^b * [(365 - P)/365]$

EPA AP-42 Section 13.2.2 Unpaved Roads Equations 1a and 2
E = size-specific emission factor (lb/VMT)
k, a, b = empirical constants
8.5 s = surface material silt content (%)
W = mean vehicle weight (tons)

Construction sites - Scraper routes

constants

	$PM_{2.5}$	PM_{10}
k	0.15	1.5
a	0.9	0.9
b	0.45	0.45

Industrial Roads

23 P = Mean number of days per year with at least 0.01 inches of precipitation (from Daggett FAA Airport Station)

Vehicle Type	Number of Vehicles (month 7)	Max Daily Distance per Vehicle (mile/day)	Assumed distance percentage to drive on unpaved roads	Max Daily Distance per Vehicle to drive on unpaved roads (mile/day)	Max Daily VMT (all vehicles)	Mean Vehicle Weight (tons)	Max. Operating Hours / Day	Number of Vehicles per year (months 2-13)	Max Annual VMT (all vehicles)	$PM_{2.5}$ EF (lbs/VMT)	PM_{10} EF (lbs/VMT)
Diesel Construction Equipment											
Air Compressor	1	0	100%	0	0	0.5	5	20	0	0.046	0.460
Asphalt Paver	0	0.2	100%	0.2	0	25	6	1	5.2	0.268	2.676
Backhoe	5	0	100%	0	0	11	5	61	0	0.185	1.849
Compactor	5	0	100%	0	0	10	5	50	0	0.177	1.771
Crane small (Hydraulic Vibrating Post Driver and	15	0.5	100%	0.5	8	10	4	180	2340	0.177	1.771
Crane large	3	0.5	100%	0.5	2	35	6	12	156	0.311	3.113
Dozer	1	0	100%	0	0	20	6	9	0	0.242	2.420
Generator	3	0	100%	0	0	0.5	7	36	0	0.046	0.460
Grader	1	0	100%	0	0	20	6	10	0	0.242	2.420
Light Tower	2	0	100%	0	0	0.25	6	19	0	0.034	0.337
Loader	10	0	100%	0	0	25	5	120	0	0.268	2.676
Maxi Sneeker (Trencher)	5	0	100%	0	0	5	7	60	0	0.130	1.297
Skid Steer (Bobcat)	5	0	100%	0	0	2	6	60	0	0.086	0.859
Welding Machine	5	0	100%	0	0	0.5	5	49	0	0.046	0.460
Equipment fueled with Propane											
Aerial Lift	6	1	50%	0.5	3	4	5	54	702	0.117	1.173
Fork Lift	6	1	50%	0.5	3	3	3	72	936	0.103	1.030
Telehandler	5	1	50%	0.5	3	3	5	35	455	0.103	1.030
Vehicles with Onroad Engines for Emissions Estimates											
Concrete Delivery Truck for general construction	0	4.4	0%	0	0	20	12	12	0	0.242	2.420
Concrete Delivery Truck for bridge	0	4	0%	0	0	20	12	0	0	0.242	2.420
Concrete Pump Truck for bridge	0	4.4	0%	0	0	20	12	0	0	0.242	2.420
Dump Truck	5	8.1	10%	0.81	4	20	12	65	1368.9	0.242	2.420
Flatbed Truck	10	16.2	10%	1.62	16	10	12	118	4970.16	0.177	1.771
Staff & Security Truck	6	53	0%	0	0	2.25	24	72	0	0.091	0.905
Pickup Truck	11	16.2	10%	1.62	18	4	12	132	5559.84	0.117	1.173
Water and Road Preparation Materials Truck	5	48	60%	28.8	144	20	12	75	56160	0.242	2.420
General Materials Delivery Truck for general cor	3	4.4	0%	0	0	20	24	24	0	0.242	2.420
General Materials Delivery Truck for bridge	0	4	0%	0	0	20	24	0	0	0.242	2.420
Steel Piling Delivery Truck	3	4.4	0%	0	0	20	24	13	0	0.242	2.420
PV Panels Delivery Truck	6	4.4	0%	0	0	20	24	72	0	0.242	2.420
Tracker Steel Delivery Truck	8	4.4	0%	0	0	20	24	96	0	0.242	2.420
Suncatcher Delivery Truck	0	4.4	0%	0	0	20	24	0	0	0.242	2.420
Electrical and Control Systems Delivery Truck	2	4.4	0%	0	0	20	24	24	0	0.242	2.420
Tracker Delivery Truck	2	4.4	0%	0	0	20	24	24	0	0.242	2.420
Water Delivery Trucks	0	0	0%	0	0	0	24	0	0	0.000	0.000
Worker Passenger Vehicles	340	4.8	0%	0	0	2	24	3463	0	0.086	0.859

Vehicle Type	Watering Control Efficiency		PM_{10} Emissions (lb/hr)		PM_{10} Emissions (lb/day)		% of daily emissions	PM_{10} Emissions (tons/year)		$PM_{2.5}$ Emissions (lb/hr)		$PM_{2.5}$ Emissions (lb/day)		$PM_{2.5}$ Emissions (tons/year)	
	Unmitigated	Mitigated	Unmitigated	Mitigated	Unmitigated	Mitigated		Unmitigated	Mitigated	Unmitigated	Mitigated	Unmitigated	Mitigated	Unmitigated	Mitigated
Diesel Construction Equipment															
Air Compressor	0%	83%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Paver	0%	83%	0.00	0.00	0.00	0.00	0.00%	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Backhoe	0%	83%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Compactor	0%	83%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Crane small (Hydraulic Vibrating Post Driver and	0%	83%	3.09	0.53	13.29	2.26	3.05%	2.07	0.35	0.31	0.05	1.33	0.23	0.21	0.04
Crane large	0%	83%	0.78	0.13	4.67	0.79	1.07%	0.24	0.04	0.08	0.01	0.47	0.08	0.02	0.00
Dozer	0%	83%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Generator	0%	83%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grader	0%	83%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Tower	0%	83%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Loader	0%	83%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maxi Sneeker (Trencher)	0%	83%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Skid Steer (Bobcat)	0%	83%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Welding Machine	0%	83%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Equipment fueled with Propane															
Aerial Lift	0%	83%	0.69	0.12	3.52	0.60	0.81%	0.41	0.07	0.07	0.01	0.35	0.06	0.04	0.01
Fork Lift	0%	83%	1.03	0.18	3.09	0.53	0.71%	0.48	0.08	0.10	0.02	0.31	0.05	0.05	0.01
Telehandler	0%	83%	0.51	0.09	2.58	0.44	0.59%	0.23	0.04	0.05	0.01	0.26	0.04	0.02	0.00
Vehicles with Onroad Engines for Emissions Estimates															
Concrete Delivery Truck for general construction	0%	83%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Concrete Delivery Truck for bridge	0%	83%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Concrete Pump Truck for bridge	0%	83%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dump Truck	0%	83%	0.82	0.14	9.80	1.67	2.25%	1.66	0.28	0.08	0.01	0.98	0.17	0.17	0.03
Flatbed Truck	0%	83%	2.39	0.41	28.70	4.88	6.60%	4.40	0.75	0.24	0.04	2.87	0.49	0.44	0.07
Staff & Security Truck	0%	83%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pickup Truck	0%	83%	1.74	0.30	20.90	3.55	4.80%	3.26	0.55	0.17	0.03	2.09	0.36	0.33	0.06
Water and Road Preparation Materials Truck	0%	83%	29.04	4.94	348.47	59.24	80.11%	67.95	11.55	2.90	0.49	34.85	5.92	6.80	1.16
General Materials Delivery Truck for general cor	0%	83%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Materials Delivery Truck for bridge	0%	83%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Steel Piling Delivery Truck	0%	83%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PV Panels Delivery Truck	0%	83%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tracker Steel Delivery Truck	0%	83%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Suncatcher Delivery Truck	0%	83%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Electrical and Control Systems Delivery Truck	0%	83%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tracker Delivery Truck	0%	83%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water Delivery Trucks	0%	83%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Passenger Vehicles	0%	83%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL Fugitive emissions for vehicles traveled on unpaved surfaces			**40.08**	**6.81**	**435.01**	**73.95**		**80.72**	**13.72**	**4.01**	**0.68**	**43.50**	**7.40**	**8.07**	**1.37**

Note:

1. It is assumed the project will do watering every 3 hours and limit the onsite vehicle speed to less than 15 mph to mitigate the fugitive dust.
2. "Watering Control Efficiency" and "Limit Maximum Speed Control Efficiency" for unpaved road from SCAQMD CEQA Handbook 2007 - Mitigation Measures and Control Efficiencies (http://www.aqmd.gov/CEQA/handbook/mitigation/fugitive/MM_fugitive.html) - 61% from watering every 3 hours, 57% from limiting speeds to 15 mph, and 83% [=1-(1-0.61)*(1-0.57)] from doing these two mitigation together.

Bulldozing & grading EPA AP-42 Section 11.9

$E = p * 1 * s^{1.5} / M^{1.4}$ PM10 Emissions from bulldozing (lb/hr) Table 11.9-1 EMISSION FACTOR EQUATIONS FOR UNCONTROLLED OPEN DUST SOURCES AT WESTERN SURFACE COAL MINES (Overburden)

0.75 p = particle size multiplier for PM10
6.9 s = Silt content (%) (from Table 11.9-3 for bulldozers overburden)
7.9 M = Moisture content of surface material (%) (from Table 11.9-3 for bulldozers overburden)
0.75 lb/hr of PM10

$E = p * 5.7 * s^{1.2} / M^{1.3}$ PM2.5 Emissions from bulldozing (lb/hr) Table 11.9-1 EMISSION FACTOR EQUATIONS FOR UNCONTROLLED OPEN DUST SOURCES AT WESTERN SURFACE COAL MINES (Overburden)

0.105 p = particle size multiplier for PM2.5
6.9 s = Silt content (%) (from Table 11.9-3 for bulldozers overburden)
7.9 M = Moisture content of surface material (%) (from Table 11.9-3 for bulldozers overburden)
0.41 lb/hr of PM2.5

$E = p * 0.051 * S^{2.0}$ PM10 Emissions from grading (lb/VMT) Table 11.9-1 EMISSION FACTOR EQUATIONS FOR UNCONTROLLED OPEN DUST SOURCES AT WESTERN SURFACE COAL MINES (Overburden)

0.6 p = particle size multiplier for PM10
7.1 S = mean vehicle speed (mph) (from Table 11.9-3 for grader)
1.54 lb/VMT of PM10

$E = p * 0.040 * S^{2.5}$ PM2.5 Emissions from grading (lb/VMT) Table 11.9-1 EMISSION FACTOR EQUATIONS FOR UNCONTROLLED OPEN DUST SOURCES AT WESTERN SURFACE COAL MINES (Overburden)

0.031 p = particle size multiplier for PM2.5
7.1 S = mean vehicle speed (mph) (from Table 11.9-3 for grader)
0.17 lb/VMT of PM2.5

Equipment	Quantity/ month	Hours/ Day	VMT/day/ vehicle	Watering Control Efficiency	PM10 Emissions (lb/day)	PM2.5 Emissions (lb/day)	Number of Vehicles per year (months 2-13)	VMT/year/ vehicle	PM10 Emissions (ton/yr)	PM2.5 Emissions (ton/yr)
Compactor	5	5	2	83%	2.62	0.28	50	2600	0.341	0.037
Dozer	1	6		83%	0.76	0.42	9		0.088	0.049
Maxi Sneeker (Trencher)	5	7	2	83%	2.62	0.28	60	3120	0.409	0.044
Grader	1	6	4	83%	1.05	0.11	10	1040	0.136	0.015
Skid Steer (Bobcat)	5	6		83%	3.97	2.18	60		0.619	0.340
				Grading Total	**6.29**	**0.68**			**0.89**	**0.10**
				Bulldozing Total	**4.72**	**2.60**			**0.71**	**0.39**
				Total	**11.02**	**3.28**			**1.59**	**0.48**

12 months of earth work
10 total construction hours per work day
26 construction days per month

Watering every 3 hours and limit the onsite vehicle speed to less than 15 mph to mitigate the fugitive dust.

Dirt Piling or Material Handling PM10 Emissions from Material Handling (lb/ton) from EPA AP-42 Chapter 13.2.4 Eq. 1

$E = k * 0.0032 * (U/5)^{1.3} / (M/2)^{1.4}$ E = Emission factor (lb/ton material handled)

7.45 U = Mean Wind speed (mph) (from 1991-1995 Imperial Co. airport data)
12 M = Moisture content of surface material (%) (from Table 13.2.4-1 for cover at municipal landfill)

	$PM_{2.5}$	PM_{10}
k	0.053	0.35

0.00002 lb/ton of PM2.5
0.00015 lb/ton of PM10

Equipment	Quantity/ month	Hours/ Day	Material Handled per Day (ton)	Watering Control Efficiency	PM10 Emissions (lb/day)	PM2.5 Emissions (lb/day)	Number of Vehicles per year (months 2-13)	Material Handled per year (ton)	PM10 Emissions (ton/yr)	PM2.5 Emissions (ton/yr)
Backhoe	5	5	822	83%	0.0214	0.0032	61	512885.925	0.007	0.001
Loader	10	5	822	83%	0.0214	0.0032	120	512885.925	0.007	0.001
Dump Truck	5	12	1,644	83%	0.0428	0.0065	0	1,025,772	0.013	0.002
				Total	**0.09**	**0.01**			**0.03**	**0.00**

Watering every 3 hours and limit the onsite vehicle speed to less than 15 mph to mitigate the fugitive dust.

Assume 50% soil movement from loaders and 50% from backhoes

1,182 yd3/day (approximately 1/2 of the soil movement will be done in this year based on the revised project d 1,644 ton/day
737,700 yd3/project 2781 density of soil (lb/yd3) 1,025,772 tons/project
(USDA NRCS Physical Soil Properties from Imperial County
total project for Niland Fine Sand and Rositas Fine Sand soil)
737,700.00 cubic yds cut based on the revised project description.
2,812.30 total acres disturbed as described based on the revised project description.
only a small portion of this soil is picked up and moved via dump druck

Cover Storage Pile

E = 1.7 * G/1.5 * (365-H)/235 * I/15 * J SCAQMD Table A9-9-E

PM10 Emission factor from wind erosion of storage piles per day per acre

15 G = Silt content (%) (from CEQA Handbook Table A9-9-E-1 for blended ore and dirt)
23 H = Number of days with >= 0.01 inches of precipitation per year (from Daggett FAA Airport Station)
34 I = Percentage of time that the unobstructed wind speed exceeds 12 mph at mean pile height
0.5 J = Fraction of TSP that is PM10 = 0.5
28.039 lb/acre/day

wind speed percentage based on 2005 wind speed data as recorded at Daggett FAA Airport station

Source	Quantity	Size of Pile (acre)	Hours/Day	Days/Year per Pile	Watering Control Efficiency	PM10 Emissions (lb/day)	PM2.5 Emissions (lb/day)	PM10 Emissions (tons/yr)	PM2.5 Emissions (tons/yr)
Cover Storage Pile	2	1	24	182.5	83%	9.53	2.12	0.87	0.19

Watering every 3 hours and limit the onsite vehicle speed to less than 15 mph to mitigate the fugitive dust.
pile size assumed
piles present only for 6 months

Construction on-site fugitive dust PM10

Vehicle Type	Number of Vehicles (month 7)	Max Daily Distance per Vehicle (mile/day)	Month 7 construction on-site fugitive dust: Sealed Road - PM_{10} Fugitive Emissions	Paved Road - PM_{10} Fugitive Emissions	Unpaved Road - PM_{10} Fugitive Emissions	Earthmoving Equipment - PM_{10} Fugitive Emissions	Total PM_{10} Fugitive Emissions	Months 2-13 construction on-site fugitive dust: Sealed Road - PM_{10} Fugitive Emissions	Paved Road - PM_{10} Fugitive Emissions	Unpaved Road - PM_{10} Fugitive Emissions	Earthmoving Equipment - PM_{10} Fugitive Emissions	Total PM_{10} Fugitive Emissions
			lb/day					ton/year				
Diesel Construction Equipment												
Air Compressor	1	0	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00
Asphalt Paver	0	0.2	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00
Backhoe	5	0	0.00	0.00	0.00	0.02	0.02	0.00	0.00	0.00	0.01	0.01
Compactor	5	0	0.00	0.00	0.00	2.62	2.62	0.00	0.00	0.00	0.34	0.34
Crane small (Hydraulic Vibrating Post Driver and	15	0.5	0.00	0.00	2.26		2.26	0.00	0.00	0.35		0.35
Crane large	3	0.5	0.00	0.00	0.79		0.79	0.00	0.00	0.04		0.04
Dozer	1	0	0.00	0.00	0.00	0.76	0.76	0.00	0.00	0.00	0.09	0.09
Generator	3	0	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00
Grader	1	0	0.00	0.00	0.00	1.05	1.05	0.00	0.00	0.00	0.14	0.14
Light Tower	2	0	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00
Loader	10	0	0.00	0.00	0.00	0.02	0.02	0.00	0.00	0.00	0.01	0.01
Maxi Sneeker (Trencher)	5	0	0.00	0.00	0.00	2.62	2.62	0.00	0.00	0.00	0.41	0.41
Skid Steer (Bobcat)	5	0	0.00	0.00	0.00	3.97	3.97	0.00	0.00	0.00	0.62	0.62
Welding Machine	5	0	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00
Equipment fueled with Propane												
Aerial Lift	6	1	0.64	0.00	0.60		1.24	0.07	0.00	0.07		0.14
Fork Lift	6	1	0.48	0.00	0.53		1.00	0.07	0.00	0.08		0.16
Telehandler	5	1	0.40	0.00	0.44		0.84	0.04	0.00	0.04		0.08
Vehicles with Onroad Engines for Emissions Estimates												
Concrete Delivery Truck for general construction	0	4.4	0.00	0.00	0.00		0.00	0.00	0.19	0.00		0.19
Concrete Delivery Truck for bridge	0	4	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00
Concrete Pump Truck for bridge	0	4.4	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00
Dump Truck	5	8.1	17.82	5.53	1.67	0.04	25.05	3.01	0.93	0.28	0.01	4.24
Flatbed Truck	10	16.2	35.14	10.90	4.88		50.93	5.39	1.67	0.75		7.81
Staff & Security Truck	6	53	37.67	0.00	0.00		37.67	5.88	0.00	0.00		5.88
Pickup Truck	11	16.2	15.18	4.71	3.55		23.45	2.37	0.73	0.55		3.66
Water and Road Preparation Materials Truck	5	48	79.19	6.55	59.24		144.98	15.44	1.28	11.55		28.27
General Materials Delivery Truck for general cor	3	4.4	0.00	3.60	0.00		3.60	0.00	0.37	0.00		0.37
General Materials Delivery Truck for bridge	0	4	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00
Steel Piling Delivery Truck	3	4.4	0.00	3.60	0.00		3.60	0.00	0.20	0.00		0.20
PV Panels Delivery Truck	6	4.4	0.00	7.21	0.00		7.21	0.00	1.12	0.00		1.12
Tracker Steel Delivery Truck	8	4.4	0.00	9.61	0.00		9.61	0.00	1.50	0.00		1.50
Suncatcher Delivery Truck	0	4.4	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00
Electrical and Control Systems Delivery Truck	2	4.4	0.00	2.40	0.00		2.40	0.00	0.37	0.00		0.37
Tracker Delivery Truck	2	4.4	0.00	2.40	0.00		2.40	0.00	0.37	0.00		0.37
Water Delivery Trucks	0	0	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00
Worker Passenger Vehicles	340	4.8	17.14	38.29	0.00		55.43	2.27	5.07	0.00		7.34
Storage piles						9.53	9.53				0.87	0.87
			203.66	**94.80**	**73.95**	**20.63**	**393.04**	**34.54**	**13.83**	**13.72**	**2.49**	**64.58**

Construction on-site fugitive dust PM2.5

Vehicle Type	Number of Vehicles (month 7)	Max Daily Distance per Vehicle (mile/day)	Month 7 construction on-site fugitive dust: Sealed Road - PM2.5 Fugitive Emissions	Paved Road - PM2.5 Fugitive Emissions	Unpaved Road - PM2.5 Fugitive Emissions	Earthmoving Equipment - PM2.5 Fugitive Emissions	Total PM2.5 Fugitive Emissions	Months 2-13 construction on-site fugitive dust: Sealed Road - PM2.5 Fugitive Emissions	Paved Road - PM2.5 Fugitive Emissions	Unpaved Road - PM2.5 Fugitive Emissions	Earthmoving Equipment - PM2.5 Fugitive Emissions	Total PM2.5 Fugitive Emissions
			lb/day					ton/year				
Diesel Construction Equipment												
Air Compressor	1	0	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00
Asphalt Paver	0	0.2	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00
Backhoe	5	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Compactor	5	0	0.00	0.00	0.00	0.28	0.28	0.00	0.00	0.00	0.04	0.04
Crane small (Hydraulic Vibrating Post Driver and	15	0.5	0.00	0.00	0.23		0.23	0.00	0.00	0.04		0.04
Crane large	3	0.5	0.00	0.00	0.08		0.08	0.00	0.00	0.00		0.00
Dozer	1	0	0.00	0.00	0.00	0.42	0.42	0.00	0.00	0.00	0.05	0.05
Generator	3	0	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00
Grader	1	0	0.00	0.00	0.00	0.11	0.11	0.00	0.00	0.00	0.01	0.01
Light Tower	2	0	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00
Loader	10	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maxi Sneeker (Trencher)	5	0	0.00	0.00	0.00	0.28	0.28	0.00	0.00	0.00	0.04	0.04
Skid Steer (Bobcat)	5	0	0.00	0.00	0.00	2.18	2.18	0.00	0.00	0.00	0.34	0.34
Welding Machine	5	0	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00
Equipment fueled with Propane												
Aerial Lift	6	1	0.10	0.00	0.06		0.16	0.01	0.00	0.01		0.02
Fork Lift	6	1	0.07	0.00	0.05		0.12	0.01	0.00	0.01		0.02
Telehandler	5	1	0.06	0.00	0.04		0.10	0.01	0.00	0.00		0.01
Vehicles with Onroad Engines for Emissions Estimates												
Concrete Delivery Truck for general construction	0	4.4	0.00	0.00	0.00		0.00	0.00	0.03	0.00		0.03
Concrete Delivery Truck for bridge	0	4	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00
Concrete Pump Truck for bridge	0	4.4	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00
Dump Truck	5	8.1	2.67	0.83	0.17	0.01	3.67	0.45	0.14	0.03	0.00	0.62
Flatbed Truck	10	16.2	5.27	1.64	0.49		7.39	0.81	0.25	0.07		1.13
Staff & Security Truck	6	53	5.65	0.00	0.00		5.65	0.88	0.00	0.00		0.88
Pickup Truck	11	16.2	2.28	0.71	0.36		3.34	0.36	0.11	0.06		0.52
Water and Road Preparation Materials Truck	5	48	11.88	0.98	5.92		18.79	2.32	0.19	1.16		3.66
General Materials Delivery Truck for general cor	3	4.4	0.00	0.54	0.00		0.54	0.00	0.06	0.00		0.06
General Materials Delivery Truck for bridge	0	4	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00
Steel Piling Delivery Truck	3	4.4	0.00	0.54	0.00		0.54	0.00	0.03	0.00		0.03
PV Panels Delivery Truck	6	4.4	0.00	1.08	0.00		1.08	0.00	0.17	0.00		0.17
Tracker Steel Delivery Truck	8	4.4	0.00	1.44	0.00		1.44	0.00	0.22	0.00		0.22
Suncatcher Delivery Truck	0	4.4	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00
Electrical and Control Systems Delivery Truck	2	4.4	0.00	0.36	0.00		0.36	0.00	0.06	0.00		0.06
Tracker Delivery Truck	2	4.4	0.00	0.36	0.00		0.36	0.00	0.06	0.00		0.06
Water Delivery Trucks	0	0	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00
Worker Passenger Vehicles	340	4.8	2.57	5.74	0.00		8.31	0.34	0.76	0.00		1.10
Storage piles						2.12	2.12				0.19	0.19
			30.55	**14.22**	**7.40**	**5.40**	**57.57**	**5.18**	**2.07**	**1.37**	**0.68**	**9.31**

Calico Solar

Combustion Exhaust Emissions Off-site (short-term)

To be consistent with on-site emissions, months 7 was used to represent the daily/monthly construction off-site (on-road) emissions.

construction schedule = 12 hours per day 7 am to 7 pm pedestal installation = 16 hours per day

delivery trucks can arrive at the site anytime during the day or night

EMISSION FACTORS

				Emission factors (g/mile)											Emission rate per piece of equipment (lb/hr)									
Vehicles with Onroad Engines for Emissions Estimates	Off-site Miles per Day Travelled within MDAQMD jurisdictional area per Vehicle	**Hours/Day**	**Vehicle Weight (lbs)**	**PM_{10}**	**$PM_{2.5}$**	**CO**	**ROG**	**NO_x**	**SO_2**	**CO_2**	**CH_4**	**N_2O**	**CO_2e**	**PM_{10}**	**$PM_{2.5}$**	**CO**	**ROG**	**NO_x**	**SO_2**	**CO_2**	**CH_4**	**N_2O**	**CO_2e**
Concrete Delivery Truck for general construction	74	12	40,000	5.52E-01	4.70E-01	3.02E+00	6.62E-01	1.50E+01	1.60E-02	1.67E+03	5.10E-03	4.80E-03	1.67E+03	7.50E-03	6.38E-03	4.11E-02	8.99E-03	2.04E-01	2.17E-04	2.27E+01	6.93E-05	6.52E-05	2.27E+01
Concrete Delivery Truck for bridge	74	12	40,000	5.52E-01	4.70E-01	3.02E+00	6.62E-01	1.50E+01	1.60E-02	1.67E+03	5.10E-03	4.80E-03	1.67E+03	7.50E-03	6.38E-03	4.11E-02	8.99E-03	2.04E-01	2.17E-04	2.27E+01	6.93E-05	6.52E-05	2.27E+01
Concrete Pump Truck for bridge	0	12	40,000	5.52E-01	4.70E-01	3.02E+00	6.62E-01	1.50E+01	1.60E-02	1.67E+03	5.10E-03	4.80E-03	1.67E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dump Truck	0	12	40,000	5.52E-01	4.70E-01	3.02E+00	6.62E-01	1.50E+01	1.60E-02	1.67E+03	5.10E-03	4.80E-03	1.67E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Flatbed Truck	0	12	20,000	2.02E-01	1.71E-01	1.37E+00	1.44E-01	7.50E+00	1.40E-02	1.51E+03	1.10E-03	1.70E-03	1.51E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Staff & Security Truck	0	24	4,500	1.00E-02	1.00E-02	2.10E+00	5.50E-02	3.00E-02	4.00E-03	3.26E+02	1.57E-02	1.01E-02	3.30E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pickup Truck	0	12	8,000	3.20E-02	1.77E-02	2.58E+00	7.70E-02	3.09E-01	3.00E-03	2.93E+02	7.04E-02	6.47E-02	3.15E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Water and Road Preparation Materials Truck	0	12	40,000	5.52E-01	4.70E-01	3.02E+00	6.62E-01	1.50E+01	1.60E-02	1.67E+03	5.10E-03	4.80E-03	1.67E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
General Materials Delivery Truck for general cons	74	24	40,000	5.52E-01	4.70E-01	3.02E+00	6.62E-01	1.50E+01	1.60E-02	1.67E+03	5.10E-03	4.80E-03	1.67E+03	3.75E-03	3.19E-03	2.05E-02	4.50E-03	1.02E-01	1.09E-04	1.13E+01	3.46E-05	3.26E-05	1.14E+01
General Materials Delivery Truck for bridge	74	24	40,000	5.52E-01	4.70E-01	3.02E+00	6.62E-01	1.50E+01	1.60E-02	1.67E+03	5.10E-03	4.80E-03	1.67E+03	3.75E-03	3.19E-03	2.05E-02	4.50E-03	1.02E-01	1.09E-04	1.13E+01	3.46E-05	3.26E-05	1.14E+01
Steel Piling Delivery Truck	156	24	40,000	5.52E-01	4.70E-01	3.02E+00	6.62E-01	1.50E+01	1.60E-02	1.67E+03	5.10E-03	4.80E-03	1.67E+03	7.90E-03	6.73E-03	4.33E-02	9.48E-03	2.15E-01	2.29E-04	2.39E+01	7.30E-05	6.87E-05	2.39E+01
PV Panels Delivery Truck	156	24	40,000	5.52E-01	4.70E-01	3.02E+00	6.62E-01	1.50E+01	1.60E-02	1.67E+03	5.10E-03	4.80E-03	1.67E+03	7.90E-03	6.73E-03	4.33E-02	9.48E-03	2.15E-01	2.29E-04	2.39E+01	7.30E-05	6.87E-05	2.39E+01
Tracker Steel Delivery Truck	156	24	40,000	5.52E-01	4.70E-01	3.02E+00	6.62E-01	1.50E+01	1.60E-02	1.67E+03	5.10E-03	4.80E-03	1.67E+03	7.90E-03	6.73E-03	4.33E-02	9.48E-03	2.15E-01	2.29E-04	2.39E+01	7.30E-05	6.87E-05	2.39E+01
Suncatcher Delivery Truck	156	24	40,000	5.52E-01	4.70E-01	3.02E+00	6.62E-01	1.50E+01	1.60E-02	1.67E+03	5.10E-03	4.80E-03	1.67E+03	7.90E-03	6.73E-03	4.33E-02	9.48E-03	2.15E-01	2.29E-04	2.39E+01	7.30E-05	6.87E-05	2.39E+01
Electrical and Control Systems Delivery Truck	156	24	40,000	5.52E-01	4.70E-01	3.02E+00	6.62E-01	1.50E+01	1.60E-02	1.67E+03	5.10E-03	4.80E-03	1.67E+03	7.90E-03	6.73E-03	4.33E-02	9.48E-03	2.15E-01	2.29E-04	2.39E+01	7.30E-05	6.87E-05	2.39E+01
Tracker Delivery Truck	156	24	40,000	5.52E-01	4.70E-01	3.02E+00	6.62E-01	1.50E+01	1.60E-02	1.67E+03	5.10E-03	4.80E-03	1.67E+03	7.90E-03	6.73E-03	4.33E-02	9.48E-03	2.15E-01	2.29E-04	2.39E+01	7.30E-05	6.87E-05	2.39E+01
Water Delivery Trucks	0	24	-	2.02E-01	1.71E-01	1.37E+00	1.44E-01	7.50E+00	1.40E-02	1.51E+03	1.10E-03	1.70E-03	1.51E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Worker Passenger Vehicles	74	24	4,000	3.20E-02	1.77E-02	2.58E+00	7.70E-02	3.09E-01	3.00E-03	2.93E+02	7.04E-02	6.47E-02	3.15E+02	2.17E-04	1.20E-04	1.75E-02	5.23E-04	2.10E-03	2.04E-05	1.99E+00	4.78E-04	4.39E-04	2.14E+00

Notes:

1. Onroad vehicle emissions from EMFAC2007 model. The vehicle description in EMFAC2007 model are as follows:
   - Flatbed Truck and Water Delivery Truck are Medium-Heavy-Duty (MHD-DSL).
   - Staff & Security Truck (gasoline) is Light-Duty (LDT2-CAT)
   - Worker Passenger Vehicle and Pickup Truck are Passenger Car (LDA-ALL)
   - Delivery Truck are all Heavy-Heavy-Duty (HHD-DSL)
2. The emissions of "Toyota Highlander Hybrid" (Staff & Security Truck) meet the Tier 2/Bin 3 Federal emissions standard (reference source 3) and its performance is 27 mile/gallon in city (from Toyota website)
3. SO_2 emission factors for the Toyota Highlander Hybrid are from EMFAC2007- Light-Duty Trucks (LDT2-CAT).
4. CH_4 and N_2O emission factors for the running vehicles are from Reference source 1: Table C.4, California Climate Action Registry General Reporting Protocol Version 3.1, January 2009. Hybrid Truck is assumed to be gasoline light truck here.
5. Greenhouse Gas Global Warming Potential (GWP) - Intergovernmental Panel on Climate Change, Second Assessment Report (1996)

   CO_2 GWP (SAR, 1996) = 1

   CH_4 GWP (SAR, 1996) = 21

   N_2O GWP (SAR, 1996) = 310

MONTHLY EMISSIONS (month 1-20)

	Month 1 Daily Emissions (lb/day)										
	Quantity Mo 1	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e
Vehicles with Onroad Engines for Emissions Estimates											
Concrete Delivery Truck for general construction	2.00	0.18	0.15	0.99	0.22	4.90	0.01	544.63	0.00	0.00	545.15
Concrete Delivery Truck for bridge	-	-	-	-	-	-	-	-	-	-	-
Concrete Pump Truck for bridge	-	-	-	-	-	-	-	-	-	-	-
Dump Truck	3.00	-	-	-	-	-	-	-	-	-	-
Flatbed Truck	2.00	-	-	-	-	-	-	-	-	-	-
Staff & Security Truck	6.00	-	-	-	-	-	-	-	-	-	-
Pickup Truck	11.00	-	-	-	-	-	-	-	-	-	-
Water and Road Preparation Materials Truck	5.00	-	-	-	-	-	-	-	-	-	-
General Materials Delivery Truck for general cons	-	-	-	-	-	-	-	-	-	-	-
General Materials Delivery Truck for bridge	-	-	-	-	-	-	-	-	-	-	-
Steel Piling Delivery Truck	-	-	-	-	-	-	-	-	-	-	-
PV Panels Delivery Truck	6.00	1.14	0.97	6.23	1.36	30.97	0.03	3,444.40	0.01	0.01	3,447.68
Tracker Steel Delivery Truck	8.00	1.52	1.29	8.31	1.82	41.29	0.04	4,592.53	0.01	0.01	4,596.91
Suncatcher Delivery Truck	-	-	-	-	-	-	-	-	-	-	-
Electrical and Control Systems Delivery Truck	2.00	0.38	0.32	2.08	0.45	10.32	0.01	1,148.13	0.00	0.00	1,149.23
Tracker Delivery Truck	2.00	0.38	0.32	2.08	0.45	10.32	0.01	1,148.13	0.00	0.00	1,149.23
Water Delivery Trucks	-	-	-	-	-	-	-	-	-	-	-
Worker Passenger Vehicles	67.00	0.35	0.19	28.22	0.84	3.37	0.03	3,203.62	0.77	0.71	3,438.80
Total	**114.00**	**3.94**	**3.25**	**47.91**	**5.15**	**101.17**	**0.14**	**14,081.43**	**0.80**	**0.74**	**14,327.00**

	Month 2 Daily Emissions (lb/day)										
	Quantity Mo 2	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e
Vehicles with Onroad Engines for Emissions Estimates											
Concrete Delivery Truck for general construction	6.00	0.54	0.46	2.96	0.65	14.69	0.02	1,633.88	0.00	0.00	1,635.44
Concrete Delivery Truck for bridge	-	-	-	-	-	-	-	-	-	-	-
Concrete Pump Truck for bridge	-	-	-	-	-	-	-	-	-	-	-
Dump Truck	7.00	-	-	-	-	-	-	-	-	-	-
Flatbed Truck	9.00	-	-	-	-	-	-	-	-	-	-
Staff & Security Truck	6.00	-	-	-	-	-	-	-	-	-	-
Pickup Truck	11.00	-	-	-	-	-	-	-	-	-	-
Water and Road Preparation Materials Truck	12.00	-	-	-	-	-	-	-	-	-	-
General Materials Delivery Truck for general cons	3.00	0.27	0.23	1.48	0.32	7.34	0.01	816.94	0.00	0.00	817.72
General Materials Delivery Truck for bridge	-	-	-	-	-	-	-	-	-	-	-
Steel Piling Delivery Truck	-	-	-	-	-	-	-	-	-	-	-
PV Panels Delivery Truck	6.00	1.14	0.97	6.23	1.36	30.97	0.03	3,444.40	0.01	0.01	3,447.68
Tracker Steel Delivery Truck	8.00	1.52	1.29	8.31	1.82	41.29	0.04	4,592.53	0.01	0.01	4,596.91
Suncatcher Delivery Truck	-	-	-	-	-	-	-	-	-	-	-
Electrical and Control Systems Delivery Truck	2.00	0.38	0.32	2.08	0.45	10.32	0.01	1,148.13	0.00	0.00	1,149.23
Tracker Delivery Truck	2.00	0.38	0.32	2.08	0.45	10.32	0.01	1,148.13	0.00	0.00	1,149.23
Water Delivery Trucks	-	-	-	-	-	-	-	-	-	-	-
Worker Passenger Vehicles	180.00	0.94	0.52	75.81	2.26	9.07	0.09	8,606.74	2.07	1.90	9,238.58
Total	**252.00**	**5.16**	**4.12**	**98.95**	**7.32**	**124.00**	**0.21**	**21,390.75**	**2.10**	**1.93**	**22,034.79**

	Month 3 Daily Emissions (lb/day)										
	Quantity Mo 3	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e
Vehicles with Onroad Engines for Emissions Estimates											
Concrete Delivery Truck for general construction	6.00	0.54	0.46	2.96	0.65	14.69	0.02	1,633.88	0.00	0.00	1,635.44
Concrete Delivery Truck for bridge	-	-	-	-	-	-	-	-	-	-	-
Concrete Pump Truck for bridge	-	-	-	-	-	-	-	-	-	-	-
Dump Truck	7.00	-	-	-	-	-	-	-	-	-	-
Flatbed Truck	9.00	-	-	-	-	-	-	-	-	-	-
Staff & Security Truck	6.00	-	-	-	-	-	-	-	-	-	-
Pickup Truck	11.00	-	-	-	-	-	-	-	-	-	-
Water and Road Preparation Materials Truck	8.00	-	-	-	-	-	-	-	-	-	-
General Materials Delivery Truck for general cons	3.00	0.27	0.23	1.48	0.32	7.34	0.01	816.94	0.00	0.00	817.72
General Materials Delivery Truck for bridge	-	-	-	-	-	-	-	-	-	-	-
Steel Piling Delivery Truck	-	-	-	-	-	-	-	-	-	-	-
PV Panels Delivery Truck	6.00	1.14	0.97	6.23	1.36	30.97	0.03	3,444.40	0.01	0.01	3,447.68
Tracker Steel Delivery Truck	8.00	1.52	1.29	8.31	1.82	41.29	0.04	4,592.53	0.01	0.01	4,596.91
Suncatcher Delivery Truck	-	-	-	-	-	-	-	-	-	-	-
Electrical and Control Systems Delivery Truck	2.00	0.38	0.32	2.08	0.45	10.32	0.01	1,148.13	0.00	0.00	1,149.23
Tracker Delivery Truck	2.00	0.38	0.32	2.08	0.45	10.32	0.01	1,148.13	0.00	0.00	1,149.23
Water Delivery Trucks	-	-	-	-	-	-	-	-	-	-	-
Worker Passenger Vehicles	249.00	1.30	0.72	104.87	3.13	12.54	0.12	11,906.00	2.86	2.63	12,780.03
Total	**317.00**	**5.52**	**4.32**	**128.01**	**8.19**	**127.47**	**0.24**	**24,690.00**	**2.90**	**2.66**	**25,576.24**

	Month 4 Daily Emissions (lb/day)										
	Quantity Mo 4	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e
Vehicles with Onroad Engines for Emissions Estimates											
Concrete Delivery Truck for general construction	-	-	-	-	-	-	-	-	-	-	-
Concrete Delivery Truck for bridge	-	-	-	-	-	-	-	-	-	-	-
Concrete Pump Truck for bridge	-	-	-	-	-	-	-	-	-	-	-
Dump Truck	6.00	-	-	-	-	-	-	-	-	-	-
Flatbed Truck	10.00	-	-	-	-	-	-	-	-	-	-
Staff & Security Truck	6.00	-	-	-	-	-	-	-	-	-	-
Pickup Truck	11.00	-	-	-	-	-	-	-	-	-	-
Water and Road Preparation Materials Truck	8.00	-	-	-	-	-	-	-	-	-	-
General Materials Delivery Truck for general cons	3.00	0.27	0.23	1.48	0.32	7.34	0.01	816.94	0.00	0.00	817.72
General Materials Delivery Truck for bridge	-	-	-	-	-	-	-	-	-	-	-
Steel Piling Delivery Truck	3.00	0.57	0.48	3.12	0.68	15.48	0.02	1,722.20	0.01	0.00	1,723.84
PV Panels Delivery Truck	6.00	1.14	0.97	6.23	1.36	30.97	0.03	3,444.40	0.01	0.01	3,447.68
Tracker Steel Delivery Truck	8.00	1.52	1.29	8.31	1.82	41.29	0.04	4,592.53	0.01	0.01	4,596.91
Suncatcher Delivery Truck	-	-	-	-	-	-	-	-	-	-	-
Electrical and Control Systems Delivery Truck	2.00	0.38	0.32	2.08	0.45	10.32	0.01	1,148.13	0.00	0.00	1,149.23
Tracker Delivery Truck	2.00	0.38	0.32	2.08	0.45	10.32	0.01	1,148.13	0.00	0.00	1,149.23
Water Delivery Trucks	-	-	-	-	-	-	-	-	-	-	-
Worker Passenger Vehicles	219.00	1.14	0.63	92.24	2.75	11.03	0.11	10,471.54	2.51	2.31	11,240.27
Total	**284.00**	**5.40**	**4.25**	**115.54**	**7.85**	**126.76**	**0.23**	**23,343.86**	**2.55**	**2.35**	**24,124.88**

MONTHLY EMISSIONS (month 21-41)

	Month 21 Daily Emissions (lb/day)										
	Quantity Mo 21	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e
Vehicles with Onroad Engines for Emissions Estimates											
Concrete Delivery Truck for general construction	-	-	-	-	-	-	-	-	-	-	-
Concrete Delivery Truck for bridge	-	-	-	-	-	-	-	-	-	-	-
Concrete Pump Truck for bridge	-	-	-	-	-	-	-	-	-	-	-
Dump Truck	5.00	-	-	-	-	-	-	-	-	-	-
Flatbed Truck	10.00	-	-	-	-	-	-	-	-	-	-
Staff & Security Truck	6.00	-	-	-	-	-	-	-	-	-	-
Pickup Truck	11.00	-	-	-	-	-	-	-	-	-	-
Water and Road Preparation Materials Truck	5.00	-	-	-	-	-	-	-	-	-	-
General Materials Delivery Truck for general cons	-	-	-	-	-	-	-	-	-	-	-
General Materials Delivery Truck for bridge	-	-	-	-	-	-	-	-	-	-	-
Steel Piling Delivery Truck	3.00	0.57	0.48	3.12	0.68	15.48	0.02	1,722.20	0.01	0.00	1,723.84
PV Panels Delivery Truck	6.00	1.14	0.97	6.23	1.36	30.97	0.03	3,444.40	0.01	0.01	3,447.68
Tracker Steel Delivery Truck	8.00	1.52	1.29	8.31	1.82	41.29	0.04	4,592.53	0.01	0.01	4,596.91
Suncatcher Delivery Truck	-	-	-	-	-	-	-	-	-	-	-
Electrical and Control Systems Delivery Truck	2.00	0.38	0.32	2.08	0.45	10.32	0.01	1,148.13	0.00	0.00	1,149.23
Tracker Delivery Truck	2.00	0.38	0.32	2.08	0.45	10.32	0.01	1,148.13	0.00	0.00	1,149.23
Water Delivery Trucks	-	-	-	-	-	-	-	-	-	-	-
Worker Passenger Vehicles	209.00	1.09	0.60	88.03	2.62	10.53	0.10	9,993.39	2.40	2.20	10,727.01
Total	**267.00**	**5.07**	**4.00**	**109.85**	**7.40**	**118.91**	**0.22**	**22,048.77**	**2.44**	**2.24**	**22,793.91**

	Month 22 Daily Emissions (lb/day)										
	Quantity Mo 22	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e
Vehicles with Onroad Engines for Emissions Estimates											
Concrete Delivery Truck for general construction	-	-	-	-	-	-	-	-	-	-	-
Concrete Delivery Truck for bridge	-	-	-	-	-	-	-	-	-	-	-
Concrete Pump Truck for bridge	-	-	-	-	-	-	-	-	-	-	-
Dump Truck	5.00	-	-	-	-	-	-	-	-	-	-
Flatbed Truck	10.00	-	-	-	-	-	-	-	-	-	-
Staff & Security Truck	6.00	-	-	-	-	-	-	-	-	-	-
Pickup Truck	11.00	-	-	-	-	-	-	-	-	-	-
Water and Road Preparation Materials Truck	5.00	-	-	-	-	-	-	-	-	-	-
General Materials Delivery Truck for general cons	-	-	-	-	-	-	-	-	-	-	-
General Materials Delivery Truck for bridge	-	-	-	-	-	-	-	-	-	-	-
Steel Piling Delivery Truck	3.00	0.57	0.48	3.12	0.68	15.48	0.02	1,722.20	0.01	0.00	1,723.84
PV Panels Delivery Truck	6.00	1.14	0.97	6.23	1.36	30.97	0.03	3,444.40	0.01	0.01	3,447.68
Tracker Steel Delivery Truck	8.00	1.52	1.29	8.31	1.82	41.29	0.04	4,592.53	0.01	0.01	4,596.91
Suncatcher Delivery Truck	-	-	-	-	-	-	-	-	-	-	-
Electrical and Control Systems Delivery Truck	2.00	0.38	0.32	2.08	0.45	10.32	0.01	1,148.13	0.00	0.00	1,149.23
Tracker Delivery Truck	2.00	0.38	0.32	2.08	0.45	10.32	0.01	1,148.13	0.00	0.00	1,149.23
Water Delivery Trucks	-	-	-	-	-	-	-	-	-	-	-
Worker Passenger Vehicles	208.00	1.08	0.60	87.61	2.61	10.48	0.10	9,945.57	2.39	2.19	10,675.69
Total	**266.00**	**5.07**	**3.99**	**109.43**	**7.39**	**118.86**	**0.22**	**22,000.96**	**2.42**	**2.23**	**22,742.58**

	Month 23 Daily Emissions (lb/day)										
	Quantity Mo 23	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e
Vehicles with Onroad Engines for Emissions Estimates											
Concrete Delivery Truck for general construction	-	-	-	-	-	-	-	-	-	-	-
Concrete Delivery Truck for bridge	-	-	-	-	-	-	-	-	-	-	-
Concrete Pump Truck for bridge	-	-	-	-	-	-	-	-	-	-	-
Dump Truck	5.00	-	-	-	-	-	-	-	-	-	-
Flatbed Truck	10.00	-	-	-	-	-	-	-	-	-	-
Staff & Security Truck	6.00	-	-	-	-	-	-	-	-	-	-
Pickup Truck	11.00	-	-	-	-	-	-	-	-	-	-
Water and Road Preparation Materials Truck	3.00	-	-	-	-	-	-	-	-	-	-
General Materials Delivery Truck for general cons	-	-	-	-	-	-	-	-	-	-	-
General Materials Delivery Truck for bridge	-	-	-	-	-	-	-	-	-	-	-
Steel Piling Delivery Truck	3.00	0.57	0.48	3.12	0.68	15.48	0.02	1,722.20	0.01	0.00	1,723.84
PV Panels Delivery Truck	6.00	1.14	0.97	6.23	1.36	30.97	0.03	3,444.40	0.01	0.01	3,447.68
Tracker Steel Delivery Truck	8.00	1.52	1.29	8.31	1.82	41.29	0.04	4,592.53	0.01	0.01	4,596.91
Suncatcher Delivery Truck	-	-	-	-	-	-	-	-	-	-	-
Electrical and Control Systems Delivery Truck	2.00	0.38	0.32	2.08	0.45	10.32	0.01	1,148.13	0.00	0.00	1,149.23
Tracker Delivery Truck	2.00	0.38	0.32	2.08	0.45	10.32	0.01	1,148.13	0.00	0.00	1,149.23
Water Delivery Trucks	-	-	-	-	-	-	-	-	-	-	-
Worker Passenger Vehicles	208.00	1.08	0.60	87.61	2.61	10.48	0.10	9,945.57	2.39	2.19	10,675.69
Total	**264.00**	**5.07**	**3.99**	**109.43**	**7.39**	**118.86**	**0.22**	**22,000.96**	**2.42**	**2.23**	**22,742.58**

	Month 24 Daily Emissions (lb/day)										
	Quantity Mo 24	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e
Vehicles with Onroad Engines for Emissions Estimates											
Concrete Delivery Truck for general construction	-	-	-	-	-	-	-	-	-	-	-
Concrete Delivery Truck for bridge	-	-	-	-	-	-	-	-	-	-	-
Concrete Pump Truck for bridge	-	-	-	-	-	-	-	-	-	-	-
Dump Truck	5.00	-	-	-	-	-	-	-	-	-	-
Flatbed Truck	10.00	-	-	-	-	-	-	-	-	-	-
Staff & Security Truck	6.00	-	-	-	-	-	-	-	-	-	-
Pickup Truck	11.00	-	-	-	-	-	-	-	-	-	-
Water and Road Preparation Materials Truck	3.00	-	-	-	-	-	-	-	-	-	-
General Materials Delivery Truck for general cons	-	-	-	-	-	-	-	-	-	-	-
General Materials Delivery Truck for bridge	-	-	-	-	-	-	-	-	-	-	-
Steel Piling Delivery Truck	3.00	0.57	0.48	3.12	0.68	15.48	0.02	1,722.20	0.01	0.00	1,723.84
PV Panels Delivery Truck	6.00	1.14	0.97	6.23	1.36	30.97	0.03	3,444.40	0.01	0.01	3,447.68
Tracker Steel Delivery Truck	8.00	1.52	1.29	8.31	1.82	41.29	0.04	4,592.53	0.01	0.01	4,596.91
Suncatcher Delivery Truck	-	-	-	-	-	-	-	-	-	-	-
Electrical and Control Systems Delivery Truck	2.00	0.38	0.32	2.08	0.45	10.32	0.01	1,148.13	0.00	0.00	1,149.23
Tracker Delivery Truck	2.00	0.38	0.32	2.08	0.45	10.32	0.01	1,148.13	0.00	0.00	1,149.23
Water Delivery Trucks	-	-	-	-	-	-	-	-	-	-	-
Worker Passenger Vehicles	208.00	1.08	0.60	87.61	2.61	10.48	0.10	9,945.57	2.39	2.19	10,675.69
Total	**264.00**	**5.07**	**3.99**	**109.43**	**7.39**	**118.86**	**0.22**	**22,000.96**	**2.42**	**2.23**	**22,742.58**

Month 5 Daily Emissions (lb/day)

Quantity Mo 5	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
5.00	-	-	-	-	-	-	-	-	-	-
10.00	-	-	-	-	-	-	-	-	-	-
6.00	-	-	-	-	-	-	-	-	-	-
11.00	-	-	-	-	-	-	-	-	-	-
7.00	-	-	-	-	-	-	-	-	-	-
3.00	0.27	0.23	1.48	0.32	7.34	0.01	816.94	0.00	0.00	817.72
-	-	-	-	-	-	-	-	-	-	-
3.00	0.57	0.48	3.12	0.68	15.48	0.02	1,722.20	0.01	0.00	1,723.84
6.00	1.14	0.97	6.23	1.36	30.97	0.03	3,444.40	0.01	0.01	3,447.68
8.00	1.52	1.29	8.31	1.82	41.29	0.04	4,592.53	0.01	0.01	4,596.91
-	-	-	-	-	-	-	-	-	-	-
2.00	0.38	0.32	2.08	0.45	10.32	0.01	1,148.13	0.00	0.00	1,149.23
2.00	0.38	0.32	2.08	0.45	10.32	0.01	1,148.13	0.00	0.00	1,149.23
-	-	-	-	-	-	-	-	-	-	-
219.00	1.14	0.63	92.24	2.75	11.03	0.11	10,471.54	2.51	2.31	11,240.27
282.00	**5.40**	**4.25**	**115.54**	**7.85**	**126.76**	**0.23**	**23,343.86**	**2.55**	**2.35**	**24,124.88**

Month 6 Daily Emissions (lb/day)

Quantity Mo 6	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
5.00	-	-	-	-	-	-	-	-	-	-
10.00	-	-	-	-	-	-	-	-	-	-
6.00	-	-	-	-	-	-	-	-	-	-
11.00	-	-	-	-	-	-	-	-	-	-
5.00	-	-	-	-	-	-	-	-	-	-
3.00	0.27	0.23	1.48	0.32	7.34	0.01	816.94	0.00	0.00	817.72
-	-	-	-	-	-	-	-	-	-	-
3.00	0.57	0.48	3.12	0.68	15.48	0.02	1,722.20	0.01	0.00	1,723.84
6.00	1.14	0.97	6.23	1.36	30.97	0.03	3,444.40	0.01	0.01	3,447.68
8.00	1.52	1.29	8.31	1.82	41.29	0.04	4,592.53	0.01	0.01	4,596.91
-	-	-	-	-	-	-	-	-	-	-
2.00	0.38	0.32	2.08	0.45	10.32	0.01	1,148.13	0.00	0.00	1,149.23
2.00	0.38	0.32	2.08	0.45	10.32	0.01	1,148.13	0.00	0.00	1,149.23
-	-	-	-	-	-	-	-	-	-	-
320.00	1.67	0.93	134.78	4.02	16.12	0.16	15,300.88	3.67	3.37	16,424.14
381.00	**5.92**	**4.55**	**158.08**	**9.12**	**131.84**	**0.28**	**28,173.20**	**3.71**	**3.41**	**29,308.75**

Month 7 Daily Emissions (lb/day)

Quantity Mo 7	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
5.00	-	-	-	-	-	-	-	-	-	-
10.00	-	-	-	-	-	-	-	-	-	-
6.00	-	-	-	-	-	-	-	-	-	-
11.00	-	-	-	-	-	-	-	-	-	-
5.00	-	-	-	-	-	-	-	-	-	-
3.00	0.27	0.23	1.48	0.32	7.34	0.01	816.94	0.00	0.00	817.72
-	-	-	-	-	-	-	-	-	-	-
3.00	0.57	0.48	3.12	0.68	15.48	0.02	1,722.20	0.01	0.00	1,723.84
6.00	1.14	0.97	6.23	1.36	30.97	0.03	3,444.40	0.01	0.01	3,447.68
8.00	1.52	1.29	8.31	1.82	41.29	0.04	4,592.53	0.01	0.01	4,596.91
-	-	-	-	-	-	-	-	-	-	-
2.00	0.38	0.32	2.08	0.45	10.32	0.01	1,148.13	0.00	0.00	1,149.23
2.00	0.38	0.32	2.08	0.45	10.32	0.01	1,148.13	0.00	0.00	1,149.23
-	-	-	-	-	-	-	-	-	-	-
340.00	1.77	0.98	143.20	4.27	17.12	0.17	16,257.18	3.90	3.59	17,450.64
401.00	**6.03**	**4.60**	**166.50**	**9.37**	**132.85**	**0.29**	**29,129.51**	**3.94**	**3.62**	**30,335.26**

Month 8 Daily Emissions (lb/day)

Quantity Mo 8	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
5.00	-	-	-	-	-	-	-	-	-	-
10.00	-	-	-	-	-	-	-	-	-	-
6.00	-	-	-	-	-	-	-	-	-	-
11.00	-	-	-	-	-	-	-	-	-	-
5.00	-	-	-	-	-	-	-	-	-	-
3.00	0.27	0.23	1.48	0.32	7.34	0.01	816.94	0.00	0.00	817.72
-	-	-	-	-	-	-	-	-	-	-
1.00	0.19	0.16	1.04	0.23	5.16	0.01	574.07	0.00	0.00	574.61
6.00	1.14	0.97	6.23	1.36	30.97	0.03	3,444.40	0.01	0.01	3,447.68
8.00	1.52	1.29	8.31	1.82	41.29	0.04	4,592.53	0.01	0.01	4,596.91
-	-	-	-	-	-	-	-	-	-	-
2.00	0.38	0.32	2.08	0.45	10.32	0.01	1,148.13	0.00	0.00	1,149.23
2.00	0.38	0.32	2.08	0.45	10.32	0.01	1,148.13	0.00	0.00	1,149.23
-	-	-	-	-	-	-	-	-	-	-
330.00	1.72	0.95	138.99	4.14	16.62	0.16	15,779.03	3.79	3.48	16,937.39
389.00	**5.59**	**4.25**	**160.21**	**8.79**	**122.03**	**0.27**	**27,503.22**	**3.82**	**3.51**	**28,672.78**

Month 25 Daily Emissions (lb/day)

Quantity Mo 25	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e
-	-	-	-	-	-	-	-	-	-	-
1.00	0.09	0.08	0.49	0.11	2.45	0.00	272.31	0.00	0.00	272.57
1.00	-	-	-	-	-	-	-	-	-	-
6.00	-	-	-	-	-	-	-	-	-	-
10.00	-	-	-	-	-	-	-	-	-	-
6.00	-	-	-	-	-	-	-	-	-	-
11.00	-	-	-	-	-	-	-	-	-	-
4.00	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
2.00	0.18	0.15	0.99	0.22	4.90	0.01	544.63	0.00	0.00	545.15
3.00	0.57	0.48	3.12	0.68	15.48	0.02	1,722.20	0.01	0.00	1,723.84
6.00	1.14	0.97	6.23	1.36	30.97	0.03	3,444.40	0.01	0.01	3,447.68
8.00	1.52	1.29	8.31	1.82	41.29	0.04	4,592.53	0.01	0.01	4,596.91
-	-	-	-	-	-	-	-	-	-	-
2.00	0.38	0.32	2.08	0.45	10.32	0.01	1,148.13	0.00	0.00	1,149.23
2.00	0.38	0.32	2.08	0.45	10.32	0.01	1,148.13	0.00	0.00	1,149.23
-	-	-	-	-	-	-	-	-	-	-
208.00	1.08	0.60	87.61	2.61	10.48	0.10	9,945.57	2.39	2.19	10,675.69
270.00	**5.34**	**4.22**	**110.91**	**7.71**	**126.20**	**0.22**	**22,817.90**	**2.43**	**2.23**	**23,560.30**

Month 26 Daily Emissions (lb/day)

Quantity Mo 26	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e
-	-	-	-	-	-	-	-	-	-	-
1.00	0.09	0.08	0.49	0.11	2.45	0.00	272.31	0.00	0.00	272.57
1.00	-	-	-	-	-	-	-	-	-	-
6.00	-	-	-	-	-	-	-	-	-	-
11.00	-	-	-	-	-	-	-	-	-	-
6.00	-	-	-	-	-	-	-	-	-	-
11.00	-	-	-	-	-	-	-	-	-	-
4.00	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
2.00	0.18	0.15	0.99	0.22	4.90	0.01	544.63	0.00	0.00	545.15
-	-	-	-	-	-	-	-	-	-	-
6.00	1.14	0.97	6.23	1.36	30.97	0.03	3,444.40	0.01	0.01	3,447.68
8.00	1.52	1.29	8.31	1.82	41.29	0.04	4,592.53	0.01	0.01	4,596.91
-	-	-	-	-	-	-	-	-	-	-
2.00	0.38	0.32	2.08	0.45	10.32	0.01	1,148.13	0.00	0.00	1,149.23
2.00	0.38	0.32	2.08	0.45	10.32	0.01	1,148.13	0.00	0.00	1,149.23
-	-	-	-	-	-	-	-	-	-	-
208.00	1.08	0.60	87.61	2.61	10.48	0.10	9,945.57	2.39	2.19	10,675.69
268.00	**4.77**	**3.74**	**107.79**	**7.03**	**110.72**	**0.21**	**21,095.70**	**2.42**	**2.23**	**21,836.46**

Month 27 Daily Emissions (lb/day)

Quantity Mo 27	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e
-	-	-	-	-	-	-	-	-	-	-
1.00	0.09	0.08	0.49	0.11	2.45	0.00	272.31	0.00	0.00	272.57
1.00	-	-	-	-	-	-	-	-	-	-
6.00	-	-	-	-	-	-	-	-	-	-
11.00	-	-	-	-	-	-	-	-	-	-
6.00	-	-	-	-	-	-	-	-	-	-
11.00	-	-	-	-	-	-	-	-	-	-
3.00	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
2.00	0.18	0.15	0.99	0.22	4.90	0.01	544.63	0.00	0.00	545.15
-	-	-	-	-	-	-	-	-	-	-
6.00	1.14	0.97	6.23	1.36	30.97	0.03	3,444.40	0.01	0.01	3,447.68
8.00	1.52	1.29	8.31	1.82	41.29	0.04	4,592.53	0.01	0.01	4,596.91
-	-	-	-	-	-	-	-	-	-	-
2.00	0.38	0.32	2.08	0.45	10.32	0.01	1,148.13	0.00	0.00	1,149.23
2.00	0.38	0.32	2.08	0.45	10.32	0.01	1,148.13	0.00	0.00	1,149.23
-	-	-	-	-	-	-	-	-	-	-
208.00	1.08	0.60	87.61	2.61	10.48	0.10	9,945.57	2.39	2.19	10,675.69
267.00	**4.77**	**3.74**	**107.79**	**7.03**	**110.72**	**0.21**	**21,095.70**	**2.42**	**2.23**	**21,836.46**

Month 28 Daily Emissions (lb/day)

Quantity Mo 28	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e
-	-	-	-	-	-	-	-	-	-	-
1.00	0.09	0.08	0.49	0.11	2.45	0.00	272.31	0.00	0.00	272.57
1.00	-	-	-	-	-	-	-	-	-	-
5.00	-	-	-	-	-	-	-	-	-	-
10.00	-	-	-	-	-	-	-	-	-	-
6.00	-	-	-	-	-	-	-	-	-	-
11.00	-	-	-	-	-	-	-	-	-	-
3.00	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
2.00	0.18	0.15	0.99	0.22	4.90	0.01	544.63	0.00	0.00	545.15
-	-	-	-	-	-	-	-	-	-	-
6.00	1.14	0.97	6.23	1.36	30.97	0.03	3,444.40	0.01	0.01	3,447.68
8.00	1.52	1.29	8.31	1.82	41.29	0.04	4,592.53	0.01	0.01	4,596.91
-	-	-	-	-	-	-	-	-	-	-
2.00	0.38	0.32	2.08	0.45	10.32	0.01	1,148.13	0.00	0.00	1,149.23
2.00	0.38	0.32	2.08	0.45	10.32	0.01	1,148.13	0.00	0.00	1,149.23
-	-	-	-	-	-	-	-	-	-	-
166.00	0.87	0.48	69.92	2.08	8.36	0.08	7,937.33	1.90	1.75	8,520.02
223.00	**4.55**	**3.62**	**90.10**	**6.50**	**108.60**	**0.19**	**19,087.46**	**1.94**	**1.78**	**19,680.79**

Month 9 Daily Emissions (lb/day)

Quantity Mo 9	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
5.00	-	-	-	-	-	-	-	-	-	-
10.00	-	-	-	-	-	-	-	-	-	-
6.00	-	-	-	-	-	-	-	-	-	-
11.00	-	-	-	-	-	-	-	-	-	-
5.00	-	-	-	-	-	-	-	-	-	-
3.00	0.27	0.23	1.48	0.32	7.34	0.01	816.94	0.00	0.00	817.72
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
6.00	1.14	0.97	6.23	1.36	30.97	0.03	3,444.40	0.01	0.01	3,447.68
8.00	1.52	1.29	8.31	1.82	41.29	0.04	4,592.53	0.01	0.01	4,596.91
-	-	-	-	-	-	-	-	-	-	-
2.00	0.38	0.32	2.08	0.45	10.32	0.01	1,148.13	0.00	0.00	1,149.23
2.00	0.38	0.32	2.08	0.45	10.32	0.01	1,148.13	0.00	0.00	1,149.23
-	-	-	-	-	-	-	-	-	-	-
334.00	1.74	0.97	140.67	4.19	16.82	0.16	15,970.29	3.83	3.52	17,142.69
392.00	**5.43**	**4.10**	**160.86**	**8.61**	**117.07**	**0.27**	**27,120.42**	**3.87**	**3.55**	**28,303.46**

Month 10 Daily Emissions (lb/day)

Quantity Mo 10	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
5.00	-	-	-	-	-	-	-	-	-	-
10.00	-	-	-	-	-	-	-	-	-	-
6.00	-	-	-	-	-	-	-	-	-	-
11.00	-	-	-	-	-	-	-	-	-	-
5.00	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
6.00	1.14	0.97	6.23	1.36	30.97	0.03	3,444.40	0.01	0.01	3,447.68
8.00	1.52	1.29	8.31	1.82	41.29	0.04	4,592.53	0.01	0.01	4,596.91
-	-	-	-	-	-	-	-	-	-	-
2.00	0.38	0.32	2.08	0.45	10.32	0.01	1,148.13	0.00	0.00	1,149.23
2.00	0.38	0.32	2.08	0.45	10.32	0.01	1,148.13	0.00	0.00	1,149.23
-	-	-	-	-	-	-	-	-	-	-
305.00	1.59	0.88	128.46	3.83	15.36	0.15	14,583.65	3.50	3.22	15,654.25
360.00	**5.00**	**3.79**	**147.16**	**7.92**	**108.26**	**0.25**	**24,916.84**	**3.53**	**3.25**	**25,997.31**

Month 11 Daily Emissions (lb/day)

Quantity Mo 11	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
5.00	-	-	-	-	-	-	-	-	-	-
10.00	-	-	-	-	-	-	-	-	-	-
6.00	-	-	-	-	-	-	-	-	-	-
11.00	-	-	-	-	-	-	-	-	-	-
5.00	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
6.00	1.14	0.97	6.23	1.36	30.97	0.03	3,444.40	0.01	0.01	3,447.68
8.00	1.52	1.29	8.31	1.82	41.29	0.04	4,592.53	0.01	0.01	4,596.91
-	-	-	-	-	-	-	-	-	-	-
2.00	0.38	0.32	2.08	0.45	10.32	0.01	1,148.13	0.00	0.00	1,149.23
2.00	0.38	0.32	2.08	0.45	10.32	0.01	1,148.13	0.00	0.00	1,149.23
-	-	-	-	-	-	-	-	-	-	-
305.00	1.59	0.88	128.46	3.83	15.36	0.15	14,583.65	3.50	3.22	15,654.25
360.00	**5.00**	**3.79**	**147.16**	**7.92**	**108.26**	**0.25**	**24,916.84**	**3.53**	**3.25**	**25,997.31**

Month 12 Daily Emissions (lb/day)

Quantity Mo 12	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
5.00	-	-	-	-	-	-	-	-	-	-
10.00	-	-	-	-	-	-	-	-	-	-
6.00	-	-	-	-	-	-	-	-	-	-
11.00	-	-	-	-	-	-	-	-	-	-
5.00	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
6.00	1.14	0.97	6.23	1.36	30.97	0.03	3,444.40	0.01	0.01	3,447.68
8.00	1.52	1.29	8.31	1.82	41.29	0.04	4,592.53	0.01	0.01	4,596.91
-	-	-	-	-	-	-	-	-	-	-
2.00	0.38	0.32	2.08	0.45	10.32	0.01	1,148.13	0.00	0.00	1,149.23
2.00	0.38	0.32	2.08	0.45	10.32	0.01	1,148.13	0.00	0.00	1,149.23
-	-	-	-	-	-	-	-	-	-	-
305.00	1.59	0.88	128.46	3.83	15.36	0.15	14,583.65	3.50	3.22	15,654.25
360.00	**5.00**	**3.79**	**147.16**	**7.92**	**108.26**	**0.25**	**24,916.84**	**3.53**	**3.25**	**25,997.31**

Month 29 Daily Emissions (lb/day)

Quantity Mo 29	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e
-	-	-	-	-	-	-	-	-	-	-
1.00	0.09	0.08	0.49	0.11	2.45	0.00	272.31	0.00	0.00	272.57
1.00	-	-	-	-	-	-	-	-	-	-
2.00	-	-	-	-	-	-	-	-	-	-
7.00	-	-	-	-	-	-	-	-	-	-
6.00	-	-	-	-	-	-	-	-	-	-
11.00	-	-	-	-	-	-	-	-	-	-
1.00	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
6.00	0.54	0.46	2.96	0.65	14.69	0.02	1,633.88	0.00	0.00	1,635.44
-	-	-	-	-	-	-	-	-	-	-
6.00	1.14	0.97	6.23	1.36	30.97	0.03	3,444.40	0.01	0.01	3,447.68
8.00	1.52	1.29	8.31	1.82	41.29	0.04	4,592.53	0.01	0.01	4,596.91
-	-	-	-	-	-	-	-	-	-	-
2.00	0.38	0.32	2.08	0.45	10.32	0.01	1,148.13	0.00	0.00	1,149.23
2.00	0.38	0.32	2.08	0.45	10.32	0.01	1,148.13	0.00	0.00	1,149.23
-	-	-	-	-	-	-	-	-	-	-
166.00	0.87	0.48	69.92	2.08	8.36	0.08	7,937.33	1.90	1.75	8,520.02
219.00	**4.91**	**3.92**	**92.07**	**6.93**	**118.40**	**0.20**	**20,176.71**	**1.94**	**1.79**	**20,771.09**

Month 30 Daily Emissions (lb/day)

Quantity Mo 30	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e
-	-	-	-	-	-	-	-	-	-	-
3.00	0.27	0.23	1.48	0.32	7.34	0.01	816.94	0.00	0.00	817.72
1.00	-	-	-	-	-	-	-	-	-	-
2.00	-	-	-	-	-	-	-	-	-	-
7.00	-	-	-	-	-	-	-	-	-	-
6.00	-	-	-	-	-	-	-	-	-	-
11.00	-	-	-	-	-	-	-	-	-	-
1.00	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
6.00	0.54	0.46	2.96	0.65	14.69	0.02	1,633.88	0.00	0.00	1,635.44
-	-	-	-	-	-	-	-	-	-	-
6.00	1.14	0.97	6.23	1.36	30.97	0.03	3,444.40	0.01	0.01	3,447.68
8.00	1.52	1.29	8.31	1.82	41.29	0.04	4,592.53	0.01	0.01	4,596.91
21.00	3.98	3.39	21.82	4.78	108.38	0.12	12,055.38	0.04	0.03	12,066.89
2.00	0.38	0.32	2.08	0.45	10.32	0.01	1,148.13	0.00	0.00	1,149.23
2.00	0.38	0.32	2.08	0.45	10.32	0.01	1,148.13	0.00	0.00	1,149.23
-	-	-	-	-	-	-	-	-	-	-
166.00	0.87	0.48	69.92	2.08	8.36	0.08	7,937.33	1.90	1.75	8,520.02
242.00	**9.07**	**7.47**	**114.88**	**11.93**	**231.68**	**0.32**	**32,776.72**	**1.98**	**1.82**	**33,383.13**

Month 31 Daily Emissions (lb/day)

Quantity Mo 31	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e
-	-	-	-	-	-	-	-	-	-	-
1.00	0.09	0.08	0.49	0.11	2.45	0.00	272.31	0.00	0.00	272.57
1.00	-	-	-	-	-	-	-	-	-	-
1.00	-	-	-	-	-	-	-	-	-	-
7.00	-	-	-	-	-	-	-	-	-	-
6.00	-	-	-	-	-	-	-	-	-	-
11.00	-	-	-	-	-	-	-	-	-	-
1.00	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
2.00	0.18	0.15	0.99	0.22	4.90	0.01	544.63	0.00	0.00	545.15
-	-	-	-	-	-	-	-	-	-	-
6.00	1.14	0.97	6.23	1.36	30.97	0.03	3,444.40	0.01	0.01	3,447.68
8.00	1.52	1.29	8.31	1.82	41.29	0.04	4,592.53	0.01	0.01	4,596.91
21.00	3.98	3.39	21.82	4.78	108.38	0.12	12,055.38	0.04	0.03	12,066.89
2.00	0.38	0.32	2.08	0.45	10.32	0.01	1,148.13	0.00	0.00	1,149.23
2.00	0.38	0.32	2.08	0.45	10.32	0.01	1,148.13	0.00	0.00	1,149.23
-	-	-	-	-	-	-	-	-	-	-
166.00	0.87	0.48	69.92	2.08	8.36	0.08	7,937.33	1.90	1.75	8,520.02
235.00	**8.53**	**7.01**	**111.92**	**11.28**	**216.99**	**0.30**	**31,142.84**	**1.98**	**1.82**	**31,747.69**

Month 32 Daily Emissions (lb/day)

Quantity Mo 32	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
7.00	-	-	-	-	-	-	-	-	-	-
6.00	-	-	-	-	-	-	-	-	-	-
11.00	-	-	-	-	-	-	-	-	-	-
1.00	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
6.00	1.14	0.97	6.23	1.36	30.97	0.03	3,444.40	0.01	0.01	3,447.68
8.00	1.52	1.29	8.31	1.82	41.29	0.04	4,592.53	0.01	0.01	4,596.91
21.00	3.98	3.39	21.82	4.78	108.38	0.12	12,055.38	0.04	0.03	12,066.89
2.00	0.38	0.32	2.08	0.45	10.32	0.01	1,148.13	0.00	0.00	1,149.23
2.00	0.38	0.32	2.08	0.45	10.32	0.01	1,148.13	0.00	0.00	1,149.23
-	-	-	-	-	-	-	-	-	-	-
166.00	0.87	0.48	69.92	2.08	8.36	0.08	7,937.33	1.90	1.75	8,520.02
230.00	**8.26**	**6.78**	**110.44**	**10.95**	**209.64**	**0.30**	**30,325.90**	**1.97**	**1.81**	**30,929.97**

Month 13 Daily Emissions (lb/day)										
Quantity Mo 13	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
5.00	-	-	-	-	-	-	-	-	-	-
10.00	-	-	-	-	-	-	-	-	-	-
6.00	-	-	-	-	-	-	-	-	-	-
11.00	-	-	-	-	-	-	-	-	-	-
5.00	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
6.00	1.14	0.97	6.23	1.36	30.97	0.03	3,444.40	0.01	0.01	3,447.68
8.00	1.52	1.29	8.31	1.82	41.29	0.04	4,592.53	0.01	0.01	4,596.91
-	-	-	-	-	-	-	-	-	-	-
2.00	0.38	0.32	2.08	0.45	10.32	0.01	1,148.13	0.00	0.00	1,149.23
2.00	0.38	0.32	2.08	0.45	10.32	0.01	1,148.13	0.00	0.00	1,149.23
-	-	-	-	-	-	-	-	-	-	-
357.00	1.86	1.03	150.36	4.48	17.98	0.17	17,070.04	4.10	3.76	18,323.18
412.00	**5.28**	**3.94**	**169.06**	**8.58**	**110.88**	**0.27**	**27,403.23**	**4.13**	**3.79**	**28,666.23**

Month 14 Daily Emissions (lb/day)										
Quantity Mo 14	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
5.00	-	-	-	-	-	-	-	-	-	-
10.00	-	-	-	-	-	-	-	-	-	-
6.00	-	-	-	-	-	-	-	-	-	-
11.00	-	-	-	-	-	-	-	-	-	-
5.00	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
6.00	1.14	0.97	6.23	1.36	30.97	0.03	3,444.40	0.01	0.01	3,447.68
8.00	1.52	1.29	8.31	1.82	41.29	0.04	4,592.53	0.01	0.01	4,596.91
-	-	-	-	-	-	-	-	-	-	-
2.00	0.38	0.32	2.08	0.45	10.32	0.01	1,148.13	0.00	0.00	1,149.23
2.00	0.38	0.32	2.08	0.45	10.32	0.01	1,148.13	0.00	0.00	1,149.23
-	-	-	-	-	-	-	-	-	-	-
341.00	1.78	0.99	143.62	4.28	17.17	0.17	16,305.00	3.91	3.60	17,501.97
396.00	**5.19**	**3.89**	**162.33**	**8.37**	**110.07**	**0.27**	**26,638.19**	**3.94**	**3.63**	**27,845.02**

Month 15 Daily Emissions (lb/day)										
Quantity Mo 15	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
5.00	-	-	-	-	-	-	-	-	-	-
10.00	-	-	-	-	-	-	-	-	-	-
6.00	-	-	-	-	-	-	-	-	-	-
11.00	-	-	-	-	-	-	-	-	-	-
5.00	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
6.00	1.14	0.97	6.23	1.36	30.97	0.03	3,444.40	0.01	0.01	3,447.68
8.00	1.52	1.29	8.31	1.82	41.29	0.04	4,592.53	0.01	0.01	4,596.91
-	-	-	-	-	-	-	-	-	-	-
2.00	0.38	0.32	2.08	0.45	10.32	0.01	1,148.13	0.00	0.00	1,149.23
2.00	0.38	0.32	2.08	0.45	10.32	0.01	1,148.13	0.00	0.00	1,149.23
-	-	-	-	-	-	-	-	-	-	-
347.00	1.81	1.00	146.15	4.36	17.48	0.17	16,591.89	3.98	3.66	17,809.92
402.00	**5.22**	**3.91**	**164.85**	**8.45**	**110.38**	**0.27**	**26,925.08**	**4.01**	**3.69**	**28,152.97**

Month 16 Daily Emissions (lb/day)										
Quantity Mo 16	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
5.00	-	-	-	-	-	-	-	-	-	-
10.00	-	-	-	-	-	-	-	-	-	-
6.00	-	-	-	-	-	-	-	-	-	-
11.00	-	-	-	-	-	-	-	-	-	-
5.00	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
6.00	1.14	0.97	6.23	1.36	30.97	0.03	3,444.40	0.01	0.01	3,447.68
8.00	1.52	1.29	8.31	1.82	41.29	0.04	4,592.53	0.01	0.01	4,596.91
-	-	-	-	-	-	-	-	-	-	-
2.00	0.38	0.32	2.08	0.45	10.32	0.01	1,148.13	0.00	0.00	1,149.23
2.00	0.38	0.32	2.08	0.45	10.32	0.01	1,148.13	0.00	0.00	1,149.23
-	-	-	-	-	-	-	-	-	-	-
332.00	1.73	0.96	139.83	4.17	16.72	0.16	15,874.66	3.81	3.50	17,040.04
387.00	**5.15**	**3.87**	**158.54**	**8.26**	**109.62**	**0.26**	**26,207.85**	**3.84**	**3.53**	**27,383.09**

Month 17 Daily Emissions (lb/day)										
Quantity Mo 17	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
5.00	-	-	-	-	-	-	-	-	-	-
10.00	-	-	-	-	-	-	-	-	-	-
6.00	-	-	-	-	-	-	-	-	-	-
11.00	-	-	-	-	-	-	-	-	-	-
5.00	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
6.00	1.14	0.97	6.23	1.36	30.97	0.03	3,444.40	0.01	0.01	3,447.68
8.00	1.52	1.29	8.31	1.82	41.29	0.04	4,592.53	0.01	0.01	4,596.91
-	-	-	-	-	-	-	-	-	-	-
2.00	0.38	0.32	2.08	0.45	10.32	0.01	1,148.13	0.00	0.00	1,149.23
2.00	0.38	0.32	2.08	0.45	10.32	0.01	1,148.13	0.00	0.00	1,149.23
-	-	-	-	-	-	-	-	-	-	-
325.00	1.70	0.94	136.88	4.08	16.37	0.16	15,539.96	3.73	3.43	16,680.76
380.00	**5.11**	**3.85**	**155.59**	**8.17**	**109.27**	**0.26**	**25,873.14**	**3.76**	**3.46**	**27,023.81**

Month 33 Daily Emissions (lb/day)										
Quantity Mo 33	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
7.00	-	-	-	-	-	-	-	-	-	-
6.00	-	-	-	-	-	-	-	-	-	-
11.00	-	-	-	-	-	-	-	-	-	-
1.00	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
6.00	1.14	0.97	6.23	1.36	30.97	0.03	3,444.40	0.01	0.01	3,447.68
8.00	1.52	1.29	8.31	1.82	41.29	0.04	4,592.53	0.01	0.01	4,596.91
21.00	3.98	3.39	21.82	4.78	108.38	0.12	12,055.38	0.04	0.03	12,066.89
2.00	0.38	0.32	2.08	0.45	10.32	0.01	1,148.13	0.00	0.00	1,149.23
2.00	0.38	0.32	2.08	0.45	10.32	0.01	1,148.13	0.00	0.00	1,149.23
-	-	-	-	-	-	-	-	-	-	-
190.00	0.99	0.55	80.02	2.38	9.57	0.09	9,084.90	2.18	2.00	9,751.83
254.00	**8.39**	**6.85**	**120.55**	**11.26**	**210.85**	**0.31**	**31,473.47**	**2.25**	**2.07**	**32,161.78**

Month 34 Daily Emissions (lb/day)										
Quantity Mo 34	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
7.00	-	-	-	-	-	-	-	-	-	-
6.00	-	-	-	-	-	-	-	-	-	-
11.00	-	-	-	-	-	-	-	-	-	-
1.00	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
6.00	1.14	0.97	6.23	1.36	30.97	0.03	3,444.40	0.01	0.01	3,447.68
8.00	1.52	1.29	8.31	1.82	41.29	0.04	4,592.53	0.01	0.01	4,596.91
21.00	3.98	3.39	21.82	4.78	108.38	0.12	12,055.38	0.04	0.03	12,066.89
2.00	0.38	0.32	2.08	0.45	10.32	0.01	1,148.13	0.00	0.00	1,149.23
2.00	0.38	0.32	2.08	0.45	10.32	0.01	1,148.13	0.00	0.00	1,149.23
-	-	-	-	-	-	-	-	-	-	-
190.00	0.99	0.55	80.02	2.38	9.57	0.09	9,084.90	2.18	2.00	9,751.83
254.00	**8.39**	**6.85**	**120.55**	**11.26**	**210.85**	**0.31**	**31,473.47**	**2.25**	**2.07**	**32,161.78**

Month 35 Daily Emissions (lb/day)										
Quantity Mo 35	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
7.00	-	-	-	-	-	-	-	-	-	-
6.00	-	-	-	-	-	-	-	-	-	-
11.00	-	-	-	-	-	-	-	-	-	-
1.00	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
6.00	1.14	0.97	6.23	1.36	30.97	0.03	3,444.40	0.01	0.01	3,447.68
8.00	1.52	1.29	8.31	1.82	41.29	0.04	4,592.53	0.01	0.01	4,596.91
21.00	3.98	3.39	21.82	4.78	108.38	0.12	12,055.38	0.04	0.03	12,066.89
2.00	0.38	0.32	2.08	0.45	10.32	0.01	1,148.13	0.00	0.00	1,149.23
2.00	0.38	0.32	2.08	0.45	10.32	0.01	1,148.13	0.00	0.00	1,149.23
-	-	-	-	-	-	-	-	-	-	-
190.00	0.99	0.55	80.02	2.38	9.57	0.09	9,084.90	2.18	2.00	9,751.83
254.00	**8.39**	**6.85**	**120.55**	**11.26**	**210.85**	**0.31**	**31,473.47**	**2.25**	**2.07**	**32,161.78**

Month 36 Daily Emissions (lb/day)										
Quantity Mo 36	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
7.00	-	-	-	-	-	-	-	-	-	-
6.00	-	-	-	-	-	-	-	-	-	-
11.00	-	-	-	-	-	-	-	-	-	-
1.00	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
6.00	1.14	0.97	6.23	1.36	30.97	0.03	3,444.40	0.01	0.01	3,447.68
8.00	1.52	1.29	8.31	1.82	41.29	0.04	4,592.53	0.01	0.01	4,596.91
21.00	3.98	3.39	21.82	4.78	108.38	0.12	12,055.38	0.04	0.03	12,066.89
2.00	0.38	0.32	2.08	0.45	10.32	0.01	1,148.13	0.00	0.00	1,149.23
2.00	0.38	0.32	2.08	0.45	10.32	0.01	1,148.13	0.00	0.00	1,149.23
-	-	-	-	-	-	-	-	-	-	-
153.00	0.80	0.44	64.44	1.92	7.71	0.07	7,315.73	1.76	1.61	7,852.79
217.00	**8.20**	**6.74**	**104.96**	**10.79**	**208.99**	**0.29**	**29,704.30**	**1.82**	**1.68**	**30,262.74**

Month 37 Daily Emissions (lb/day)										
Quantity Mo 37	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
2.00	-	-	-	-	-	-	-	-	-	-
6.00	-	-	-	-	-	-	-	-	-	-
11.00	-	-	-	-	-	-	-	-	-	-
1.00	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
6.00	1.14	0.97	6.23	1.36	30.97	0.03	3,444.40	0.01	0.01	3,447.68
8.00	1.52	1.29	8.31	1.82	41.29	0.04	4,592.53	0.01	0.01	4,596.91
21.00	3.98	3.39	21.82	4.78	108.38	0.12	12,055.38	0.04	0.03	12,066.89
2.00	0.38	0.32	2.08	0.45	10.32	0.01	1,148.13	0.00	0.00	1,149.23
2.00	0.38	0.32	2.08	0.45	10.32	0.01	1,148.13	0.00	0.00	1,149.23
-	-	-	-	-	-	-	-	-	-	-
153.00	0.80	0.44	64.44	1.92	7.71	0.07	7,315.73	1.76	1.61	7,852.79
212.00	**8.20**	**6.74**	**104.96**	**10.79**	**208.99**	**0.29**	**29,704.30**	**1.82**	**1.68**	**30,262.74**

Month 18 Daily Emissions (lb/day)										
Quantity Mo 18	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
5.00	-	-	-	-	-	-	-	-	-	-
10.00	-	-	-	-	-	-	-	-	-	-
6.00	-	-	-	-	-	-	-	-	-	-
11.00	-	-	-	-	-	-	-	-	-	-
5.00	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
6.00	1.14	0.97	6.23	1.36	30.97	0.03	3,444.40	0.01	0.01	3,447.68
8.00	1.52	1.29	8.31	1.82	41.29	0.04	4,592.53	0.01	0.01	4,596.91
-	-	-	-	-	-	-	-	-	-	-
2.00	0.38	0.32	2.08	0.45	10.32	0.01	1,148.13	0.00	0.00	1,149.23
2.00	0.38	0.32	2.08	0.45	10.32	0.01	1,148.13	0.00	0.00	1,149.23
-	-	-	-	-	-	-	-	-	-	-
280.00	1.46	0.81	117.93	3.51	14.10	0.14	13,388.27	3.21	2.95	14,371.12
335.00	**4.87**	**3.72**	**136.63**	**7.61**	**107.00**	**0.24**	**23,721.46**	**3.24**	**2.98**	**24,714.17**

Month 19 Daily Emissions (lb/day)										
Quantity Mo 19	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
5.00	-	-	-	-	-	-	-	-	-	-
10.00	-	-	-	-	-	-	-	-	-	-
6.00	-	-	-	-	-	-	-	-	-	-
11.00	-	-	-	-	-	-	-	-	-	-
5.00	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
6.00	1.14	0.97	6.23	1.36	30.97	0.03	3,444.40	0.01	0.01	3,447.68
8.00	1.52	1.29	8.31	1.82	41.29	0.04	4,592.53	0.01	0.01	4,596.91
-	-	-	-	-	-	-	-	-	-	-
2.00	0.38	0.32	2.08	0.45	10.32	0.01	1,148.13	0.00	0.00	1,149.23
2.00	0.38	0.32	2.08	0.45	10.32	0.01	1,148.13	0.00	0.00	1,149.23
-	-	-	-	-	-	-	-	-	-	-
247.00	1.29	0.71	104.03	3.10	12.44	0.12	11,810.37	2.83	2.60	12,677.38
302.00	**4.70**	**3.62**	**122.74**	**7.19**	**105.34**	**0.22**	**22,143.55**	**2.87**	**2.63**	**23,020.43**

Month 20 Daily Emissions (lb/day)										
Quantity Mo 20	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
5.00	-	-	-	-	-	-	-	-	-	-
10.00	-	-	-	-	-	-	-	-	-	-
6.00	-	-	-	-	-	-	-	-	-	-
11.00	-	-	-	-	-	-	-	-	-	-
5.00	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
6.00	1.14	0.97	6.23	1.36	30.97	0.03	3,444.40	0.01	0.01	3,447.68
8.00	1.52	1.29	8.31	1.82	41.29	0.04	4,592.53	0.01	0.01	4,596.91
-	-	-	-	-	-	-	-	-	-	-
2.00	0.38	0.32	2.08	0.45	10.32	0.01	1,148.13	0.00	0.00	1,149.23
2.00	0.38	0.32	2.08	0.45	10.32	0.01	1,148.13	0.00	0.00	1,149.23
-	-	-	-	-	-	-	-	-	-	-
226.00	1.18	0.65	95.19	2.84	11.38	0.11	10,806.25	2.59	2.38	11,599.55
281.00	**4.59**	**3.56**	**113.89**	**6.93**	**104.28**	**0.21**	**21,139.43**	**2.62**	**2.41**	**21,942.60**

Month 38 Daily Emissions (lb/day)										
Quantity Mo 38	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
2.00	-	-	-	-	-	-	-	-	-	-
6.00	-	-	-	-	-	-	-	-	-	-
11.00	-	-	-	-	-	-	-	-	-	-
1.00	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
6.00	1.14	0.97	6.23	1.36	30.97	0.03	3,444.40	0.01	0.01	3,447.68
8.00	1.52	1.29	8.31	1.82	41.29	0.04	4,592.53	0.01	0.01	4,596.91
21.00	3.98	3.39	21.82	4.78	108.38	0.12	12,055.38	0.04	0.03	12,066.89
2.00	0.38	0.32	2.08	0.45	10.32	0.01	1,148.13	0.00	0.00	1,149.23
2.00	0.38	0.32	2.08	0.45	10.32	0.01	1,148.13	0.00	0.00	1,149.23
-	-	-	-	-	-	-	-	-	-	-
153.00	0.80	0.44	64.44	1.92	7.71	0.07	7,315.73	1.76	1.61	7,852.79
212.00	**8.20**	**6.74**	**104.96**	**10.79**	**208.99**	**0.29**	**29,704.30**	**1.82**	**1.68**	**30,262.74**

Month 39 Daily Emissions (lb/day)										
Quantity Mo 39	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
2.00	-	-	-	-	-	-	-	-	-	-
6.00	-	-	-	-	-	-	-	-	-	-
11.00	-	-	-	-	-	-	-	-	-	-
1.00	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
6.00	1.14	0.97	6.23	1.36	30.97	0.03	3,444.40	0.01	0.01	3,447.68
8.00	1.52	1.29	8.31	1.82	41.29	0.04	4,592.53	0.01	0.01	4,596.91
21.00	3.98	3.39	21.82	4.78	108.38	0.12	12,055.38	0.04	0.03	12,066.89
2.00	0.38	0.32	2.08	0.45	10.32	0.01	1,148.13	0.00	0.00	1,149.23
2.00	0.38	0.32	2.08	0.45	10.32	0.01	1,148.13	0.00	0.00	1,149.23
-	-	-	-	-	-	-	-	-	-	-
153.00	0.80	0.44	64.44	1.92	7.71	0.07	7,315.73	1.76	1.61	7,852.79
212.00	**8.20**	**6.74**	**104.96**	**10.79**	**208.99**	**0.29**	**29,704.30**	**1.82**	**1.68**	**30,262.74**

Month 40 Daily Emissions (lb/day)										
Quantity Mo 40	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
2.00	-	-	-	-	-	-	-	-	-	-
6.00	-	-	-	-	-	-	-	-	-	-
11.00	-	-	-	-	-	-	-	-	-	-
1.00	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
6.00	1.14	0.97	6.23	1.36	30.97	0.03	3,444.40	0.01	0.01	3,447.68
8.00	1.52	1.29	8.31	1.82	41.29	0.04	4,592.53	0.01	0.01	4,596.91
21.00	3.98	3.39	21.82	4.78	108.38	0.12	12,055.38	0.04	0.03	12,066.89
2.00	0.38	0.32	2.08	0.45	10.32	0.01	1,148.13	0.00	0.00	1,149.23
2.00	0.38	0.32	2.08	0.45	10.32	0.01	1,148.13	0.00	0.00	1,149.23
-	-	-	-	-	-	-	-	-	-	-
152.00	0.79	0.44	64.02	1.91	7.66	0.07	7,267.92	1.74	1.60	7,801.46
211.00	**8.19**	**6.74**	**104.54**	**10.78**	**208.94**	**0.29**	**29,656.49**	**1.81**	**1.67**	**30,211.41**

Month 41 Daily Emissions (lb/day)										
Quantity Mo 41	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
2.00	-	-	-	-	-	-	-	-	-	-
6.00	-	-	-	-	-	-	-	-	-	-
11.00	-	-	-	-	-	-	-	-	-	-
1.00	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
6.00	1.14	0.97	6.23	1.36	30.97	0.03	3,444.40	0.01	0.01	3,447.68
8.00	1.52	1.29	8.31	1.82	41.29	0.04	4,592.53	0.01	0.01	4,596.91
21.00	3.98	3.39	21.82	4.78	108.38	0.12	12,055.38	0.04	0.03	12,066.89
2.00	0.38	0.32	2.08	0.45	10.32	0.01	1,148.13	0.00	0.00	1,149.23
2.00	0.38	0.32	2.08	0.45	10.32	0.01	1,148.13	0.00	0.00	1,149.23
-	-	-	-	-	-	-	-	-	-	-
152.00	0.79	0.44	64.02	1.91	7.66	0.07	7,267.92	1.74	1.60	7,801.46
211.00	**8.19**	**6.74**	**104.54**	**10.78**	**208.94**	**0.29**	**29,656.49**	**1.81**	**1.67**	**30,211.41**

Monthly Comparison of Construction Equipment Emissions:

Month of Contruction	Total Equipment Quantity	Daily Emissions (lb/day) PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e
1	114	3.94	3.25	47.91	5.15	101.17	0.14	14081.43	0.80	0.738	14327.00
2	252	5.16	4.12	98.95	7.32	124.00	0.21	21390.75	2.10	1.935	22034.79
3	317	5.52	4.32	128.01	8.19	127.47	0.24	24690.00	2.90	2.663	25576.24
4	284	5.40	4.25	115.54	7.85	126.76	0.23	23343.86	2.55	2.347	24124.88
5	282	5.40	4.25	115.54	7.85	126.76	0.23	23343.86	2.55	2.347	24124.88
6	381	5.92	4.55	158.08	9.12	131.84	0.28	28173.20	3.71	3.412	29308.75
7	401	6.03	4.60	166.50	9.37	132.85	0.29	29129.51	3.94	3.623	30335.26
8	389	5.59	4.25	160.21	8.79	122.03	0.27	27503.22	3.82	3.514	28672.78
9	392	5.43	4.10	160.86	8.61	117.07	0.27	27120.42	3.87	3.554	28303.46
10	360	5.00	3.79	147.16	7.92	108.26	0.25	24916.84	3.53	3.246	25997.31
11	360	5.00	3.79	147.16	7.92	108.26	0.25	24916.84	3.53	3.246	25997.31
12	360	5.00	3.79	147.16	7.92	108.26	0.25	24916.84	3.53	3.246	25997.31
13	412	5.28	3.94	169.06	8.58	110.88	0.27	27403.23	4.13	3.795	28666.23
14	396	5.19	3.89	162.33	8.37	110.07	0.27	26638.19	3.94	3.626	27845.02
15	402	5.22	3.91	164.85	8.45	110.38	0.27	26925.08	4.01	3.689	28152.97
16	387	5.15	3.87	158.54	8.26	109.62	0.26	26207.85	3.84	3.531	27383.09
17	380	5.11	3.85	155.59	8.17	109.27	0.26	25873.14	3.76	3.457	27023.81
18	335	4.87	3.72	136.63	7.61	107.00	0.24	23721.46	3.24	2.983	24714.17
19	302	4.70	3.62	122.74	7.19	105.34	0.22	22143.55	2.87	2.635	23020.43
20	281	4.59	3.56	113.89	6.93	104.28	0.21	21139.43	2.62	2.413	21942.60
21	267	5.07	4.00	109.85	7.40	118.91	0.22	22048.77	2.44	2.239	22793.91
22	266	5.07	3.99	109.43	7.39	118.86	0.22	22000.96	2.42	2.228	22742.58
23	264	5.07	3.99	109.43	7.39	118.86	0.22	22000.96	2.42	2.228	22742.58
24	264	5.07	3.99	109.43	7.39	118.86	0.22	22000.96	2.42	2.228	22742.58
25	270	5.34	4.22	110.91	7.71	126.20	0.22	22817.90	2.43	2.231	23560.30
26	268	4.77	3.74	107.79	7.03	110.72	0.21	21095.70	2.42	2.226	21836.46
27	267	4.77	3.74	107.79	7.03	110.72	0.21	21095.70	2.42	2.226	21836.46
28	223	4.55	3.62	90.10	6.50	108.60	0.19	19087.46	1.94	1.783	19680.79
29	219	4.91	3.92	92.07	6.93	118.40	0.20	20176.71	1.94	1.786	20771.09
30	242	9.07	7.47	114.88	11.93	231.68	0.32	32776.72	1.98	1.822	33383.13
31	235	8.53	7.01	111.92	11.28	216.99	0.30	31142.84	1.98	1.817	31747.69
32	230	8.26	6.78	110.44	10.95	209.64	0.30	30325.90	1.97	1.815	30929.97
33	254	8.39	6.85	120.55	11.26	210.85	0.31	31473.47	2.25	2.068	32161.78
34	254	8.39	6.85	120.55	11.26	210.85	0.31	31473.47	2.25	2.068	32161.78
35	254	8.39	6.85	120.55	11.26	210.85	0.31	31473.47	2.25	2.068	32161.78
36	217	8.20	6.74	104.96	10.79	208.99	0.29	29704.30	1.82	1.678	30262.74
37	212	8.20	6.74	104.96	10.79	208.99	0.29	29704.30	1.82	1.678	30262.74
38	212	8.20	6.74	104.96	10.79	208.99	0.29	29704.30	1.82	1.678	30262.74
39	212	8.20	6.74	104.96	10.79	208.99	0.29	29704.30	1.82	1.678	30262.74
40	211	8.19	6.74	104.54	10.78	208.94	0.29	29656.49	1.81	1.667	30211.41
41	211	8.19	6.74	104.54	10.78	208.94	0.29	29656.49	1.81	1.667	30211.41
MAX VALUE (lb/day)	**412**	**9.07**	**7.47**	**169.06**	**11.93**	**231.68**	**0.32**	**32776.7**	**4.13**	**3.795**	**33383.1**

Months for Annual Contruction		Annual Emissions (ton/year) PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e
1	**12**	0.82	0.64	20.71	1.25	18.65	0.038	3815.85	0.48	0.4403	3962.40
2	**13**	0.84	0.65	22.29	1.29	18.78	0.040	3989.03	0.52	0.4800	4148.81
3	**14**	0.84	0.64	23.11	1.31	18.60	0.040	4057.25	0.55	0.5020	4224.34
4	**15**	0.84	0.64	23.59	1.31	18.37	0.041	4086.30	0.56	0.5154	4257.84
5	**16**	0.83	0.63	24.15	1.32	18.15	0.041	4123.54	0.58	0.5308	4300.20
6	**17**	0.83	0.63	24.67	1.32	17.92	0.041	4156.42	0.59	0.5452	4337.88
7	**18**	0.82	0.62	24.39	1.30	17.60	0.041	4098.54	0.59	0.5396	4278.15
8	**19**	0.80	0.60	23.82	1.27	17.24	0.040	4007.73	0.57	0.5268	4183.06
9	**20**	0.79	0.60	23.22	1.25	17.01	0.039	3925.00	0.56	0.5125	4095.57
10	**21**	0.78	0.59	22.55	1.23	17.04	0.038	3859.07	0.54	0.4954	4023.94
11	**22**	0.78	0.60	22.06	1.22	17.17	0.038	3821.16	0.52	0.4821	3981.63
12	**23**	0.78	0.60	21.57	1.22	17.31	0.038	3783.25	0.51	0.4689	3939.32
13	**24**	0.79	0.60	21.08	1.21	17.45	0.037	3745.35	0.50	0.4557	3897.01
14	**25**	0.79	0.61	20.33	1.20	17.65	0.037	3685.74	0.47	0.4353	3830.63
15	**26**	0.78	0.60	19.62	1.18	17.66	0.036	3613.68	0.45	0.4171	3752.52
16	**27**	0.77	0.60	18.88	1.16	17.66	0.035	3537.90	0.43	0.3981	3670.41
17	**28**	0.77	0.60	17.99	1.14	17.65	0.034	3445.34	0.41	0.3754	3570.28
18	**29**	0.76	0.60	17.16	1.12	17.77	0.033	3371.28	0.38	0.3536	3488.99
19	**30**	0.82	0.65	16.88	1.18	19.39	0.034	3489.00	0.37	0.3386	3601.69
20	**31**	0.87	0.69	16.74	1.23	20.84	0.035	3605.99	0.36	0.3279	3715.14
21	**32**	0.92	0.73	16.69	1.29	22.21	0.037	3725.42	0.35	0.3202	3831.98
22	**33**	0.96	0.77	16.83	1.34	23.40	0.038	3847.94	0.35	0.3179	3953.76
23	**34**	1.00	0.81	16.98	1.39	24.60	0.039	3971.08	0.34	0.3159	4076.21
24	**35**	1.05	0.85	17.12	1.44	25.80	0.040	4094.22	0.34	0.3138	4198.66
25	**36**	1.09	0.88	17.06	1.48	26.97	0.041	4194.37	0.33	0.3066	4296.42
26	**37**	1.12	0.91	16.99	1.52	28.04	0.042	4283.89	0.33	0.2994	4383.55
27	**38**	1.17	0.95	16.95	1.57	29.32	0.043	4395.80	0.32	0.2923	4493.09
28	**39**	1.21	0.99	16.91	1.62	30.60	0.044	4507.71	0.31	0.2852	4602.64
29	**40**	1.26	1.03	17.10	1.67	31.90	0.045	4645.11	0.31	0.2837	4739.53
30	**41**	1.30	1.07	17.26	1.72	33.08	0.046	4768.35	0.31	0.2822	4862.26
MAX VALUE (ton/year)		**1.30**	**1.07**	**24.67**	**1.72**	**33.08**	**0.05**	**4768.35**	**0.59**	**0.5452**	**4862.26**

Monthly Comparison of Construction Equipment Emissions (onsite and offsite combined)

Daily Emissions (lb/day) PM10	PM2.5	CO	ROG	NOx	SO2	CO2	CH4	N2O	CO2e
11.47	10.14	133.96	26.14	227.58	0.28	27321.68	2.89	0.82	27636.63
21.90	19.43	298.53	54.07	417.52	0.53	51843.74	7.21	2.10	52645.88
20.79	18.28	327.20	51.30	398.27	0.55	53481.11	8.14	2.87	54542.25
21.28	18.80	319.90	52.89	410.04	0.55	53184.44	7.98	2.54	54137.83
21.51	19.02	330.14	53.94	411.81	0.55	53359.39	8.35	2.53	54320.35
22.27	19.52	408.18	55.69	420.59	0.60	59396.99	10.54	3.67	60755.32
23.36	20.48	418.81	58.63	437.87	0.63	61967.43	10.81	3.89	63401.06
22.10	19.38	404.33	56.00	405.15	0.59	58024.17	10.51	3.78	59415.70
22.07	19.35	371.43	57.06	390.93	0.59	56440.72	9.63	3.82	57827.08
21.45	18.85	354.47	55.53	380.02	0.56	53816.89	9.22	3.49	55092.96
20.52	18.00	339.56	53.29	359.69	0.54	51960.20	8.81	3.49	53227.61
20.52	18.00	339.56	53.29	359.69	0.54	51960.20	8.81	3.49	53227.61
20.57	17.94	361.50	53.01	360.11	0.57	54610.18	9.34	4.08	56069.84
21.04	18.41	393.40	53.43	379.15	0.57	55764.05	10.26	3.90	57187.18
21.59	18.90	429.45	54.63	391.47	0.58	57452.04	11.27	3.96	58917.30
21.02	18.40	403.58	53.33	380.73	0.57	55583.60	10.57	3.79	56981.98
20.83	18.25	391.67	52.63	378.07	0.56	54919.45	10.22	3.72	56286.15
19.19	16.83	343.64	47.87	350.11	0.51	50011.31	8.89	3.21	51193.37
18.73	16.46	296.91	46.39	341.87	0.49	47317.87	7.56	2.84	48357.21
18.48	16.27	285.59	45.49	339.56	0.48	46046.61	7.26	2.60	47006.39
19.27	17.00	283.62	46.60	364.34	0.49	47884.73	7.10	2.42	48783.66
19.27	17.00	283.15	46.59	364.29	0.49	47829.28	7.09	2.41	48724.47
18.75	16.53	278.69	44.70	356.67	0.49	46986.55	7.03	2.41	47880.20
18.53	16.33	276.53	43.86	354.39	0.48	46760.14	6.96	2.41	47652.21
20.66	18.27	292.71	48.90	392.76	0.52	50406.68	7.30	2.41	51306.93
20.57	18.22	292.49	49.03	382.51	0.51	49054.05	7.38	2.40	49954.45
19.89	17.59	288.09	47.44	373.85	0.50	48311.48	7.29	2.40	49209.89
19.58	17.40	267.76	46.64	370.70	0.48	45872.40	6.78	1.93	46613.77
11.05	9.53	192.98	23.96	222.57	0.32	32144.52	4.68	1.93	32842.43
14.03	11.98	205.39	26.08	315.82	0.42	43136.94	4.35	1.97	43839.32
12.41	10.53	193.28	22.25	288.98	0.39	40371.05	4.09	1.97	41066.52
11.06	9.32	179.32	18.81	268.49	0.37	38255.56	3.56	1.96	38938.98
11.21	9.40	190.71	19.20	269.82	0.39	39586.36	3.85	2.23	40359.49
10.60	8.84	186.16	17.59	253.26	0.37	37978.86	3.70	2.23	38748.93
10.35	8.62	212.80	16.88	249.12	0.36	37812.29	4.48	2.23	38598.63
10.13	8.49	195.24	16.28	247.07	0.34	35760.64	4.03	1.82	36408.68
9.57	7.97	190.12	15.16	237.42	0.33	34801.79	3.93	1.82	35447.75
9.57	7.97	190.12	15.16	237.42	0.33	34801.79	3.93	1.82	35447.75
9.57	7.97	190.12	15.16	237.42	0.33	34801.79	3.93	1.82	35447.75
9.56	7.97	189.65	15.15	237.36	0.33	34746.34	3.92	1.81	35388.56
9.56	7.97	189.65	15.15	237.36	0.33	34746.34	3.92	1.81	35388.56
23.36	**20.48**	**429.45**	**58.63**	**437.87**	**0.63**	**61967.43**	**11.27**	**4.08**	**63401.06**

Annual Emissions (ton/year) PM10	PM2.5	CO	ROG	NOx	SO2	CO2	CH4	N2O	CO2e
3.24	2.85	52.60	8.16	60.05	0.08	8225.84	1.34	0.47	8400.99
3.359	2.952	55.56	8.51	61.77	0.0884	8580.59	1.42	0.52	8770.63
3.35	2.94	56.79	8.50	61.27	0.0890	8631.56	1.46	0.54	8829.66
3.358	2.946	58.12	8.546	61.18	0.0894	8683.18	1.50	0.55	8886.54
3.35	2.94	59.21	8.552	60.80	0.0897	8714.37	1.54	0.57	8923.51
3.35	2.93	60.01	8.53	60.36	0.0899	8734.65	1.56	0.59	8949.07
3.31	2.90	59.17	8.43	59.45	0.0887	8612.63	1.54	0.58	8824.76
3.25	2.84	57.58	8.27	58.20	0.0869	8422.19	1.50	0.57	8629.19
3.20	2.80	56.04	8.14	57.35	0.0854	8266.48	1.45	0.55	8467.87
3.16	2.77	54.90	8.00	57.00	0.08	8155.25	1.42	0.53	8350.31
3.13	2.75	53.97	7.89	56.80	0.08	8077.41	1.39	0.52	8267.52
3.11	2.73	53.18	7.77	56.76	0.08	8012.76	1.37	0.50	8198.00
3.08	2.71	52.36	7.65	56.69	0.08	7945.16	1.35	0.49	8125.52
3.09	2.71	51.47	7.60	57.11	0.08	7890.51	1.32	0.47	8063.60
3.08	2.71	50.15	7.54	57.16	0.08	7803.28	1.28	0.45	7969.58
3.06	2.69	48.32	7.45	56.93	0.08	7684.45	1.23	0.43	7843.38
3.04	2.68	46.55	7.36	56.80	0.08	7558.21	1.18	0.41	7708.59
2.91	2.57	43.97	6.99	54.78	0.08	7262.13	1.11	0.38	7403.82
2.84	2.50	42.17	6.70	54.33	0.07	7172.77	1.05	0.37	7308.22
2.76	2.43	40.82	6.39	53.64	0.07	7082.46	1.00	0.35	7213.44
2.67	2.34	39.44	6.04	52.72	0.07	6981.17	0.96	0.35	7108.57
2.56	2.24	38.23	5.69	51.49	0.07	6873.30	0.91	0.34	6999.05
2.45	2.13	36.97	5.31	50.05	0.07	6745.24	0.87	0.34	6869.37
2.34	2.03	36.12	4.95	48.65	0.07	6625.97	0.84	0.34	6748.71
2.23	1.93	35.06	4.59	47.25	0.06	6482.98	0.80	0.33	6602.54
2.09	1.79	33.73	4.15	45.23	0.06	6280.12	0.76	0.32	6396.37
1.94	1.66	32.40	3.71	43.35	0.06	6094.84	0.71	0.32	6207.79
1.81	1.53	31.12	3.29	41.57	0.06	5919.21	0.67	0.31	6028.88
1.68	1.41	30.11	2.88	39.84	0.06	5774.57	0.63	0.31	5882.95
1.66	1.39	30.06	2.77	40.03	0.06	5808.40	0.62	0.31	5916.05
3.36	**2.95**	**60.01**	**8.55**	**61.77**	**0.0899**	**8734.65**	**1.56**	**0.59**	**8949.07**

Combustion Exhaust Emissions Off-site (annual)

To be consistency to on-site emissions, months 2-13 was used to represent the annual construction off-site (on-road) emissions.
Construction Assumptions - 26 days per month

Equipment	Number of Vehicles per year	Hours/Day	Emission rate per piece of equipment (lb/hr)										Annual Emissions (ton/year)										Number of Vehicles (entire construction period)	entire construction period emissions (ton)									
			PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e		PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e
Vehicles with Onroad Engines for Emissions Estimates																																	
Concrete Delivery Truck for general construction	12	12	0.007	0.006	0.041	0.009	0.204	0.000	22.693	0.000	0.000	22.714	0.01	0.01	0.08	0.02	0.38	0.00	42.48	0.00	0.00	42.52	14	0.02	0.01	0.09	0.02	0.45	0.00	49.56	0.00	0.00	49.61
Concrete Delivery Truck for bridge	0	12	0.007	0.006	0.041	0.009	0.204	0.000	22.693	0.000	0.000	22.714	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9	0.01	0.01	0.06	0.01	0.29	0.00	31.86	0.00	0.00	31.89
Concrete Pump Truck for bridge	0	12	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dump Truck	65	12	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	151	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Flatbed Truck	118	12	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	338	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Staff & Security Truck	72	24	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	246	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pickup Truck	132	12	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	451	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water and Road Preparation Materials Truck	75	12	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	158	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Materials Delivery Truck for general cons	24	24	0.004	0.003	0.021	0.004	0.102	0.000	11.346	0.000	0.000	11.357	0.03	0.02	0.15	0.03	0.76	0.00	84.96	0.00	0.00	85.04	24	0.03	0.02	0.15	0.03	0.76	0.00	84.96	0.00	0.00	85.04
General Materials Delivery Truck for bridge	0	24	0.004	0.003	0.021	0.004	0.102	0.000	11.346	0.000	0.000	11.357	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	22	0.03	0.02	0.14	0.03	0.70	0.00	77.88	0.00	0.00	77.96
Steel Piling Delivery Truck	13	24	0.008	0.007	0.043	0.009	0.215	0.000	23.919	0.000	0.000	23.942	0.03	0.03	0.18	0.04	0.87	0.00	97.02	0.00	0.00	97.11	28	0.07	0.06	0.38	0.08	1.88	0.00	208.96	0.00	0.00	209.16
PV Panels Delivery Truck	72	24	0.008	0.007	0.043	0.009	0.215	0.000	23.919	0.000	0.000	23.942	0.18	0.15	0.97	0.21	4.83	0.01	537.33	0.00	0.00	537.84	246	0.61	0.52	3.32	0.73	16.51	0.02	1835.86	0.01	0.01	1837.62
Tracker Steel Delivery Truck	96	24	0.008	0.007	0.043	0.009	0.215	0.000	23.919	0.000	0.000	23.942	0.24	0.20	1.30	0.28	6.44	0.01	716.43	0.00	0.00	717.12	328	0.81	0.69	4.43	0.97	22.01	0.02	2447.82	0.01	0.01	2450.15
Suncatcher Delivery Truck	0	24	0.008	0.007	0.043	0.009	0.215	0.000	23.919	0.000	0.000	23.942	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	252	0.62	0.53	3.40	0.75	16.91	0.02	1880.64	0.01	0.01	1882.44
Electrical and Control Systems Delivery Truck	24	24	0.008	0.007	0.043	0.009	0.215	0.000	23.919	0.000	0.000	23.942	0.06	0.05	0.32	0.07	1.61	0.00	179.11	0.00	0.00	179.28	82	0.20	0.17	1.11	0.24	5.50	0.01	611.95	0.00	0.00	612.54
Tracker Delivery Truck	24	24	0.008	0.007	0.043	0.009	0.215	0.000	23.919	0.000	0.000	23.942	0.06	0.05	0.32	0.07	1.61	0.00	179.11	0.00	0.00	179.28	82	0.20	0.17	1.11	0.24	5.50	0.01	611.95	0.00	0.00	612.54
Water Delivery Trucks	0	24	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Passenger Vehicles	3463	24	0.000	0.000	0.018	0.001	0.002	0.000	1.992	0.000	0.000	2.139	0.23	0.13	18.96	0.57	2.27	0.02	2152.59	0.52	0.47	2310.62	9401	0.64	0.35	51.47	1.53	6.16	0.06	5843.64	1.40	1.29	6272.63
												Total	**0.84**	**0.65**	**22.29**	**1.29**	**18.78**	**0.04**	**3989.03**	**0.52**	**0.48**	**4148.81**		**3.23**	**2.56**	**65.67**	**4.64**	**76.65**	**0.13**	**13685.10**	**1.43**	**1.31**	**14121.57**

Number of Vehicles per year = sum of monthly daily maximum vehicle usage for the peak 12 months
delivery trucks can arrive at the site anytime during the day or night

Calico Solar
Fugitive Dust Emissions (offsite)
To be consistent to on-site emissions, months 7 was used to represent the daily/month construction off-site (on-road) emissions.
To be consistent to on-site emissions, months 2-13 was used to represent the annual construction off-site (on-road) emissions.

Travel on paved road

$E = [k * (sL/2)^{0.91} * (W)^{1.02}] (1 - P/4N)$

Source: EPA AP-42 Section 13.2.1 Paved Roads Equation 2 (Jan. 2011 version)
E = particulate emission factor (lb/VMT),
k = particle size multiplier for particle size range and units of interest (lb/VMT),
0.02 sL = road surface silt loading (grams per square meter) (g/m^2), Freeway Local Streets & Freeways (emission inventory code: 640-641-5400-0000), July 1997
W = average weight (tons) of the vehicles traveling the road, and

constants

	$PM_{2.5}$	PM_{10}
k	0.0024	0.016

23 P = Mean number of days per year with at least 0.01 inches of precipitation (from Daggett FAA Airport Station)
365 N = number of days in the year (averaging period)

Vehicle Type	Number of Vehicles (month 7)	Number of Vehicles per year (months 2-13)	Max Daily Offsite Round-trip Distance per Vehicle within MDAQMD Jurisdictional Area (mile/day)	Max Daily VMT (all vehicles)	Max Annual VMT (all vehicles)	Mean Vehicle Weight (tons)	Max. Operating Hours / Day	Max. Operating Days / Month	$PM_{2.5}$ EF (lbs/VMT)	PM_{10} EF (lbs/VMT)
Vehicles with Onroad Engines for Emissions Estimates										
Concrete Delivery Truck for general construction	0	12	74	0	23088	20	12	26	0.001	0.005
Concrete Delivery Truck for bridge	0	0	74	0	0	20	12	26	0.001	0.005
Concrete Pump Truck for bridge	0	0	0	0	0	20	12	26	0.001	0.005
Dump Truck	5	65	0	0	0	20	12	26	0.001	0.005
Flatbed Truck	10	118	0	0	0	10	12	26	0.000	0.002
Staff & Security Truck	6	72	0	0	0	2.25	24	26	0.000	0.001
Pickup Truck	11	132	0	0	0	4	12	26	0.000	0.001
Water and Road Preparation Materials Truck	5	75	0	0	0	20	12	26	0.001	0.005
General Materials Delivery Truck for general construc	3	24	74	222	46176	20	24	26	0.001	0.005
General Materials Delivery Truck for bridge	0	0	74	0	0	20	24	26	0.001	0.005
Steel Piling Delivery Truck	3	13	156	468	52728	20	24	26	0.001	0.005
PV Panels Delivery Truck	6	72	156	936	292032	20	24	26	0.001	0.005
Tracker Steel Delivery Truck	8	96	156	1248	389376	20	24	26	0.001	0.005
Suncatcher Delivery Truck	0	0	156	0	0	20	24	26	0.001	0.005
Electrical and Control Systems Delivery Truck	2	24	156	312	97344	20	24	26	0.001	0.005
Tracker Delivery Truck	2	24	156	312	97344	20	24	26	0.001	0.005
Water Delivery Trucks	0	0	0	0	0	0	24	26	0.000	0.000
Worker Passenger Vehicles	340	3463	74	25160	6662812	2	24	26	0.000	0.000

Vehicle Type	Watering Control Efficiency		PM_{10} Emissions (lb/hr)		PM_{10} Emissions (lb/day)		% of daily emissions	PM_{10} Emissions (tons/year)		$PM_{2.5}$ Emissions (lb/hr)		$PM_{2.5}$ Emissions (lb/day)		$PM_{2.5}$ Emissions (tons/year)	
	Unmitigated	Mitigated	Unmitigated	Mitigated	Unmitigated	Mitigated		Unmitigated	Mitigated	Unmitigated	Mitigated	Unmitigated	Mitigated	Unmitigated	Mitigated
Vehicles with Onroad Engines for Emissions Estimates															
Concrete Delivery Truck for general construction	0%	0%	0.00	0.00	0.00	0.00	0.00%	0.06	0.06	0.00	0.00	0.00	0.00	0.01	0.01
Concrete Delivery Truck for bridge	0%	0%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Concrete Pump Truck for bridge	0%	0%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dump Truck	0%	0%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Flatbed Truck	0%	0%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Staff & Security Truck	0%	0%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pickup Truck	0%	0%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water and Road Preparation Materials Truck	0%	0%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Materials Delivery Truck for general construc	0%	0%	0.05	0.05	1.12	1.12	3.76%	0.12	0.12	0.01	0.01	0.17	0.17	0.02	0.02
General Materials Delivery Truck for bridge	0%	0%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Steel Piling Delivery Truck	0%	0%	0.10	0.10	2.37	2.37	7.93%	0.13	0.13	0.01	0.01	0.36	0.36	0.02	0.02
PV Panels Delivery Truck	0%	0%	0.20	0.20	4.74	4.74	15.86%	0.74	0.74	0.03	0.03	0.71	0.71	0.11	0.11
Tracker Steel Delivery Truck	0%	0%	0.26	0.26	6.32	6.32	21.15%	0.99	0.99	0.04	0.04	0.95	0.95	0.15	0.15
Suncatcher Delivery Truck	0%	0%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Electrical and Control Systems Delivery Truck	0%	0%	0.07	0.07	1.58	1.58	5.29%	0.25	0.25	0.01	0.01	0.24	0.24	0.04	0.04
Tracker Delivery Truck	0%	0%	0.07	0.07	1.58	1.58	5.29%	0.25	0.25	0.01	0.01	0.24	0.24	0.04	0.04
Water Delivery Trucks	0%	0%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Passenger Vehicles	0%	0%	0.51	0.51	12.16	12.16	40.72%	1.61	1.61	0.08	0.08	1.82	1.82	0.24	0.24
TOTAL Fugitive emissions for vehicle travel offsite paved roads			**1.24**	**1.24**	**29.87**	**29.87**		**4.14**	**4.14**	**0.19**	**0.19**	**4.48**	**4.48**	**0.62**	**0.62**

Number of Vehicles per year = sum of monthly daily maximum vehicle usage for the peak 12 months
delivery trucks can arrive at the site anytime during the day or night

Calico Solar Project
Appendix B
Operational Emissions
(Feb. 15, 2011)

Table B-4
Estimated Daily Maximum Operational Emissions of Criteria Pollutants(lbs/day)

Activity	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_x
On-Site Operational Emissions						
On-Site Combustion Emissions						
Diesel Generator	0.01	0.01	0.10	0.04	1.14	0.03
Maintenance & Security Vehicles and Equipment	0.33	0.27	96.75	17.02	5.21	0.13
Worker Vehicles	0.09	0.06	3.67	0.22	0.34	0.01
Visitor Cars and Delivery Trucks	0.03	0.03	0.56	0.13	0.57	0.00
Subtotal of On-site Combustion Emissions	**0.46**	**0.38**	**101.08**	**17.42**	**7.25**	**0.17**
On-Site Fugitive Emissions						
Maintenance & Security Vehicles and Equipment	236.26	28.13				
Worker Vehicles	2.34	0.57				
Visitor Cars and Delivery Trucks	0.74	0.18				
Gasoline Tank				5.49		
Subtotal of On-Site Fugitive Emissions	**239.34**	**28.88**	**0.00**	**5.49**	**0.00**	**0.00**
Subtotal of On-Site Emissions	**239.80**	**29.27**	**101.08**	**22.92**	**7.25**	**0.17**
Off-Site On-Road Emissions						
Off-Site Combustion Emissions						
Worker Vehicles	0.65	0.36	31.83	0.85	3.67	0.06
Visitor Cars and Delivery Trucks	0.44	0.33	7.50	0.54	8.81	0.02
Subtotal of Off-Site Combustion Emissions	**1.09**	**0.69**	**39.34**	**1.39**	**12.48**	**0.09**
Off-Site Paved Road Fugitive Emissions						
Worker Vehicles	7.98	1.96				
Visitor Cars and Delivery Trucks	4.84	1.19				
Subtotal of Off-Site Fugitive Emissions	**12.82**	**3.15**				
Subtotal of Off-Site Emissions	**13.91**	**3.83**	**39.34**	**1.39**	**12.48**	**0.09**
Total Maximum Emissions	**253.71**	**33.10**	**140.41**	**24.30**	**19.74**	**0.26**

Table B-5
Estimated Annual Maximum Operational Emissions of Criteria Pollutants (tons/year)

Activity	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_x
On-Site Operational Emissions						
On-Site Combustion Emissions						
Diesel Generator	0.0001	0.0001	0.0006	0.0002	0.0068	0.0002
Maintenance & Security Vehicles and Equipment	0.05	0.04	14.10	2.39	0.83	0.02
Worker Vehicles	0.02	0.01	0.66	0.04	0.06	0.00
Visitor Cars and Delivery Trucks	0.00	0.00	0.05	0.01	0.02	0.00
Subtotal of On-site Combustion Emissions	**0.06**	**0.05**	**14.81**	**2.44**	**0.92**	**0.02**
On-Site Fugitive Emissions						
Maintenance & Security Vehicles and Equipment	31.95	3.90				
Worker Vehicles	0.42	0.10				
Visitor Cars and Delivery Trucks	0.04	0.01				
Gasoline Tank				1.00		
Subtotal of On-Site Fugitive Emissions	**32.41**	**4.01**	**0.00**	**1.00**	**0.00**	**0.00**
Subtotal of On-Site Emissions	**32.47**	**4.07**	**14.81**	**3.44**	**0.92**	**0.02**
Off-Site On-Road Emissions						
Off-Site Combustion Emissions						
Worker Vehicles	0.12	0.06	5.73	0.15	0.66	0.01
Visitor Cars and Delivery Trucks	0.02	0.02	0.79	0.03	0.33	0.00
Subtotal of Off-Site Combustion Emissions	**0.14**	**0.08**	**6.52**	**0.18**	**0.99**	**0.01**
Off-Site Paved Road Fugitive Emissions						
Worker Vehicles	1.44	0.35				
Visitor Cars and Delivery Trucks	0.28	0.07				
Subtotal of Off-Site Fugitive Emissions	**1.71**	**0.42**				
Subtotal of Off-Site Emissions	**1.85**	**0.50**	**6.52**	**0.18**	**0.99**	**0.01**
Total Maximum Emissions	**34.33**	**4.57**	**21.33**	**3.62**	**1.91**	**0.03**

Table B-5

Estimated Annual Maximum Operational Greenhouse Gases Emissions (metric tonnes/year)

Activity	CO_2	CH_4	N_2O	SF_6	CO_2e
On-Site Operational Emissions					
On-Site Combustion Emissions					
Diesel Generator	0.81	0.00	0.00	0.00	0.82
Maintenance & Security Vehicles and Equipment	1,140.06	0.21	0.07	0.00	1,072.72
Worker Vehicles	145.01	0.01	0.01	0.00	149.13
Visitor Cars and Delivery Trucks	10.91	0.00	0.00	0.00	11.16
Potential sulfur hexafluoride (SF_6) emissions leakage emissions from proposed circuit breakers and other transmissions system equipment				0.02	384.42
Subtotal of On-Site Emissions	**1,296.79**	**0.22**	**0.08**	**0.02**	**1,618.24**
Off-Site On-Road Emissions					
Off-Site Combustion Emissions					
Worker Vehicles	990.04	0.23	0.21	0.00	1,059.28
Visitor Cars and Delivery Trucks	160.67	0.03	0.03	0.00	169.58
Subtotal of Off-Site Emissions	**1,150.71**	**0.26**	**0.23**	0.00	**1,228.86**
Total Maximum Emissions	**2,447.50**	**0.48**	**0.31**	**0.02**	**2,847.10**

Calico Solar

Emissions from Emergency Diesel Generator

Rated Horsepower	**335**	**BHP**
Testing duration	**20**	**min/month**
Yearly testing	**12**	**month/year**
Expected non-emergency usage	**4**	**hr/yr**

Pollutant	Emision Factor	Emission Rate	Emission Rate per Testing	Yearly Emissions	Hourly Emission Rate	Annual Emission Rate
	g/HP/Hr	lb/hr	lb	lb/yr	g/s	g/s
NO_X	4.61	3.41	1.14	13.63	0.143	1.96E-04
CO	0.39	0.29	0.10	1.15	0.012	1.66E-05
VOC (Total Hydrocarbons)	0.15	0.11	0.04	0.44	0.005	6.38E-06
SO_X	0.12	0.09	0.03	0.35	0.004	5.10E-06
PM_{10}	0.06	0.04	0.01	0.18	0.002	2.55E-06
$PM_{2.5}$	0.06	0.04	0.01	0.18	0.002	2.55E-06
CO_2		447.54	149.18	1790.15	18.797	2.57E-02
CH_4		0.02	0.01	0.07	0.001	1.01E-06
N_2O		0.004	0.0015	0.02	0.0002	2.54E-07
CO_2e		449.28	149.76	1797.10	18.870	2.58E-02

Engine parameters

Flow Rate (acfm)	1218	17.726	m/s
Exhaust Temp (degrees C)	465	738.15	K
Stack Diameter (feet)	0.6667	0.2032	m
Stack height (feet) above ground	6.5	1.981	m
Fuel Use (gal/hr)[2]	20	20.000	gal/hr

Note:

1. The stack will be in outdoor enclosures, not in buildings.
2. Fuel use value is based on the engine parameter data in CARB Table 1 of "Risk Management Guidance for the Permitting of New Stationary Diesel-Fueled Engines", Oct 2000.
3. Emission rates for the criteria pollutant are based on vendor data (to meet Tier 3 requirements).
4. Greenhouse gas emission factors from CCAR General Reporting Protocol V3.1 January 2009 Tables C.7 and C.9
5. Greenhouse Gas Global Warming Potential (GWP) - Intergovernmental Panel on Climate Change, Second Assessment Report (1996)

   - CO_2 GWP (SAR, 1996) = 1
   - CH_4 GWP (SAR, 1996) = 21
   - N_2O GWP (SAR, 1996) = 310

6. PM2.5 emissions are assumed to be the same as the PM10 emissions

Calico Solar

Equipment =	5000-gal above ground storage tank
Fuel =	Gasoline
Dimension=	88" W x 299" L x 67" H
Throughput (gal/year) =	100,000
Days of Operations (days/year) =	365

	TOG Emission Factor[2]	TOG Emissions[1]	
Description	**(lbs/1000 gal)**	**(tons/Year)**	**(lbs/day)**
Working Loss[3]		0.409	2.242
Breathing Loss[3]		0.536	2.935
Vehicle Refueling - Vapor Displacement	0.74	0.037	0.203
Vehicle Refueling - Spillage	0.42	0.021	0.115
Total Vehicle Refueling		0.058	0.318
Total TOG Emissions		**1.003**	**5.495**

Note:

1. Emission estimate based on 120,000 gallon per year tank throughput.
2. Emission factors from CARB Emission Inventory Estimation Guidelines Section 4.10 GASOLINE DISPENSING FACILITIES (Revised May 1999)
3. Emission estimates from EPA Tank4.0.9d model results

Calico Solar

Estimated maximum potential sulfur hexafluoride (SF_6) emissions leakage emissions from proposed circuit breakers and other transmissions system equipment

Breaker	Qty	Typical Make	Typical Model	SF6 Lbs/Bkr	Leakage Rate	Leakage Lbs/Yr (per Bkr)	Leakage Lbs/Yr (All Bkrs)	CO_2e emissions (metric tons/Yr)
34.5kV Solar Group Breaker (3000A)	6	GE-Hitachi HVB	HS Series	31	1%	0.31	1.86	20.16
242kV Power Circuit Breaker (2000A)	8	GE-Hitachi HVB	HP Series	240	1%	2.4	19.2	208.14
242kV Coupling Capacitor Voltage Transformer (900A)	6	GE-Hitachi HVB	HP Series	240	1%	2.4	14.4	156.11
							CO_2e emissions (metric tons/Yr)	384.42

Note:

Greenhouse Gas Global Warming Potentials (GWPs) - Intergovernmental Panel on Climate Change, Second Assessment Report (1996)

Greenhouse Gas	GWP (SAR, 1996)
SF_6	23,900

OPERATIONS AND MAINTENANCE VEHICLES REQUIREMENTS

Description	Activity	Make / Model	Fuel	Quantity	Frequency	Horse-power	Vehicle Weight (tons)	Assumed idle time on site during washing & maintaining the suncatchers per vehicle (idle hr/day)	Max Daily Onsite Distance per Vehicle (mile/day)	Assumed distance percentage to drive on paved main access road	Assumed distance percentage to drive on onsite unimproved PV access paths	Assumed distance percentage to drive on onsite sealed roads	Max Daily Offsite Round-trip Distance per Vehicle within MDAQMD jurisdictional area (mile/day)	Travel to and from	Max Daily Total Distance per Vehicle (mile/day)	Max. Operating Hours / Day	Max. Operating Days / Month
Suncatcher Washing Vehicle	Mirror Washing	12 ton Truck	Gasoline	6	Daily	225	12	4.0	6.8	10%	0%	90%	0	on-site only	6.8	8	30
LRU Maintenance Truck with Boom	Field Servicing & Maintenance	10 ton Truck	Gasoline	6	Daily	200	10	4.0	6.8	10%	0%	90%	0	on-site only	6.8	8	30
PV Module Washing Truck	Washing PV Panels and Spraying Water on the unpaved road	Pickup truck	Gasoline	24	Daily, 5 days a week	250	4	4.0	48	10%	50%	40%	0	on-site only	48	10	22
Water Trucks	All onsite water will be provided by onsite well	3700 gal truck	Gasoline	4	Daily	300	11.7		16.2	50%	0%	50%	0	on-site only	16.2	12	30
Security/General Site Work Truck	Site Inspections & Security	Toyota Highlander or similar	Gasoline - Hybrid	7	Daily	187	2.25		53	10%	0%	90%	0	on-site only	53	24	30
Skid-Steer Loader	Minor grading and utility use	Bobcat or equivalent	Gasoline	1	Daily, 5 days a week	90	4		48	10%	60%	30%	0	on-site only	48	12	22
Four Wheel ATV	Utility use	Fuel Injected CARB Certified	Gasoline	10	Daily, 5 days a week	40	0.3		48	10%	60%	30%	0	on-site only	48	10	22
Rubber-wheeled forklift with telescoping boom	SunCatcher PCU & Mirror Maintenance	Telehandler	Propane	1	Daily	50	4		6.8	10%	0%	90%	0	on-site only	6.8	8	30
Forklift	Warehousing of supplies (indoor only)		Propane	1	Daily	50	3		10	100%	0%	0%	0	on-site only	10	8	30
Telescoping Man Lift	Facility Maintenance and SunCatcher PCU & Mirror Maintenance		Propane	2	Daily	50	3		6.8	10%	0%	90%	0	on-site only	6.8	8	30
Staff Cars	Community to Work	Passenger vehicles	Gasoline & diesel	120	Daily	100	2		4.4	95%	0%	5%	74	Barstow	78.4	2	30
Van Pooling		Passenger Truck/Van	Gasoline	5	Daily	150	4		4.4	100%	0%	0%	74	Barstow	78.4	2	30
Visitor Cars	Sales, Deliveries, Services	Passenger vehicles	Gasoline & diesel	10	Daily, 5 days a week	100	2		4.4	95%	0%	5%	156	LA	160.4	8	22
Delivery Trucks	Operations and Maintenance Supplies	5 ton Cargo	Diesel	1	Weekly	200	5		4.4	100%	0%	0%	99	Barstow/ LA	103.4	2	5
	Waste Management	20 ton	Diesel	1	Weekly	250	20		4.4	100%	0%	0%	130	Class III sites	134.4	2	5
	Hazardous Waste	20 ton	Diesel	1	Weekly	250	20		4.4	100%	0%	0%	156	Class I sites	160.4	2	5
Transport Tractor Trailers	Spare Parts, Building Supplies, Temporary Rental Equipment	40-foot	Diesel	1	Weekly	250	20		4.4	95%	0%	5%	99	Barstow/ LA	103.4	2	5

Note:

1. **Bold** are offroad equipment
2. All other vehicles and equipment will use on-road engines
3. Average distance from main service complex to center of suncatcher portion (north site) is 3.4 miles. Thus, the average round trip distance for suncatcher washing vehicle and LRU truck travels is 6.8 miles.
4. Average distance from the Project site entrance to the Main Service Complex is about 2.2 miles.
5. The fenceline perimeter is approximately 30 miles. Each security vehicle is assumed to travel from the MSC to the site entrance (2.2 miles), and around the perimeter plus one trip to the center of north fenced property (3.4 miles) and the center of southwest fenced property (4.7 miles) and back (and plus additional 10% for misc trips) = approximately 53 miles.
6. 70% of the time the Project will get the supplies from Barstow, CA area and 30% of the time the Project will get the supplies from elsewhere (notably the Los Angeles Basin).
7. The distance from the Project site to Barstow is approximately 37 miles.
8. The distance from the Project site to the edge of the MDAQMD jurisdictional area toward LA is about 78 miles.
9. Two CLASS I waste sites are: (1) Clean Harbors Buttonwillow Landfill (Solid Waste Facility) Lokern Road Kern County, CA - 214 miles to Solar One site; (2) Chemical Waste Management Kettleman Hills Landfill (Solids Waste Facility) 36251 Old Skyline Road Kettleman City, CA 93239 - 240 miles to Solar One site. Information is from the AFC Table 5.14-1.
10. The distance from the Project site to the edge of the MDAQMD jurisdictional area toward the Class I waste sites is about 78 miles.
11. Average distance to the Class III waste site is about 65 miles (within the MDAQMD jurisdictional area). It is assumed half of the general solid waste will go to the disposal site in Barstow and the other half will go to the other Class III waste sites listed in the AFC Table 5.14-1.
12. There are three kinds of roads. The first is the main plant access road, which is an asphalt paved road. The second type is a dirt road, sealed with Solitac or equivalent. Most of the roads on site are of this type. The roads between suncatcher rows are of this type. The third type is not a road at all, but rather an unimproved access path between the rows of PV panels. These paths remain entirely unimproved. These paths are only 70 feet long, and dead-end at the main tracker drive shaft. Hence vehicle traffic in these paths must travel very slowly (5 mph), and vehicles must back out. Speeds will be very low. The largest vehicle to enter these paths will be a standard sized pickup truck, equipped with a water tank, hose reel and spray wand. The truck operator will park at one or two places along the access lane, get out, and manually spray multiple PV panels with the spray wand. However, for most inspections and minor maintenance tasks, smaller ATV type vehicles will be used instead of pickup trucks. These ATVs are more maneuverable, and cause less soil disturbance.
13. Estimated the daily maximum driving distance is 48 miles for PV Module Washing Trucks, Skid-Steer Loaders, and Four Wheel ATVs.
14. Each rubber-wheeled forklift with telescoping boom and telescoping Man Lift is assumed one trip to the center of suncatcher portion in the north fenced property (3.4 miles) and back. So the daily maximum driving distance is estimated to be 6.8 miles.
15. The forklift will only to be used indoor and in the MSC area. Estimated the max. driiving distance per day is 10 miles.
16. Each water truck is assumed one trip to the center of north fenced property (3.4 miles) and the center of southwest fenced property (4.7 miles) and back. So the daily maximum driving distance is estimated to be 16.2 miles.

Calico Solar - Operation and Maintenance Equipment Emissions (on-site)

Emission Factors For Combustion Exhaust Emissions

Equipment Description	Horse-power	Vehicle Weight (lbs)	Fuel	Emission Factors (unit: g/mile or g/idle-hr for on-road vehicle, lb/hr for off-road equipment, g/bhp-hr for locomotive)									
				PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_x	CO_2	CH_4	N_2O	Total GHG - CO_2e
On-road Vehicle				Emission factors (g/mile or g/idle-hr)									
Suncatcher Washing Vehicle (running)	225	24,000	Gasoline	0.032	0.015	0.497	0.041	0.117	0.016	1672.267	0.104	0.081	1699.64
Suncatcher Washing Vehicle (idling)	225	24,000	Gasoline	0.000	0.000	155.230	27.137	1.790	0.049	4776.900	0.296	0.232	4855.10
LRU Maintenance Truck with Boom (running)	200	20,000	Gasoline	0.032	0.015	0.497	0.041	0.117	0.016	1672.267	0.104	0.081	1699.64
LRU Maintenance Truck with Boom (idling)	200	20,000	Gasoline	0.000	0.000	155.230	27.137	1.790	0.049	4776.900	0.296	0.232	4855.10
PV Module Washing Truck (running)	250	8,000	Gasoline	0.032	0.015	0.497	0.041	0.117	0.016	1672.267	0.104	0.081	1699.64
PV Module Washing Truck (idling)	250	8000	Gasoline	0.000	0.000	155.230	27.137	1.790	0.049	4776.900	0.296	0.232	4855.10
Water Trucks	300	23,400	Gasoline	0.032	0.015	0.497	0.041	0.117	0.016	1672.267	0.005	0.005	1673.86
Security/General Site Work Truck	187	4,500	Gasoline - Hybrid	0.010	0.010	2.100	0.055	0.030	0.009	326.296	0.104	0.081	353.67
Staff Cars	100	4,000	Gasoline & diesel	0.072	0.055	3.121	0.192	0.286	0.007	712.582	0.070	0.065	734.12
Van Pooling	150	8,000	Gasoline	0.039	0.024	0.933	0.030	0.065	0.012	1223.764	0.016	0.010	1227.22
Visitor Cars	100	4,000	Gasoline & diesel	0.072	0.055	3.121	0.192	0.286	0.007	712.582	0.070	0.065	734.12
Operations and Maintenance Supplies truck	200	10,000	Diesel	0.089	0.067	1.857	0.261	3.793	0.005	519.299	0.005	0.005	520.89
Waste Management truck	250	40,000	Diesel	0.923	0.811	8.172	3.888	17.517	0.030	3165.446	0.005	0.005	3167.04
Hazardous Waste truck	250	40,000	Diesel	0.923	0.811	8.172	3.888	17.517	0.030	3165.446	0.005	0.005	3167.04
Transport Tractor Trailers truck	250	40,000	Diesel	0.923	0.811	8.172	3.888	17.517	0.030	3165.446	0.005	0.005	3167.04
Off-road Equipment				Emission factors (lb/hr)									
Skid-Steer Loader	90	8,000	Gasoline	0.006	0.006	1.918	0.046	0.123	0.001	79.227	0.003	0.008	81.62
Four Wheel ATV	40	600	Gasoline	0.001	0.001	0.119	0.076	0.000	0.000	0.253	0.005	0.000	0.38
Rubber-wheeled forklift with telescoping boom	50	8,000	Propane	0.002	0.002	0.295	0.002	0.086	0.000	18.295	0.017	0.001	19.07
Forklift	50	6,000	Propane	0.002	0.002	0.295	0.002	0.086	0.000	18.295	0.017	0.001	19.07
Telescoping Man Lift	50	6,000	Propane	0.002	0.002	0.295	0.002	0.086	0.000	18.295	0.017	0.001	19.07

Note:

1. Vehicle description in EMFAC2007 model
   - Suncatcher Washing Vehicle is Medium-Heavy-Duty (MHD-CAT)
   - LRU Maintenance Truck with Boom is Medium-Heavy-Duty (MHD-CAT).
   - PV Module Washing Truck with Boom is Medium-Heavy-Duty (MHD-CAT) (conservative).
   - Water Truck is Medium-Heavy-Duty (MHD-CAT)
   - Security/General Site Work Truck (gasoline) is Light-Duty (LDT2-CAT)
   - Staff Car is Passenger Cars (LDA-ALL)
   - Van Pooling is Medium-Duty Trucks (MDV-CAT)
   - Visitor Cars is Passenger Cars (LDA-ALL)
   - Operations and Maintenance Supplies Delivery Truck is Light-Heavy-Duty (LHD1-DSL)
   - Waste Management Delivery Truck is Heavy-Heavy-Duty (HHD-DSL)
   - Hazardous Waste Delivery Truck is Heavy-Heavy-Duty (HHD-DSL)
   - Transport Tractor Trailer is Heavy-Heavy-Duty (HHD-DSL)
2. Criteria pollutant emission factors for propane fuel off-road equipment obtained from CARB OFFROAD2007.
3. Rubber-wheeled forklift with telescoping boom and telescoping man lift are all forklifts
4. PM emission factors determined using guidance from SCAQMD Final - Methodology to Calculate PM_{10} and $PM_{2.5}$ Significance Thresholds 10/1/2006, Appendix A - Updated CEIDARS Table with $PM_{2.5}$ Fractions

   On-road vehicles
   - $PM_{2.5}$ Fraction of PM_{10}, Brake wear: 0.429
   - $PM_{2.5}$ Fraction of PM_{10}, Diesel: 0.920
   - $PM_{2.5}$ Fraction of PM_{10}, Gasoline-catalyst: 0.928
   - $PM_{2.5}$ Fraction of PM_{10}, Tire wear: 0.250
   - Assume $PM_{2.5}$ and PM_{10} Fraction of total PM for gasoline hybrid car is: 1.000

   Off-road equipment
   - Assume $PM_{2.5}$ and PM_{10} Fraction of total PM for propane fuel equipment is: 1.000
5. The emissions of "Toyota Highlander Hybrid" meet the Tier 2/Bin 3 Federal emissions standard (reference source 3) and its performance is 27 mile/gallon in city (from Toyota website)
6. SO_2 emission factors for the Toyota Highlander Hybrid are from EMFAC2007- Light-Duty Trucks (LDT2-CAT).
7. N_2O emission factors for propane fuel off-road equipment are from Reference Source 2: Table C.6, California Climate Action Registry General Reporting Protocol Version 3.1, January 2009
8. CO_2 emission factors for gasoline and diesel fuel on-road vehicles are from EMFAC2007 model.
9. CH_4 and N_2O emission factors for the running vehicles are from Reference source 1: Table C.4, California Climate Action Registry General Reporting Protocol Version 3.1, January 2009. Hybrid Truck is assumed to be gasoline light truck here.
10. CH_4 and N_2O emission factors for the idling vehicles are scaled from the same type of running vehicle emission factor.
11. Greenhouse Gas Global Warming Potential (GWP) - Intergovernmental Panel on Climate Change, Second Assessment Report (1996)
    - CO_2 GWP (SAR, 1996) = 1
    - CH_4 GWP (SAR, 1996) = 21
    - N_2O GWP (SAR, 1996) = 310

Daily Emissions For Combustion Exhaust Emissions

Equipment Description	No. Of Units	Max Daily Distance per Vehicle (mile/day)	Max Daily VMT (all units)	Max. Daily Emissions (lb/day)									
				PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_x	CO_2	CH_4	N_2O	Total GHG - CO_2e
On-road Vehicle													
Suncatcher Washing Vehicle (running)	6	6.8	41	0.003	0.001	0.045	0.004	0.011	0.001	150.283	0.009	0.007	152.743
Suncatcher Washing Vehicle (idling)	6	-	-	-	-	8.206	1.435	0.095	0.003	252.523	0.016	0.012	256.657
LRU Maintenance Truck with Boom (running)	6	6.8	41	0.003	0.001	0.045	0.004	0.011	0.001	150.283	0.009	0.007	152.743
LRU Maintenance Truck with Boom (idling)	6	-	-	-	-	8.206	1.435	0.095	0.003	252.523	0.016	0.012	256.657
PV Module Washing Truck (running)	24	48.0	1,152	0.081	0.038	1.261	0.104	0.297	0.041	4,243.285	0.263	0.206	4,312.752
PV Module Washing Truck (idling)	24	-	-	-	-	32.824	5.738	0.379	0.010	1,010.093	0.063	0.049	256.657
Water Trucks	4	53.0	212	0.015	0.007	0.232	0.019	0.055	0.007	780.882	0.002	0.002	781.627
Security/General Site Work Truck	7	48.0	336	0.007	0.007	1.554	0.041	0.022	0.007	241.488	0.077	0.060	261.749
Staff Cars	120	4.4	528	0.084	0.064	3.630	0.223	0.333	0.008	828.730	0.082	0.075	853.775
Van Pooling	5	4.4	22	0.002	0.001	0.045	0.001	0.003	0.001	59.301	0.001	0.000	59.469
Visitor Cars	10	4.4	44	0.007	0.005	0.302	0.019	0.028	0.001	69.061	0.007	0.006	71.148
Operations and Maintenance Supplies truck	1	4.4	4	0.001	0.001	0.018	0.003	0.037	0.000	5.033	0.000	0.000	5.048
Waste Management truck	1	4.4	4	0.009	0.008	0.079	0.038	0.170	0.000	30.678	0.000	0.000	30.694
Hazardous Waste truck	1	4.4	4	0.009	0.008	0.079	0.038	0.170	0.000	30.678	0.000	0.000	30.694
Transport Tractor Trailers truck	1	4.4	4	0.009	0.008	0.079	0.038	0.170	0.000	30.678	0.000	0.000	30.694
Off-road Equipment													
Skid-Steer Loader	1			0.074	0.074	23.019	0.550	1.481	0.009	950.724	0.032	0.090	979.431
Four Wheel ATV	10			0.093	0.093	11.927	7.632	0.002	0.045	25.331	0.474	0.009	37.946
Rubber-wheeled forklift with telescoping boom	1			0.013	0.013	2.358	0.016	0.690	-	146.357	0.134	0.011	152.537
Forklift	1			0.013	0.013	2.358	0.016	0.690	-	146.357	0.134	0.011	152.537
Telescoping Man Lift	2			0.026	0.026	4.715	0.032	1.381	-	292.714	0.268	0.022	305.075
Max. Daily Emissions Total (lb/day)				**0.45**	**0.37**	**100.98**	**17.38**	**6.12**	**0.14**	**9,697.01**	**1.59**	**0.58**	**9,140.64**

Hourly Emissions For Combustion Exhaust Emissions

Equipment Description	Max. Operating Hours / Day	Max. Hourly Emissions (lb/hr)									
		PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_x	CO_2	CH_4	N_2O	Total GHG - CO_2e
On-road Vehicle											
Suncatcher Washing Vehicle (running)	8	0.000	0.000	0.006	0.000	0.001	0.000	18.785	0.001	0.001	19.093
Suncatcher Washing Vehicle (idling)	8	-	-	1.026	0.179	0.012	0.000	31.565	0.002	0.002	32.082
LRU Maintenance Truck with Boom (running)	8	0.000	0.000	0.006	0.000	0.001	0.000	18.785	0.001	0.001	19.093
LRU Maintenance Truck with Boom (idling)	8	-	-	1.026	0.179	0.012	0.000	31.565	0.002	0.002	32.082
PV Module Washing Truck (running)	10	0.008	0.004	0.126	0.010	0.030	0.004	424.329	0.026	0.021	431.275
PV Module Washing Truck (idling)	10	-	-	3.282	0.574	0.038	0.001	101.009	0.006	0.005	25.666
Water Trucks	12	0.001	0.001	0.019	0.002	0.005	0.001	65.074	0.000	0.000	65.136
Security/General Site Work Truck	24	0.000	0.000	0.065	0.002	0.001	0.000	10.062	0.003	0.003	10.906
Staff Cars	2	0.042	0.032	1.815	0.112	0.166	0.004	414.365	0.041	0.038	426.888
Van Pooling	2	0.001	0.001	0.023	0.001	0.002	0.000	29.651	0.000	0.000	29.735
Visitor Cars	8	0.001	0.001	0.038	0.002	0.003	0.000	8.633	0.001	0.001	8.893
Operations and Maintenance Supplies truck	2	0.000	0.000	0.009	0.001	0.018	0.000	2.516	0.000	0.000	2.524
Waste Management truck	2	0.004	0.004	0.040	0.019	0.085	0.000	15.339	0.000	0.000	15.347
Hazardous Waste truck	2	0.004	0.004	0.040	0.019	0.085	0.000	15.339	0.000	0.000	15.347
Transport Tractor Trailers truck	2	0.004	0.004	0.040	0.019	0.085	0.000	15.339	0.000	0.000	15.347
Off-road Equipment											
Skid-Steer Loader	12	0.006	0.006	1.918	0.046	0.123	0.001	79.227	0.003	0.008	81.619
Four Wheel ATV	10	0.009	0.009	1.193	0.763	0.000	0.005	2.533	0.047	0.001	3.795
Rubber-wheeled forklift with telescoping boom	8	0.002	0.002	0.295	0.002	0.086	-	18.295	0.017	0.001	19.067
Forklift	8	0.002	0.002	0.295	0.002	0.086	-	18.295	0.017	0.001	19.067
Telescoping Man Lift	8	0.003	0.003	0.589	0.004	0.173	-	36.589	0.034	0.003	38.134
Max. Hourly Emissions Total (lb/hr)		**0.09**	**0.07**	**11.85**	**1.94**	**1.01**	**0.02**	**1,357.30**	**0.20**	**0.09**	**1,311.10**

Yearly Emissions For Combustion Exhaust Emissions

Equipment Description	Max. Operating Days / Month	Max. Annual Emissions (ton/year)									
		PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_x	CO_2	CH_4	N_2O	Total GHG - CO_2e
On-road Vehicle											
Suncatcher Washing Vehicle (running)	30	0.001	0.000	0.008	0.001	0.002	0.000	27.051	0.002	0.001	27.494
Suncatcher Washing Vehicle (idling)	30	-	-	1.477	0.258	0.017	0.000	45.454	0.003	0.002	46.198
LRU Maintenance Truck with Boom (running)	30	0.001	0.000	0.008	0.001	0.002	0.000	27.051	0.002	0.001	27.494
LRU Maintenance Truck with Boom (idling)	30	-	-	1.477	0.258	0.017	0.000	45.454	0.003	0.002	46.198
PV Module Washing Truck (running)	22	0.011	0.005	0.166	0.014	0.039	0.005	560.114	0.035	0.027	569.283
PV Module Washing Truck (idling)	22	-	-	4.333	0.757	0.050	0.001	133.332	0.008	0.006	33.879
Water Trucks	30	0.003	0.001	0.042	0.003	0.010	0.001	140.559	0.000	0.000	140.693
Security/General Site Work Truck	30	0.001	0.001	0.280	0.007	0.004	0.001	43.468	0.014	0.011	47.115
Staff Cars	30	0.015	0.011	0.653	0.040	0.060	0.001	149.171	0.015	0.014	153.680
Van Pooling	30	0.000	0.000	0.008	0.000	0.001	0.000	10.674	0.000	0.000	10.704
Visitor Cars	22	0.001	0.001	0.040	0.002	0.004	0.000	9.116	0.001	0.001	9.392
Operations and Maintenance Supplies truck	5	0.000	0.000	0.001	0.000	0.001	0.000	0.151	0.000	0.000	0.151
Waste Management truck	5	0.000	0.000	0.002	0.001	0.005	0.000	0.920	0.000	0.000	0.921
Hazardous Waste truck	5	0.000	0.000	0.002	0.001	0.005	0.000	0.920	0.000	0.000	0.921
Transport Tractor Trailers truck	5	0.000	0.000	0.002	0.001	0.005	0.000	0.920	0.000	0.000	0.921
Off-road Equipment											
Skid-Steer Loader	22	0.010	0.010	3.038	0.073	0.196	0.001	125.496	0.004	0.012	129.285
Four Wheel ATV	22	0.012	0.012	1.574	1.007	0.000	0.006	3.344	0.063	0.001	5.009
Rubber-wheeled forklift with telescoping boom	30	0.002	0.002	0.424	0.003	0.124	-	26.344	0.024	0.002	27.457
Forklift	30	0.002	0.002	0.424	0.003	0.124	-	26.344	0.024	0.002	27.457
Telescoping Man Lift	30	0.005	0.005	0.849	0.006	0.248	-	52.689	0.048	0.004	54.913
Max. Annual Emissions Total (ton/year)		**0.06**	**0.05**	**14.81**	**2.44**	**0.91**	**0.02**	**1,428.57**	**0.25**	**0.09**	**1,359.16**

Calico Solar
Fugitive Dust Emissions (on-site)

Travel on paved road

$E = [k * (sL/2)^{0.91} * (W)^{1.02}] (1 - P/4N)$

Source: EPA AP-42 Section 13.2.1 Paved Roads Equation 2 (Jan. 2011 version)
E = particulate emission factor (lb/VMT),
k = particle size multiplier for particle size range and units of interest (lb/VMT),
sL = road surface silt loading (grams per square meter) (g/m^2), use more representative numbers from CARB - Emission Inventory Database - Section 7.8 SJV - Entrained Paved Road Dust - Rural Roads (emission inventory
1.6 code: 640-643-5400-0000), June 2006.
W = average weight (tons) of the vehicles traveling the road, and

constants

	$PM_{2.5}$	PM_{10}	
k	0.00054	0.0022	lb/VMT

23 P = Mean number of days per year with at least 0.01 inches of precipitation (from Daggett FAA Airport Station)
365 N = number of days in the year (averaging period)

Vehicle Type	No. Of Unit	Max Daily Distance per Vehicle (mile/day)	Assumed distance percentage to drive on paved road	Max Daily Distance per Vehicle to drive on paved road (mile/day)	Max Daily VMT (all units)	Mean Vehicle Weight (tons)	Max. Operating Hours / Day	Max. Operating Days / Month	$PM_{2.5}$ EF (lbs/VMT)	PM_{10} EF (lbs/VMT)
Suncatcher Washing Vehicle	6	6.8	10%	0.68	4	12	8	30	0.005	0.022
LRU Maintenance Truck with Boom	6	6.8	10%	0.68	4	10	8	30	0.005	0.019
PV Module Washing Truck	24	48	10%	4.8	115	4	10	22	0.002	0.007
Water Trucks	4	16.2	50%	8.1	32	11.7	12	30	0.005	0.022
Security/General Site Work Truck	7	53	10%	5.3	37	2.25	24	30	0.001	0.004
Skid-Steer Loader	1	48	10%	4.8	5	4	12	22	0.002	0.007
Four Wheel ATV	10	48	10%	4.8	48	0.3	10	22	0.000	0.001
Rubber-wheeled forklift with telescoping boom	1	6.8	10%	0.68	1	4	8	30	0.002	0.007
Forklift	1	10	100%	10	10	3	8	30	0.001	0.005
Telescoping Man Lift	2	6.8	10%	0.68	1	3	8	30	0.001	0.005
Staff Cars	120	4.4	95%	4.18	502	2	2	30	0.001	0.004
Van Pooling	5	4.4	100%	4.4	22	4	2	30	0.002	0.007
Visitor Cars	10	4.4	95%	4.18	42	2	8	22	0.001	0.004
Operations and Maintenance Supplies truck	1	4.4	100%	4.4	4	5	2	5	0.002	0.009
Waste Management truck	1	4.4	100%	4.4	4	20	2	5	0.009	0.038
Hazardous Waste truck	1	4.4	100%	4.4	4	20	2	5	0.009	0.038
Transport Tractor Trailers truck	1	4.4	95%	4.18	4	20	2	5	0.009	0.038

Vehicle Type	Watering Control Efficiency		PM_{10} Emissions (lb/hr)		PM_{10} Emissions (lb/day)		% of daily emissions	PM_{10} Emissions (tons/year)		$PM_{2.5}$ Emissions (lb/hr)		$PM_{2.5}$ Emissions (lb/day)		$PM_{2.5}$ Emissions (tons/year)	
	Unmitigated	Mitigated	Unmitigated	Mitigated	Unmitigated	Mitigated		Unmitigated	Mitigated	Unmitigated	Mitigated	Unmitigated	Mitigated	Unmitigated	Mitigated
Suncatcher Washing Vehicle	0%	0%	0.01	0.01	0.09	0.09	1.97%	0.02	0.02	0.00	0.00	0.02	0.02	0.00	0.00
LRU Maintenance Truck with Boom	0%	0%	0.01	0.01	0.08	0.08	1.63%	0.01	0.01	0.00	0.00	0.02	0.02	0.00	0.00
PV Module Washing Truck	0%	0%	0.08	0.08	0.84	0.84	18.13%	0.11	0.11	0.02	0.02	0.21	0.21	0.03	0.03
Water Trucks	0%	0%	0.06	0.06	0.70	0.70	15.24%	0.13	0.13	0.01	0.01	0.17	0.17	0.03	0.03
Security/General Site Work Truck	0%	0%	0.01	0.01	0.15	0.15	3.25%	0.03	0.03	0.00	0.00	0.04	0.04	0.01	0.01
Skid-Steer Loader	0%	0%	0.00	0.00	0.03	0.03	0.76%	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00
Four Wheel ATV	0%	0%	0.00	0.00	0.02	0.02	0.54%	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00
Rubber-wheeled forklift with telescoping boom	0%	0%	0.00	0.00	0.00	0.00	0.11%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Forklift	0%	0%	0.01	0.01	0.05	0.05	1.17%	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00
Telescoping Man Lift	0%	0%	0.00	0.00	0.01	0.01	0.16%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Staff Cars	0%	0%	0.90	0.90	1.80	1.80	38.93%	0.32	0.32	0.22	0.22	0.44	0.44	0.08	0.08
Van Pooling	0%	0%	0.08	0.08	0.16	0.16	3.46%	0.03	0.03	0.02	0.02	0.04	0.04	0.01	0.01
Visitor Cars	0%	0%	0.02	0.02	0.15	0.15	3.24%	0.02	0.02	0.00	0.00	0.04	0.04	0.00	0.00
Operations and Maintenance Supplies truck	0%	0%	0.02	0.02	0.04	0.04	0.87%	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00
Waste Management truck	0%	0%	0.08	0.08	0.17	0.17	3.58%	0.00	0.00	0.02	0.02	0.04	0.04	0.00	0.00
Hazardous Waste truck	0%	0%	0.08	0.08	0.17	0.17	3.58%	0.00	0.00	0.02	0.02	0.04	0.04	0.00	0.00
Transport Tractor Trailers truck	0%	0%	0.08	0.08	0.16	0.16	3.40%	0.00	0.00	0.02	0.02	0.04	0.04	0.00	0.00
TOTAL Fugitive emissions for vehicles traveled on paved road			**1.44**	**1.44**	**4.62**	**4.62**		**0.70**	**0.70**	**0.35**	**0.35**	**1.13**	**1.13**	**0.17**	**0.17**

Travel on unpaved surfaces

$E = k * (s/12)^a * (W/3)^b * [(365 - P)/365]$

EPA AP-42 Section 13.2.2 Unpaved Roads Equations 1a and 2
E = size-specific emission factor (lb/VMT)
k, a, b = empirical constants
8.5 s = surface material silt content (%)
W = mean vehicle weight (tons)

Construction sites - Scraper routes

constants

	$PM_{2.5}$	PM_{10}	Industrial Roads
k	0.15	1.5	
a	0.9	0.9	
b	0.45	0.45	

23 P = Mean number of days per year with at least 0.01 inches of precipitation (from Daggett FAA Airport Station)

Vehicle Type	No. Of Unit	Max Daily Distance per Vehicle (mile/day)	Assumed distance percentage to drive on unpaved roads	Max Daily Distance per Vehicle to drive on unpaved roads (mile/day)	Max Daily VMT (all vehicles)	Mean Vehicle Weight (tons)	Max. Operating Hours / Day	Max. Operating Days / Month	$PM_{2.5}$ EF (lbs/VMT)	PM_{10} EF (lbs/VMT)
Suncatcher Washing Vehicle	6	6.8	0%	0	0	12	8	30	0.192	1.923
LRU Maintenance Truck with Boom	6	6.8	0%	0	0	10	8	30	0.177	1.771
PV Module Washing Truck	24	48	50%	24	576	4	10	22	0.117	1.173
Water Trucks	4	16.2	0%	0	0	12	12	30	0.190	1.901
Security/General Site Work Truck	7	53	0%	0	0	2	24	30	0.091	0.905
Skid-Steer Loader	1	48	60%	28.8	29	4	12	22	0.117	1.173
Four Wheel ATV	10	48	60%	28.8	288	0	10	22	0.037	0.366
Rubber-wheeled forklift with telescoping boom	1	6.8	0%	0	0	4	8	30	0.117	1.173
Forklift	1	10	0%	0	0	3	8	30	0.103	1.030
Telescoping Man Lift	2	6.8	0%	0	0	3	8	30	0.103	1.030
Staff Cars	120	4.4	0%	0	0	2	2	30	0.086	0.859
Van Pooling	5	4.4	0%	0	0	4	2	30	0.117	1.173
Visitor Cars	10	4.4	0%	0	0	2	8	22	0.086	0.859
Operations and Maintenance Supplies truck	1	4.4	0%	0	0	5	2	5	0.130	1.297
Waste Management truck	1	4.4	0%	0	0	20	2	5	0.242	2.420
Hazardous Waste truck	1	4.4	0%	0	0	20	2	5	0.242	2.420
Transport Tractor Trailers truck	1	4.4	0%	0	0	20	2	5	0.242	2.420

Vehicle Type	Watering Control Efficiency		PM_{10} Emissions (lb/hr)		PM_{10} Emissions (lb/day)		% of daily emissions	PM_{10} Emissions (tons/year)		$PM_{2.5}$ Emissions (lb/hr)		$PM_{2.5}$ Emissions (lb/day)		$PM_{2.5}$ Emissions (tons/year)	
	Unmitigated	Mitigated	Unmitigated	Mitigated	Unmitigated	Mitigated		Unmitigated	Mitigated	Unmitigated	Mitigated	Unmitigated	Mitigated	Unmitigated	Mitigated
Suncatcher Washing Vehicle	0%	74.8%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
LRU Maintenance Truck with Boom	0%	74.8%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PV Module Washing Truck	0%	74.8%	67.56	17.02	675.59	170.25	82.93%	89.18	22.47	6.76	1.70	67.56	17.02	8.92	2.25
Water Trucks	0%	74.8%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Security/General Site Work Truck	0%	74.8%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Skid-Steer Loader	0%	74.8%	2.81	0.71	33.78	8.51	4.15%	4.46	1.12	0.28	0.07	3.38	0.85	0.45	0.11
Four Wheel ATV	0%	74.8%	10.53	2.65	105.30	26.54	12.93%	13.90	3.50	1.05	0.27	10.53	2.65	1.39	0.35
Rubber-wheeled forklift with telescoping boom	0%	74.8%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Forklift	0%	74.8%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Telescoping Man Lift	0%	74.8%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Staff Cars	0%	74.8%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Van Pooling	0%	74.8%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Visitor Cars	0%	74.8%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Operations and Maintenance Supplies truck	0%	74.8%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Waste Management truck	0%	74.8%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hazardous Waste truck	0%	74.8%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Transport Tractor Trailers truck	0%	74.8%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL Fugitive emissions for vehicles traveled on unpaved road			**80.90**	**20.39**	**814.67**	**205.30**		**107.54**	**27.10**	**8.09**	**2.04**	**81.47**	**20.53**	**10.75**	**2.71**

Note:

1. It is assumed the project will water twice a day and limit the onsite vehicle speed to less than 25 mph to mitigate the fugitive dust.
(http://www.aqmd.gov/CEQA/handbook/mitigation/fugitive/MM_fugitive.html) - 55% from watering twice per day, 44% from limiting speeds to 25 mph, and 74.8% [=1-(1-0.55)*(1-0.44)] from doing these two

Travel on sealed roads (paved)

$E = [k * (sL/2)^{0.91} * (W)^{1.02}] (1 - P/4N)$

Source: EPA AP-42 Section 13.2.1 Paved Roads Equation 2 (Jan. 2011 version)
E = particulate emission factor (lb/VMT),
k = particle size multiplier for particle size range and units of interest (lb/VMT),
7.4 sL = road surface silt loading (grams per square meter) (g/m^2), from AP-42 Table 13.2.1-3 for Municipal solid waste landfill
W = average weight (tons) of the vehicles traveling the road, and

constants

	$PM_{2.5}$	PM_{10}	
k	0.00054	0.0022	lb/VMT

23 P = Mean number of days per year with at least 0.01 inches of precipitation (from Daggett FAA Airport Station)
365 N = number of days in the year (averaging period)

Vehicle Type	No. Of Unit	Max Daily Distance per Vehicle (mile/day)	Assumed distance percentage to drive on sealed roads	Max Daily Distance per Vehicle to drive on sealed roads (mile/day)	Max Daily VMT (all units)	Mean Vehicle Weight (tons)	Max. Operating Hours / Day	Max. Operating Days / Month	$PM_{2.5}$ EF (lbs/VMT)	PM_{10} EF (lbs/VMT)
Suncatcher Washing Vehicle	6	6.8	90%	6	37	12	8	30	0.022	0.090
LRU Maintenance Truck with Boom	6	6.8	90%	6	37	10	8	30	0.018	0.075
PV Module Washing Truck	24	48	40%	19	461	4	10	22	0.007	0.029
Water Trucks	4	16.2	50%	8	32	11.7	12	30	0.021	0.088
Security/General Site Work Truck	7	53	90%	48	334	2.25	24	30	0.004	0.016
Skid-Steer Loader	1	48	30%	14	14	4	12	22	0.007	0.029
Four Wheel ATV	10	48	30%	14	144	0.3	10	22	0.001	0.002
Rubber-wheeled forklift with telescoping boom	1	6.8	90%	6	6	4	8	30	0.007	0.029
Forklift	1	10	0%	0	0	3	8	30	0.005	0.022
Telescoping Man Lift	2	6.8	90%	6	12	3	8	30	0.005	0.022
Staff Cars	120	4.4	5%	0	26	2	2	30	0.004	0.014
Van Pooling	5	4.4	0%	0	0	4	2	30	0.007	0.029
Visitor Cars	10	4.4	5%	0	2	2	8	22	0.004	0.014
Operations and Maintenance Supplies truck	1	4.4	0%	0	0	5	2	5	0.009	0.037
Waste Management truck	1	4.4	0%	0	0	20	2	5	0.037	0.151
Hazardous Waste truck	1	4.4	0%	0	0	20	2	5	0.037	0.151
Transport Tractor Trailers truck	1	4.4	5%	0	0	20	2	5	0.037	0.151

Vehicle Type	Watering Control Efficiency		PM_{10} Emissions (lb/hr)		PM_{10} Emissions (lb/day)		% of daily emissions	PM_{10} Emissions (tons/year)		$PM_{2.5}$ Emissions (lb/hr)		$PM_{2.5}$ Emissions (lb/day)		$PM_{2.5}$ Emissions (tons/year)	
	Unmitigated	Mitigated	Unmitigated	Mitigated	Unmitigated	Mitigated		Unmitigated	Mitigated	Unmitigated	Mitigated	Unmitigated	Mitigated	Unmitigated	Mitigated
Suncatcher Washing Vehicle	0%	0%	0.41	0.41	3.30	3.30	11.21%	0.59	0.59	0.10	0.10	0.81	0.81	0.15	0.15
LRU Maintenance Truck with Boom	0%	0%	0.34	0.34	2.74	2.74	9.31%	0.49	0.49	0.08	0.08	0.67	0.67	0.12	0.12
PV Module Washing Truck	0%	0%	1.35	1.35	13.50	13.50	45.87%	1.78	1.78	0.33	0.33	3.31	3.31	0.44	0.44
Water Trucks	0%	0%	0.24	0.24	2.84	2.84	9.64%	0.51	0.51	0.06	0.06	0.70	0.70	0.13	0.13
Security/General Site Work Truck	0%	0%	0.23	0.23	5.44	5.44	18.48%	0.98	0.98	0.06	0.06	1.33	1.33	0.24	0.24
Skid-Steer Loader	0%	0%	0.04	0.04	0.42	0.42	1.43%	0.06	0.06	0.01	0.01	0.10	0.10	0.01	0.01
Four Wheel ATV	0%	0%	0.03	0.03	0.30	0.30	1.02%	0.04	0.04	0.01	0.01	0.07	0.07	0.01	0.01
Rubber-wheeled forklift with telescoping boom	0%	0%	0.02	0.02	0.18	0.18	0.61%	0.03	0.03	0.01	0.01	0.04	0.04	0.01	0.01
Forklift	0%	0%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Telescoping Man Lift	0%	0%	0.03	0.03	0.27	0.27	0.91%	0.05	0.05	0.01	0.01	0.07	0.07	0.01	0.01
Staff Cars	0%	0%	0.19	0.19	0.38	0.38	1.30%	0.07	0.07	0.05	0.05	0.09	0.09	0.02	0.02
Van Pooling	0%	0%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Visitor Cars	0%	0%	0.00	0.00	0.03	0.03	0.11%	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00
Operations and Maintenance Supplies truck	0%	0%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Waste Management truck	0%	0%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hazardous Waste truck	0%	0%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Transport Tractor Trailers truck	0%	0%	0.02	0.02	0.03	0.03	0.11%	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00
TOTAL Fugitive emissions for vehicles traveled on sealed road (paved)			**2.90**	**2.90**	**29.42**	**29.42**		**4.61**	**4.61**	**0.71**	**0.71**	**7.22**	**7.22**	**1.13**	**1.13**

on-site fugitive

Vehicle Type	No. Of Unit	Max Daily Distance per Vehicle (mile/day)	Max. Operating Hours / Day	Assumed distance percentage to drive on paved main access road	Assumed distance percentage to drive on onsite unimproved PV access paths	Assumed distance percentage to drive on onsite sealed roads	Paved Road - PM_{10} Fugitive Emissions (lb/day)	Unpaved Road - PM_{10} Fugitive Emissions (lb/day)	Sealed Road - PM_{10} Fugitive Emissions (lb/day)	Total PM_{10} Fugitive Emissions (lb/day)
Suncatcher Washing Vehicle	6	6.8	8	10%	0%	90%	0.09	0.00	3.30	3.39
LRU Maintenance Truck with Boom	6	6.8	8	10%	0%	90%	0.08	0.00	2.74	2.81
PV Module Washing Truck	24	48	10	10%	50%	40%	0.84	170.25	13.50	184.58
Water Trucks	4	16.2	12	50%	0%	50%	0.70	0.00	2.84	3.54
Security/General Site Work Truck	7	53	24	10%	0%	90%	0.15	0.00	5.44	5.59
Skid-Steer Loader	1	48	12	10%	60%	30%	0.03	8.51	0.42	8.97
Four Wheel ATV	10	48	10	10%	60%	30%	0.02	26.54	0.30	26.86
Rubber-wheeled forklift with telescoping boom	1	6.8	8	10%	0%	90%	0.00	0.00	0.18	0.18
Forklift	1	10	8	100%	0%	0%	0.05	0.00	0.00	0.05
Telescoping Man Lift	2	6.8	8	10%	0%	90%	0.01	0.00	0.27	0.27
Staff Cars	120	4.4	2	95%	0%	5%	1.80	0.00	0.38	2.18
Van Pooling	5	4.4	2	100%	0%	0%	0.16	0.00	0.00	0.16
Visitor Cars	10	4.4	8	95%	0%	5%	0.15	0.00	0.03	0.18
Operations and Maintenance Supplies truck	1	4.4	2	100%	0%	0%	0.04	0.00	0.00	0.04
Waste Management truck	1	4.4	2	100%	0%	0%	0.17	0.00	0.00	0.17
Hazardous Waste truck	1	4.4	2	100%	0%	0%	0.17	0.00	0.00	0.17
Transport Tractor Trailers truck	1	4.4	2	95%	0%	5%	0.16	0.00	0.03	0.19
							4.62	**205.30**	**29.42**	**239.34**

Calico Solar - Operation and Maintenance Equipment Emissions (off-site)

Emission Factors For Combustion Exhaust Emissions

				Emission Factors (unit: g/mile or g/idle-hr for on-road vehicle, lb/hr for off-road equipment, g/bhp-hr for locomotive)									
Equipment Description	**Horse-power**	**Vehicle Weight (lbs)**	**Fuel**	**PM_{10}**	**$PM_{2.5}$**	**CO**	**ROG**	**NO_x**	**SO_x**	**CO_2**	**CH_4**	**N_2O**	**Total GHG - CO_2e**
On-road Vehicle				**Emission factors (g/mile or g/idle-hr)**									
Suncatcher Washing Vehicle (running)													
Suncatcher Washing Vehicle (idling)													
LRU Maintenance Truck with Boom (running)													
LRU Maintenance Truck with Boom (idling)							driving on-site only						
PV Module Washing Truck (running)													
PV Module Washing Truck (idling)													
Water Trucks													
Security/General Site Work Truck													
Staff Cars	100	4,000	Gasoline & diesel	0.032	0.018	1.607	0.043	0.186	0.003	289.288	0.070	0.065	310.82
Van Pooling	150	8,000	Gasoline	0.025	0.011	0.492	0.006	0.040	0.005	496.468	0.016	0.010	499.93
Visitor Cars	100	4,000	Gasoline & diesel	0.032	0.018	1.607	0.043	0.186	0.003	289.288	0.070	0.065	310.82
Operations and Maintenance Supplies truck	200	10,000	Diesel	0.046	0.028	0.488	0.083	3.056	0.005	519.299	0.005	0.005	520.89
Waste Management truck	250	40,000	Diesel	0.377	0.309	2.210	0.445	8.854	0.016	1670.679	0.005	0.005	1672.27
Hazardous Waste truck	250	40,000	Diesel	0.377	0.309	2.210	0.445	8.854	0.016	1670.679	0.005	0.005	1672.27
Transport Tractor Trailers	250	40,000	Diesel	0.377	0.309	2.210	0.445	8.854	0.016	1670.679	0.005	0.005	1672.27
Off-road Equipment				**Emission factors (lb/hr)**									
Skid-Steer Loader													
Four Wheel ATV													
Rubber-wheeled forklift with telescoping boom							driving on-site only						
Forklift													
Telescoping Man Lift													

Note:

1. Vehicle description in EMFAC2007 model
   - Staff Car is Passenger Cars (LDA-ALL)
   - Van Pooling is Medium-Duty Trucks (MDV-CAT)
   - Visitor Cars is Passenger Cars (LDA-ALL)
   - Operations and Maintenance Supplies Delivery Truck is Light-Heavy-Duty (LHD1-DSL)
   - Waste Management Delivery Truck is Heavy-Heavy-Duty (HHD-DSL)
   - Hazardous Waste Delivery Truck is Heavy-Heavy-Duty (HHD-DSL)
   - Transport Tractor Trailer is Heavy-Heavy-Duty (HHD-DSL)
2. PM emission factors determined using guidance from SCAQMD Final - Methodology to Calculate PM_{10} and $PM_{2.5}$ Significance Thresholds 10/1/2006, Appendix A - Updated CEIDARS Table with $PM_{2.5}$ Fractions

   On-road vehicles
   - $PM_{2.5}$ Fraction of PM_{10}, Brake wear: 0.429
   - $PM_{2.5}$ Fraction of PM_{10}, Diesel: 0.920
   - $PM_{2.5}$ Fraction of PM_{10}, Gasoline-catalyst: 0.928
   - $PM_{2.5}$ Fraction of PM_{10}, Tire wear: 0.250
   - Assume $PM_{2.5}$ and PM_{10} Fraction of total PM for gasoline hybrid car is: 1.000
3. CO_2 emission factors for gasoline and diesel fuel on-road vehicles are from EMFAC2007 model.
4. CH_4 and N_2O emission factors for the running vehicles are from Reference source 1: Table C.4, California Climate Action Registry General Reporting Protocol Version 3.1, January 2009
5. Greenhouse Gas Global Warming Potential (GWP) - Intergovernmental Panel on Climate Change, Second Assessment Report (1996)
   - CO_2 GWP (SAR, 1996) = 1
   - CH_4 GWP (SAR, 1996) = 21
   - N_2O GWP (SAR, 1996) = 310

Daily Emissions For Combustion Exhaust Emissions

Equipment Description	No. Of Units	Max Daily Distance per Vehicle within MDAQMD jurisdictional area (mile/day)	Max Daily VMT (all units)	Max. Daily Emissions (lb/day) PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_x	CO_2	CH_4	N_2O	Total GHG - CO_2e
On-road Vehicle													
Suncatcher Washing Vehicle (running)													
Suncatcher Washing Vehicle (idling)													
LRU Maintenance Truck with Boom (running)													
LRU Maintenance Truck with Boom (idling)							driving on-site only						
PV Module Washing Truck (running)													
PV Module Washing Truck (idling)													
Water Trucks													
Security/General Site Work Truck													
Staff Cars	120	74.0	8,880	0.63	0.35	31.43	0.84	3.64	0.06	5,658.32	1.38	1.27	6,079.54
Van Pooling	5	74.0	370	0.02	0.01	0.40	0.00	0.03	0.00	404.61	0.01	0.01	407.43
Visitor Cars	10	156.0	1,560	0.11	0.06	5.52	0.15	0.64	0.01	994.03	0.24	0.22	1,068.03
Operations and Maintenance Supplies truck	1	99.0	99	0.01	0.01	0.11	0.02	0.67	0.00	113.24	0.00	0.00	113.59
Waste Management truck	1	130.0	130	0.11	0.09	0.63	0.13	2.54	0.00	478.39	0.00	0.00	478.85
Hazardous Waste truck	1	156.0	156	0.13	0.11	0.76	0.15	3.04	0.01	574.07	0.00	0.00	574.61
Transport Tractor Trailers	1	99.0	99	0.08	0.07	0.48	0.10	1.93	0.00	364.31	0.00	0.00	364.66
Off-road Equipment													
Skid-Steer Loader													
Four Wheel ATV													
Rubber-wheeled forklift with telescoping boom							driving on-site only						
Forklift													
Telescoping Man Lift													
			Max. Daily Emissions Total (lb/day)	**1.09**	**0.69**	**39.34**	**1.39**	**12.48**	**0.09**	**8,586.96**	**1.64**	**1.50**	**9,086.70**

Hourly Emissions For Combustion Exhaust Emissions

Equipment Description	Max. Operating Hours / Day	Max. Hourly Emissions (lb/hr) PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_x	CO_2	CH_4	N_2O	Total GHG - CO_2e
On-road Vehicle											
Suncatcher Washing Vehicle (running)											
Suncatcher Washing Vehicle (idling)											
LRU Maintenance Truck with Boom (running)											
LRU Maintenance Truck with Boom (idling)						driving on-site only					
PV Module Washing Truck (running)											
PV Module Washing Truck (idling)											
Water Trucks											
Security/General Site Work Truck											
Staff Cars	2	0.313	0.174	15.716	0.421	1.819	0.029	2,829.160	0.688	0.633	3,039.771
Van Pooling	2	0.010	0.005	0.200	0.002	0.016	0.002	202.305	0.006	0.004	203.715
Visitor Cars	8	0.014	0.008	0.690	0.018	0.080	0.001	124.254	0.030	0.028	133.503
Operations and Maintenance Supplies truck	2	0.005	0.003	0.053	0.009	0.333	0.001	56.620	0.001	0.001	56.794
Waste Management truck	2	0.054	0.044	0.316	0.064	1.268	0.002	239.194	0.001	0.001	239.423
Hazardous Waste truck	2	0.065	0.053	0.380	0.076	1.521	0.003	287.033	0.001	0.001	287.307
Transport Tractor Trailers	2	0.041	0.034	0.241	0.049	0.965	0.002	182.156	0.001	0.001	182.329
Off-road Equipment											
Skid-Steer Loader											
Four Wheel ATV											
Rubber-wheeled forklift with telescoping boom						driving on-site only					
Forklift											
Telescoping Man Lift											
	Max. Hourly Emissions Total (lb/hour)	**0.50**	**0.32**	**17.60**	**0.64**	**6.00**	**0.04**	**3,920.72**	**0.73**	**0.67**	**4,142.84**

Yearly Emissions For Combustion Exhaust Emissions

Equipment Description	Max. Operating Days / Month	Max. Annual Emissions (ton/year) PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_x	CO_2	CH_4	N_2O	Total GHG - CO_2e
On-road Vehicle											
Suncatcher Washing Vehicle (running)											
Suncatcher Washing Vehicle (idling)											
LRU Maintenance Truck with Boom (running)											
LRU Maintenance Truck with Boom (idling)						driving on-site only					
PV Module Washing Truck (running)											
PV Module Washing Truck (idling)											
Water Trucks											
Security/General Site Work Truck											
Staff Cars	30	0.11	0.06	5.66	0.15	0.65	0.01	1,018.50	0.25	0.23	1,094.32
Van Pooling	30	0.00	0.00	0.07	0.00	0.01	0.00	72.83	0.00	0.00	73.34
Visitor Cars	22	0.01	0.01	0.73	0.02	0.08	0.00	131.21	0.03	0.03	140.98
Operations and Maintenance Supplies truck	5	0.00	0.00	0.00	0.00	0.02	0.00	3.40	0.00	0.00	3.41
Waste Management truck	5	0.00	0.00	0.02	0.00	0.08	0.00	14.35	0.00	0.00	14.37
Hazardous Waste truck	5	0.00	0.00	0.02	0.00	0.09	0.00	17.22	0.00	0.00	17.24
Transport Tractor Trailers	5	0.00	0.00	0.01	0.00	0.06	0.00	10.93	0.00	0.00	10.94
Off-road Equipment											
Skid-Steer Loader											
Four Wheel ATV											
Rubber-wheeled forklift with telescoping boom						driving on-site only					
Forklift											
Telescoping Man Lift											
	Max. Annual Emissions Total (ton/year)	**0.14**	**0.08**	**6.52**	**0.18**	**0.99**	**0.01**	**1,268.44**	**0.28**	**0.26**	**1,354.59**

Calico Solar
Fugitive Dust Emissions (off-site)

Travel on paved road

$E = [k * (sL/2)^{0.91} * (W)^{1.02}] (1 - P/4N)$

Source: EPA AP-42 Section 13.2.1 Paved Roads Equation 2 (Jan. 2011 version)
E = particulate emission factor (lb/VMT),
k = particle size multiplier for particle size range and units of interest (lb/VMT),
0.32 sL = road surface silt loading (grams per square meter) (g/m^2), From CARB - Emission Inventory Database - Section 7.9 Entrained Paved Road Dust - Local Streets (emission inventory code: 640-641-5400-0000)
W = average weight (tons) of the vehicles traveling the road, and

constants

	$PM_{2.5}$	PM_{10}	
k	0.00054	0.0022	lb/VMT

23 P = Mean number of days per year with at least 0.01 inches of precipitation (from Daggett FAA Airport Station)
365 N = number of days in the year (averaging period)

Vehicle Type	No. Of Unit	Max Daily Distance per Vehicle (mile/day)	Assumed distance percentage to drive on paved road	Max Daily Distance per Vehicle to drive on paved road (mile/day)	Max Daily VMT (all units)	Mean Vehicle Weight (tons)	Max. Operating Hours / Day	Max. Operating Days / Month	$PM_{2.5}$ EF (lbs/VMT)	PM_{10} EF (lbs/VMT)
Suncatcher Washing Vehicle	driving on-site only									
LRU Maintenance Truck with Boom										
PV Module Washing Truck										
Water Trucks										
Security/General Site Work Truck										
Skid-Steer Loader										
Four Wheel ATV										
Rubber-wheeled forklift with telescoping boom										
Forklift										
Telescoping Man Lift										
Staff Cars	120	74.0	100%	74	8880	2	2	30	0.000	0.001
Van Pooling	5	74.0	100%	74	370	4	2	30	0.000	0.002
Visitor Cars	10	156.0	100%	156	1560	2	8	22	0.000	0.001
Operations and Maintenance Supplies truck	1	99.0	100%	99	99	5	2	5	0.001	0.002
Waste Management truck	1	130.0	100%	130	130	20	2	5	0.002	0.009
Hazardous Waste truck	1	156.0	100%	156	156	20	2	5	0.002	0.009
Transport Tractor Trailers truck	1	99.0	100%	99	99	20	2	5	0.002	0.009

Vehicle Type	Watering Control Efficiency		PM_{10} Emissions (lb/hr)		PM_{10} Emissions (lb/day)		% of daily emissions	PM_{10} Emissions (tons/year)		$PM_{2.5}$ Emissions (lb/hr)		$PM_{2.5}$ Emissions (lb/day)		$PM_{2.5}$ Emissions (tons/year)	
	Unmitigated	Mitigated	Unmitigated	Mitigated	Unmitigated	Mitigated		Unmitigated	Mitigated	Unmitigated	Mitigated	Unmitigated	Mitigated	Unmitigated	Mitigated
Suncatcher Washing Vehicle	driving on-site only														
LRU Maintenance Truck with Boom															
PV Module Washing Truck															
Water Trucks															
Security/General Site Work Truck															
Skid-Steer Loader															
Four Wheel ATV															
Rubber-wheeled forklift with telescoping boom															
Forklift															
Telescoping Man Lift															
Staff Cars	0%	0%	3.68	3.68	7.36	7.36	57.39%	1.32	1.32	0.90	0.90	1.81	1.81	0.33	0.33
Van Pooling	0%	0%	0.31	0.31	0.62	0.62	4.85%	0.11	0.11	0.08	0.08	0.15	0.15	0.03	0.03
Visitor Cars	0%	0%	0.16	0.16	1.29	1.29	10.08%	0.17	0.17	0.04	0.04	0.32	0.32	0.04	0.04
Operations and Maintenance Supplies truck	0%	0%	0.10	0.10	0.21	0.21	1.63%	0.01	0.01	0.03	0.03	0.05	0.05	0.00	0.00
Waste Management truck	0%	0%	0.56	0.56	1.13	1.13	8.80%	0.03	0.03	0.14	0.14	0.28	0.28	0.01	0.01
Hazardous Waste truck	0%	0%	0.68	0.68	1.35	1.35	10.56%	0.04	0.04	0.17	0.17	0.33	0.33	0.01	0.01
Transport Tractor Trailers truck	0%	0%	0.43	0.43	0.86	0.86	6.70%	0.03	0.03	0.11	0.11	0.21	0.21	0.01	0.01
TOTAL Fugitive emissions for vehicles traveled on paved road			**5.93**	**5.93**	**12.82**	**12.82**		**1.71**	**1.71**	**1.45**	**1.45**	**3.15**	**3.15**	**0.42**	**0.42**

off-site fugitive

Vehicle Type	No. Of Unit	Max Daily Distance per Vehicle (mile/day)	Max. Operating Hours / Day	Assumed distance percentage to drive on paved road	Assumed distance percentage to drive on unpaved road	Assumed distance percentage to drive on onsite sealed roads	Paved Road - PM_{10} Fugitive Emissions (lb/day)	Unpaved Road - PM_{10} Fugitive Emissions (lb/day)	Sealed Road - PM_{10} Fugitive Emissions (lb/day)	Total PM_{10} Fugitive Emissions (lb/day)
Suncatcher Washing Vehicle	driving on-site only									
LRU Maintenance Truck with Boom										
PV Module Washing Truck										
Water Trucks										
Security/General Site Work Truck										
Skid-Steer Loader										
Four Wheel ATV										
Rubber-wheeled forklift with telescoping boom										
Forklift										
Telescoping Man Lift										
Staff Cars	120	74	2	100%	0%	0%	7.36	0.00	0.00	7.36
Van Pooling	5	74	2	100%	0%	0%	0.62	0.00	0.00	0.62
Visitor Cars	10	156	8	100%	0%	0%	1.29	0.00	0.00	1.29
Operations and Maintenance Supplies truck	1	99	2	100%	0%	0%	0.21	0.00	0.00	0.21
Waste Management truck	1	130	2	100%	0%	0%	1.13	0.00	0.00	1.13
Hazardous Waste truck	1	156	2	100%	0%	0%	1.35	0.00	0.00	1.35
Transport Tractor Trailers truck	1	99	2	100%	0%	0%	0.86	0.00	0.00	0.86
							12.82	**0.00**	**0.00**	**12.82**

The Project Area soil conditions include slightly and moderately sloping topography and undeveloped site conditions. The use of erosion control best management practices (BMPs) to control water and wind erosion during construction activities, and placement of impervious surfaces and/or best management practices (BMPs) on disturbed areas within the Project Area will effectively control soil loss after construction. Quantitative calculations of potential soil loss using the Revised Universal Soil Loss Equation (Version 2, RUSLE 2) and Chepil Wind Erosion Equations utilizing the Wind Erosion Prediction System (WEPs) software have been performed, and the results are presented below. The Project's potential effects on soil resources can be categorized into those involving construction activities and those related to Project operation. Table 4.5-1 presents the anticipated disturbance areas north and south of the BNSF railway.

The average annual soil erosion rates by sheet and rill erosion caused by rainfall runoff for the soil associations with the Project are provided in the table below. Two soil textures were used for the calculations to correlate soil loss rates with soil texture. Based upon the calculations, the existing condition erosion rates increase during construction due primarily to fill placement without the use of erosion and sediment control BMPs. The Project will use construction and operation phase erosion and sediment control BMPs, and final stabilization to reduce soil erosion rates to at or below existing levels. The previously calculated soil erosion rates represented a conservative condition with an overland flow path length of 150 feet and an average slope steepness of 5%. Additional calculations were performed that include overland flow path lengths of 50 feet and 0.5-percent slope steepness and 100-feet overland flow length of 5-percent steepness for construction conditions. The BMPs reflected in the model include the use of linear sediment control barriers.

The WEPs model was used to estimate soil loss due to wind erosion. The existing wind erosion rates were estimated to be greater than 100 tons per acre per year for the soil associations. Wind erosion rates are an order of magnitude higher than soil erosion by rainfall runoff at this location due to the relatively low annual rainfall amount. Wind erosion control BMPs (e.g., tracking control, stabilized construction entrance exits, construction road stabilization, and dust control) will be used to maintain or reduce existing wind erosion rates during construction and operation. It is estimated that potential wind erosion rates will decrease based upon the proposed project modifications due to increased cover provided by the PV panels.

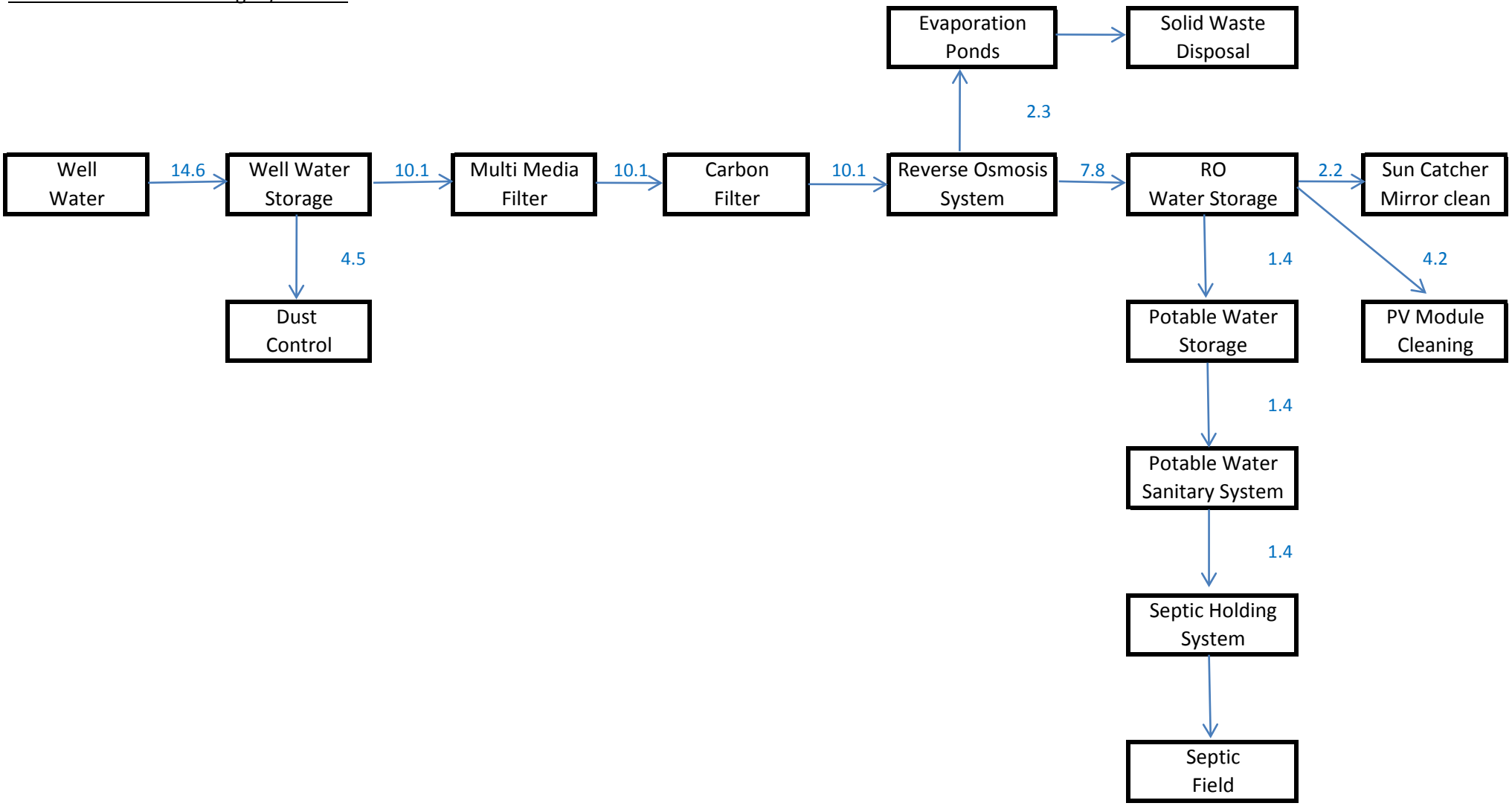
Table S-1
Original and Revised Estimated Soil Erosion Rates

Soil Type	Existing (ton/ac/yr)	Construction – Cut Area with No BMPs (ton/ac/yr)	Construction – Fill area with No BMPs (ton/ac/yr)	Construction – Average with No BMPs (ton/ac/yr)	Construction with BMPs (ton/ac/yr)	Operations with BMPs (ton/ac/yr)
Original Estimated:						
Carrizo Rositas Gunsight (60% Gravel, 30% Sand, 10% fines)	0.53	0.53	1.4	0.97	0.33	0.23
Nickel-Arizo-Bitter (30% Gravel, 30% Sand, 40% fines)	2.1	2.1	5.7	3.1	0.052	0.052
Revised Estimated:						
Carrizo Rositas Gunsight (60% Gravel, 30% Sand, 10% fines)	0.53	0.06-0.53	0.13-1.4	0.77	0.0018-0.33	0.0018-0.23
Nickel-Arizo-Bitter (30% Gravel, 30% Sand, 40% fines)	2.1	0.24-2.1	0.56-5.7	3.1	0.014-0.052	0.014-0.052

Notes:
< = less than
% = percent
BMP = Best Management Practice
ton/ac/yr = tons per acre per year
Soil erosion rates reflect sheet flow and rill erosion caused by storm water runoff and were calculated using the Revised Universal Soil Loss Equation (Version 2), RUSLE2 computer program.
BMP = Erosion and Sediment Control Best Management Practice (Erosion Blanket, Mulch, Silt Fence, Fiber Roll, or Final Stabilization, etc.).

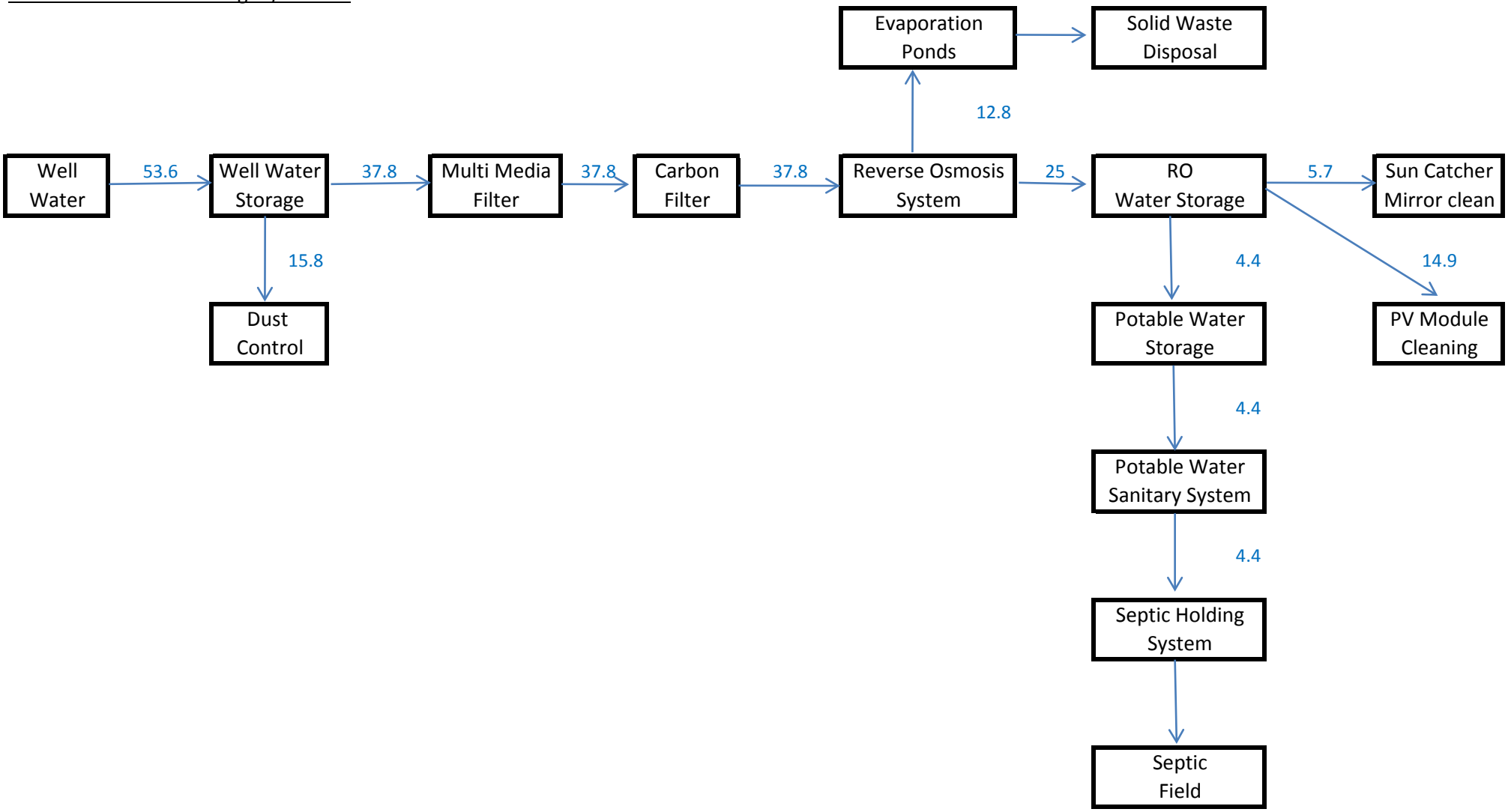
WATER BALANCE FLOW DIAGRAM
ANNUAL AVERAGE POST CONSTRUCTION

Note: All numbers are in gals/minute.



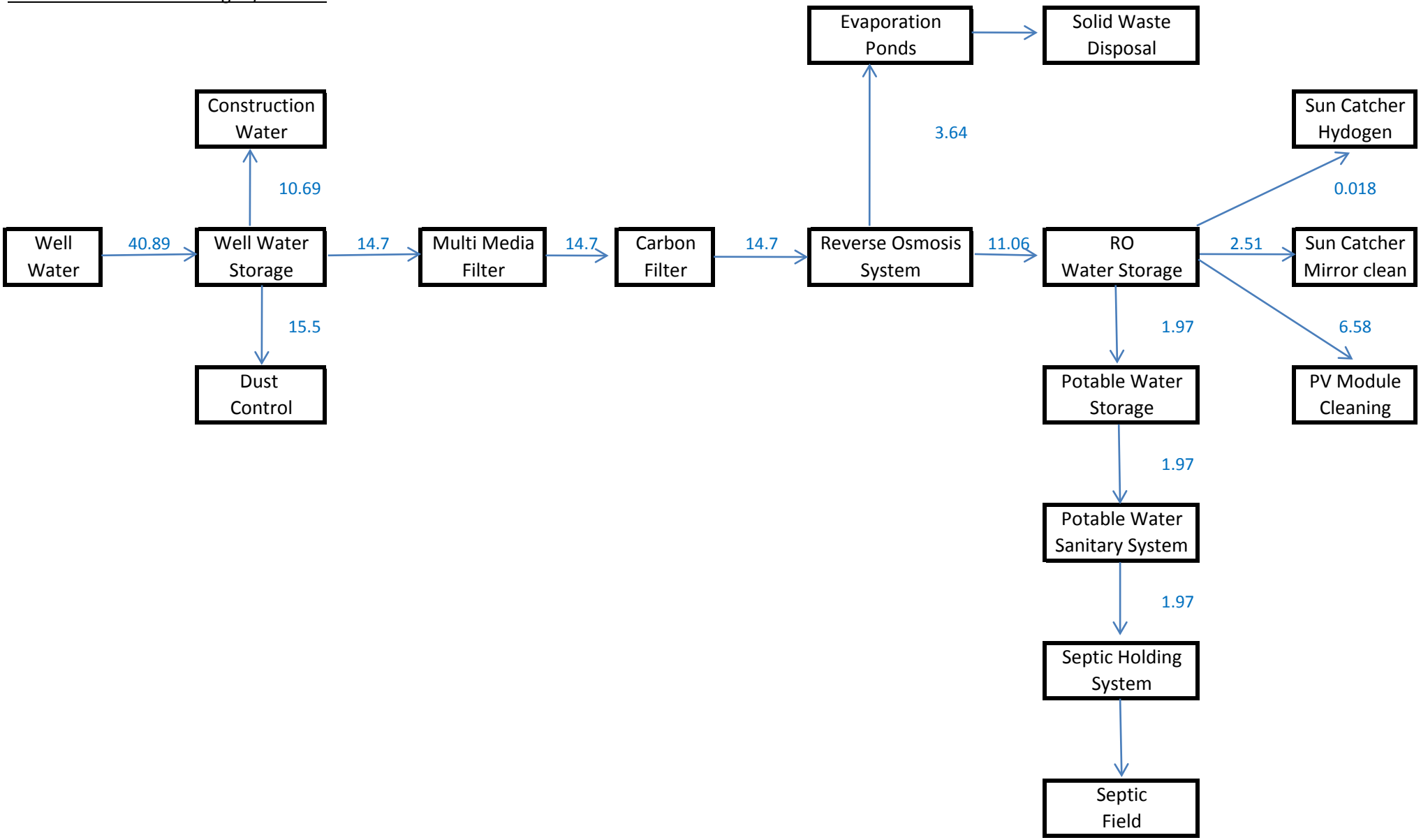
WATER BALANCE FLOW DIAGRAM
SUMMER PEAK POST CONSTRUCTION

Note: All numbers are in gals/minute.



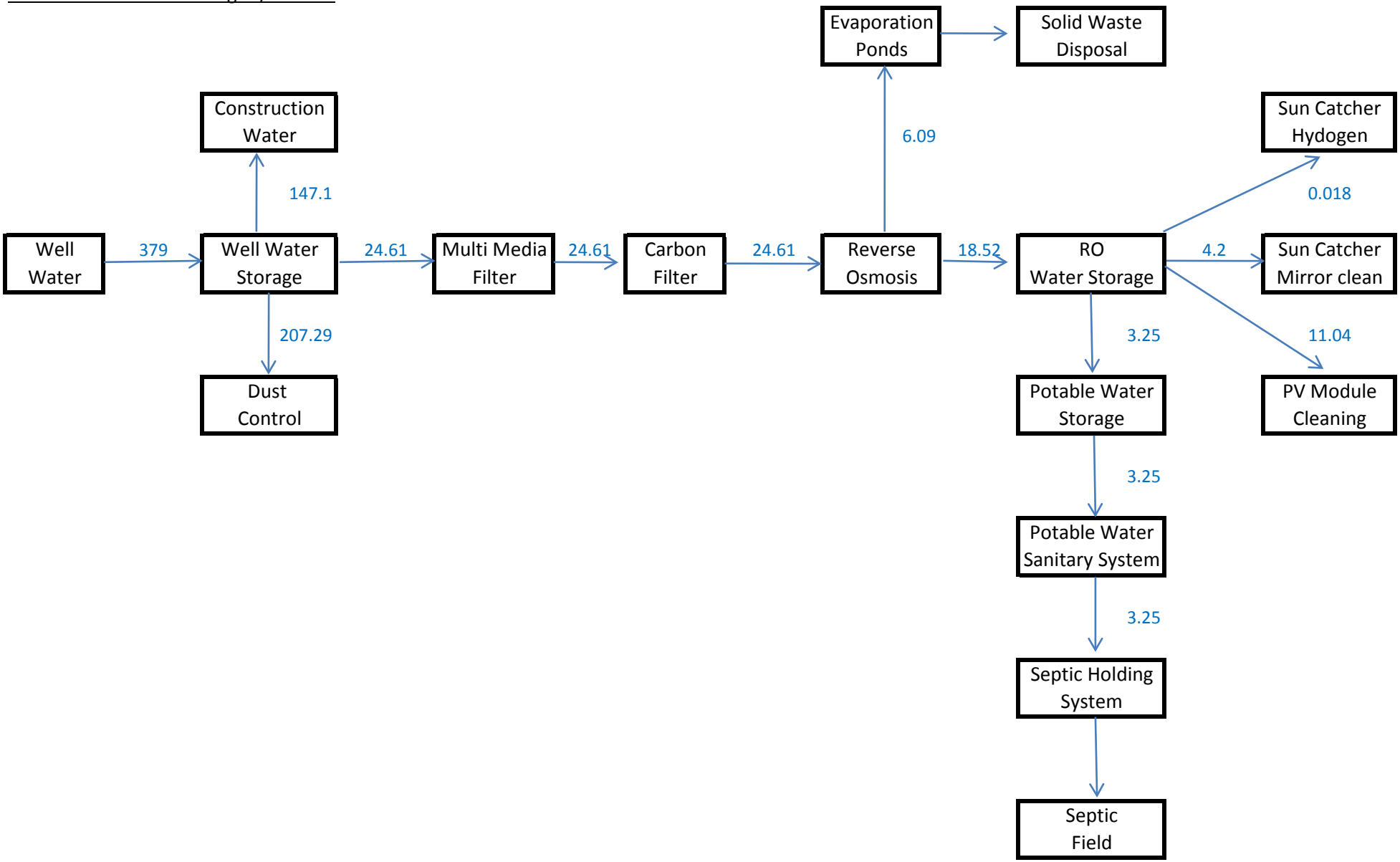
WATER BALANCE FLOW DIAGRAM
ANNUAL AVERAGE DURING CONSTRUCTION

Note: All numbers are in gals/minute.



WATER BALANCE FLOW DIAGRAM
SUMMER PEAK DURING CONSTRUCTION

Note: All numbers are in gals/minute.



This appendix has been provided under confidential cover.

Table F-1
PV Installation Noise Level at SR1

Construction Equipment	Horse Power	Quantity per Crew per Month	Predicted Noise Level (dBA)
Hydraulic Vibrating Post Driver	175	1	50
Flatbed Truck	250	2	55
Stickboom Crane	175	2	53
Trencher	50	1	45
Compactor	120	1	48
Large Backhoe With Mower Attachment	120	1	48
Skid-steer loader (Bobcat)	50	1	45
Backhoe	120	1	48
Front End Loader	250	2	55
Water Truck	450	1	54
Dump Truck	250	1	52
Aggregated Noise Level at SR1			62

Source: Calico Solar, LLC, 2011, URS Corporation 2011.

Notes:

- As a worst case scenario, all equipment is operated in full-power mode all the time.
- Distance between SR1 and the nearest PV Installation site is 4200 feet.
- Above equipment roster is per one (1) crew. It is assumed that up to five (5) crews would be in operation throughout the project area, with no more than 3 (three) actively adjacent to one another and the remaining two (2) active at other locations that are at least a mile distant from the aforementioned three that are adjacent.
- When three (3) such crews operate in close vicinity (i.e., geographically adjacent 20-acre areas), the noise level would increase to 67dBA per logarithmic summation: 62dBA + 10Log(3) = 67dBA.

Table F-2
PV Installation Noise Level at SR2

Construction Equipment	Horse Power	Quantity per Crew per Month	Predicted Noise Level (dBA)
Hydraulic Vibrating Post Driver	500	1	45
Flatbed Truck	250	2	49
Stickboom Crane	175	2	48
Trencher	50	1	39
Compactor	120	1	43
Large Backhoe With Mower Attachment	120	1	43
Skid-steer loader (Bobcat)	50	1	39
Backhoe	120	1	43
Front End Loader	250	2	49
Water Truck	450	1	49
Dump Truck	250	1	45
Aggregated Noise Level at SR2			56

Source: Calico Solar, LLC, 2011, URS Corporation 2011.

Notes:

- As a worst case scenario, all equipment is operated in full-power mode all the time.
- Distance between SR2 and the nearest PV Installation site is 7800 feet.
- Above equipment roster is per one (1) crew. It is assumed that up to five (5) crews would be in operation throughout the project area, with no more than 3 (three) actively adjacent to one another and the remaining two (2) active at other locations that are at least a mile distant from the aforementioned three that are adjacent.
- When three (3) such crews operate in close vicinity (i.e., geographically adjacent 20-acre areas), the noise level would increase to 61 dBA per logarithmic summation: 56 dBA + 10Log(3) = 66 dBA.

Table F-3
Overall Construction Equipment for Peak Day of each Month

Equipment Description	Utilization	HP	Base Sound (SPL at 1m, dBA)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
Air Compressor	40%	50	107	1	1	1	1	1	1	1	3	3	2	2	2	2	2	2	2	2	1	1						1	1	1	1	1												
Asphalt Paver	50%	120	111		1																								1															
Backhoe	40%	120	111	3																												2	2	1										
Compactor	20%	120	111	2																								1	1	1	1	3	2	1										
Crane small (Hydraulic Vibrating Post Driver and Stickboom Crane)	50%	175	112	5																												3	3	3	3	3	3	3	3	1	1	1	1	1
Crane large	16%	500	117	1	1	1	2	2	2	3	1													1	1	1	1	1	1	1	1													
Dozer	40%	250	114	1	1	1	1	1	1	1	1	1	1				1	1	1	1								1	1	1	1	1												
Generator	50%	50	107	1	1	1	1	1	2	3	2	5	5	5	5	5	3	3	3	3	3	2	2	2	2	2	1	1	1	1	1	1												
Grader	40%	175	112	2	2	1	1	1	1	1	1	1	1				1	2	1	1								1	1	1	1	1												
Light Tower	100%	50	107				1	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1																			
Loader	40%	250	114	2																												3	3	3	3	3	1							
Maxi Sneeker (Trencher)	50%	50	107	2																												2	2	1										
Skid Steer (Bobcat)	50%	50	107	2																												2	2	1										
Welding Machine	40%	50	107		1	2	3	5	5	5	5	5	5	5	5	3	3	3	3	2	1	1	1	0																				
Aerial Lift	50%	120	111	2	6	6	6	6	6	6	6	3	3	2	2	2	5	6	6	6	6	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	6	6	6	6	6	6	6
Fork Lift	50%	50	107	2	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	4	4	4										
Telehandler	20%	120	111			1	1	2	6	5	5	3	3	3	3	3	5	8	6	5	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Concrete Pump Truck for bridge	50%	250	114																									1	1	1	1	1	1	1										
Dump Truck	40%	250	114	3	2	2	1																					1	1	1		2	2	1										
Flatbed Truck	40%	250	114	2																									1	1		7	7	7	7	7	7	7	7	2	2	2	2	2
Staff & Security Truck	40%	187	112	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Pickup Truck	40%	175	112	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Water and Road Preparation Materials Truck	50%	250	114	5	12	8	8	7	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	3	3	4	4	3	3	1	1	1	1	1	1	1	1	1	1	1	1	1
Aggregate				53	51	47	49	51	54	55	54	51	50	47	47	45	50	55	52	50	43	38	37	37	37	34	33	40	42	40	38	56	51	46	36	36	34	37	37	30	30	30	30	30

Sources: Calico Solar, LLC, 2011. URS Corporation, 2011.

Notes:

- Construction Equipment, Horse Power and Equipment Quantities are provided by Calico Solar, LLC.
- Utilization rates are derived from Federal Highway Administration (FHWA) Roadway Construction Noise Model User's Guide.
- SPL (sound pressure level) at 1 meter is based on Beranek 1992, Section 18.5.
- Equipment quantity does not include equipment used for PV Installation and SunCatcher Installation.

Table F-4
Calculated Construction Noise Levels at SR1

Equipment Description	Distance to Receiver (ft)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
Air Compressor	15,500	29	29	29	29	29	29	29	34	34	32	32	32	32	32	32	32	32	29	29	0	0	0	0	0	29	29	29	29	29	0	0	0	0	0	0	0	0	0	0	0	0
Asphalt Paver	15,500	0	34	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	34	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Backhoe	15,500	38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	36	36	33	0	0	0	0	0	0	0	0	0	0
Compactor	15,500	33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	30	30	30	30	35	33	30	0	0	0	0	0	0	0	0	0	0
Crane small (Hydraulic Vibrating Post Driver and Stickboom Crane)	15,500	43	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40	40	40	40	40	40	40	40	36	36	36	36	36
Crane large	15,500	35	35	35	38	38	38	40	35	0	0	0	0	0	0	0	0	0	0	0	0	35	35	35	35	35	35	35	35	0	0	0	0	0	0	0	0	0	0	0	0	0
Dozer	15,500	36	36	36	36	36	36	36	36	36	36	0	0	0	36	36	36	36	0	0	0	0	0	0	0	36	36	36	36	36	0	0	0	0	0	0	0	0	0	0	0	0
Generator	15,500	30	30	30	30	30	33	35	33	37	37	37	37	37	35	35	35	35	35	33	33	33	33	33	30	30	30	30	30	30	0	0	0	0	0	0	0	0	0	0	0	0
Grader	15,500	38	38	35	35	35	35	35	35	35	35	0	0	0	35	38	35	35	0	0	0	0	0	0	0	35	35	35	35	35	0	0	0	0	0	0	0	0	0	0	0	0
Light Tower	15,500	0	0	0	33	36	36	36	36	36	36	36	36	36	36	36	36	36	33	33	33	33	33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Loader	15,500	39	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	41	41	41	41	41	36	0	0	0	0	0	0	0
Maxi Sneeker (Trencher)	15,500	33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	33	33	30	0	0	0	0	0	0	0	0	0	0
Skid Steer (Bobcat)	15,500	33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	33	33	30	0	0	0	0	0	0	0	0	0	0
Welding Machine	15,500	0	29	32	34	36	36	36	36	36	36	36	36	34	34	34	34	32	29	29	29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Aerial Lift	15,500	37	42	42	42	42	42	42	42	39	39	37	37	37	41	42	42	42	42	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	42	42	42	42	42	42	42
Fork Lift	15,500	33	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	36	36	36	0	0	0	0	0	0	0	0	0	0
Telehandler	15,500	0	0	30	30	33	38	37	37	35	35	35	35	35	37	39	38	37	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35
Concrete Pump Truck for bridge	15,500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	37	37	37	37	37	37	37	0	0	0	0	0	0	0	0	0	0
Dump Truck	15,500	41	39	39	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	36	36	36	0	39	39	36	0	0	0	0	0	0	0	0	0	0
Flatbed Truck	15,500	39	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	36	36	0	45	45	45	45	45	45	45	45	39	39	39	39	39
Staff & Security Truck	15,500	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43
Pickup Truck	15,500	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45
Water and Road Preparation Materials Truck	15,500	44	48	46	46	46	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	42	42	43	43	42	42	37	37	37	37	37	37	37	37	37	37	37	37	37
Aggregate Noise Level		52	52	51	51	51	51	51	51	51	51	50	50	50	51	51	51	51	50	50	50	50	50	49	49	50	51	50	50	52	52	51	51	51	50	51	51	49	49	49	49	49

Sources: Calico Solar, LLC, 2011. URS Corporation, 2011.

Table F-5
Calculated Construction Noise Levels at SR2

Equipment Description	Distance to Receiver (ft)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
Air Compressor	20,700	27	27	27	27	27	27	27	32	32	30	30	30	30	30	30	30	30	27	27	0	0	0	0	0	27	27	27	27	27	0	0	0	0	0	0	0	0	0	0	0	0
Asphalt Paver	20,700	0	32	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	32	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Backhoe	20,700	35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	34	34	31	0	0	0	0	0	0	0	0	0	0
Compactor	20,700	31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	28	28	28	28	32	31	28	0	0	0	0	0	0	0	0	0	0
Crane small (Hydraulic Vibrating Post Driver and Stickboom Crane)	20,700	40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	38	38	38	38	38	38	38	38	33	33	33	33	33
Crane large	20,700	33	33	33	36	36	36	38	33	0	0	0	0	0	0	0	0	0	0	0	0	33	33	33	33	33	33	33	33	0	0	0	0	0	0	0	0	0	0	0	0	0
Dozer	20,700	34	34	34	34	34	34	34	34	34	34	0	0	0	34	34	34	34	0	0	0	0	0	0	0	34	34	34	34	34	0	0	0	0	0	0	0	0	0	0	0	0
Generator	20,700	28	28	28	28	28	31	32	31	35	35	35	35	35	32	32	32	32	32	31	31	31	31	31	28	28	28	28	28	28	0	0	0	0	0	0	0	0	0	0	0	0
Grader	20,700	35	35	32	32	32	32	32	32	32	32	0	0	0	32	35	32	32	0	0	0	0	0	0	0	32	32	32	32	32	0	0	0	0	0	0	0	0	0	0	0	0
Light Tower	20,700	0	0	0	31	34	34	34	34	34	34	34	34	34	34	34	34	34	31	31	31	31	31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Loader	20,700	37	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	38	38	38	38	38	34	0	0	0	0	0	0	0
Maxi Sneeker (Trencher)	20,700	31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	31	31	28	0	0	0	0	0	0	0	0	0	0
Skid Steer (Bobcat)	20,700	31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	31	31	28	0	0	0	0	0	0	0	0	0	0
Welding Machine	20,700	0	27	30	32	34	34	34	34	34	34	34	34	32	32	32	32	30	27	27	27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Aerial Lift	20,700	35	39	39	39	39	39	39	39	36	36	35	35	35	38	39	39	39	39	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	39	39	39	39	39	39	39
Fork Lift	20,700	31	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	34	34	34	0	0	0	0	0	0	0	0	0	0
Telehandler	20,700	0	0	28	28	31	35	35	35	32	32	32	32	32	35	37	35	35	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
Concrete Pump Truck for bridge	20,700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	35	35	35	35	35	35	35	0	0	0	0	0	0	0	0	0	0
Dump Truck	20,700	38	37	37	34	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	34	34	34	0	37	37	34	0	0	0	0	0	0	0	0	0	0
Flatbed Truck	20,700	37	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	34	34	0	42	42	42	42	42	42	42	42	37	37	37	37	37
Staff & Security Truck	20,700	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
Pickup Truck	20,700	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43
Water and Road Preparation Materials Truck	20,700	42	45	44	44	43	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	39	39	41	41	39	39	35	35	35	35	35	35	35	35	35	35	35	35	35
Aggregate Noise Level		50	50	49	49	49	49	49	49	48	48	48	48	48	48	49	48	48	48	47	47	47	47	47	47	48	48	48	47	49	49	49	48	48	48	48	48	47	47	47	47	47

Sources: Calico Solar, LLC, 2011. URS Corporation, 2011.

LIST OF PROPERTY OWNERS

APN	OWNER	MAILING ADDRESS	MAILING CITY	MAILING ZIP	ACREAGE
0529-201-01	GOVERNMENT LAND	N/A	N/A	N/A	592.15
0529-201-02	UNITED STATES OF AMERICA	6221 BOX SPRINGS BLVD	RIVERSIDE, CA	92507-0714	627.61
0529-201-03	GOVERNMENT LAND	N/A	N/A	N/A	635.25
0529-201-05	GOVERNMENT LAND	N/A	N/A	N/A	557.23
0529-201-05	GOVERNMENT LAND	N/A	N/A	N/A	52.09
0529-201-06	GOVERNMENT LAND	N/A	N/A	N/A	5.34
0529-201-06	GOVERNMENT LAND	N/A	N/A	N/A	488.93
0529-201-08	ATCHISON TOPEKA AND SANTA FE RR CO	N/A	N/A	N/A	27.54
0529-201-08	ATCHISON TOPEKA AND SANTA FE RR CO	N/A	N/A	N/A	70.77
0529-201-09	ATCHISON TOPEKA AND SANTA FE RR CO	N/A	N/A	N/A	2.98
0529-201-09	ATCHISON TOPEKA AND SANTA FE RR CO	N/A	N/A	N/A	6.13
0529-201-10	ATCHISON TOPEKA AND SANTA FE RR CO	N/A	N/A	N/A	6.17
0529-201-10	ATCHISON TOPEKA AND SANTA FE RR CO	N/A	N/A	N/A	2.92
0529-201-11	ATCHISON TOPEKA AND SANTA FE RR CO	N/A	N/A	N/A	23.62
0529-201-12	UNITED STATES OF AMERICA	P O BOX 92007	LOS ANGELES, CA	90009	0.52
0529-201-13	RHEOX INC	P O BOX 700	HIGHTSTOWN, NJ	8520	99.95
0529-201-13	RHEOX INC	P O BOX 700	HIGHTSTOWN, NJ	08520	506.98
0529-211-03	PACIFIC GAS AND ELECTRIC CO	N/A	N/A	N/A	70.63
0529-211-11	PEROFF, SIMEON D	P O BOX 9063	CALABASAS, CA	91372	64.89
0529-211-17	GONZALEZ,EVA M 2010 TRUST	2193 TERREBONNE AVE	SAN DIMAS, CA	91773	9.10
0529-211-18	CORTEZ, JEREMY D 2009 TRUST	18843 HICREST DR	GLENDORA, CA	91471	1.85
0529-211-20	CORTEZ, JEREMY D 2009 TRUST	18843 HICREST RD	GLENDORA, CA	91741	6.03
0529-211-21	WAGNER, HF & CJ EXCLUSION TR	6698 LOS GATOS RD	ATASCADERO, CA	93422	7.84
0529-211-22	TONG, NHIEM & LY-HUONG P	PO BOX 2411	LA HABRA, CA	90632	4.48
0529-211-25	DAY, BUREN B AND WILMA K LEMERE	916 BAYLESS	AZUSA, CA	91702	1.65
0529-211-28	GOMEZ, EXEQUIEL	4287 SHETLAND LN	RIVERSIDE, CA	92509	41.64
0529-211-29	BASTEGHIAN, SARKIS	14949 SYLVAN ST	VAN NUYS, CA	91411	42.89
0529-211-30	L & J DUNCAN FAMILY LIMITED PARTNERS	4319 MARL WY	CARMICHAEL, CA	95608	29.44
0529-211-31	TORKAN, LIZA	9887 CARMELITA AVE	BEVERLY HILLS, CA	90210	70.94
0529-211-34	TONG, ALICE	3243 N MUSCATEL AVE	ROSEMEAD, CA	91770	36.97
0529-211-36	OROGO, JULIE	PO BOX 2570	CAMARILLO CA	93011	42.90
0529-211-44	MARSHALL, PAULETTE	P O BOX 4567	LONG BEACH, CA	90804	45.66
0529-211-45	KAZEMI, LOBAT	20524 VENTURA BLVD #110	WOODLAND HILLS, CA	91364	44.04
0529-211-47	SULPIZIO, RICHARD	2404 WILMA AVE	COMMERCE, CA	90040	4.30
0529-211-49	FERINGA, JOHN	930 7TH ST	NORCO, CA	92860	2.33

LIST OF PROPERTY OWNERS

APN	OWNER	MAILING ADDRESS	MAILING CITY	MAILING ZIP	ACREAGE
0529-211-51	FERINGA, JOHN	930 7TH ST	NORCO, CA	92860	47.73
0529-211-52	KUCHTA, TERRY W	PO BOX 188	PEARBLOSSOM, CA	93553	4.60
0529-211-53	FERINGA, JOHN	930 7TH ST	NORCO, CA	92860	4.89
0529-261-01	MI CASA PROPERTY LLC	1330 OAK VIEW AVE	SAN MARINO, CA	91108	29.29
0529-261-02	MENSA, D L & J M INTER VIVOS TR (2-1	181 HILLWAY CIRCLE	VENTURA, CA	93003	26.94
0529-261-04	COOK, PENELOPE L	1463 BIBIANA WY	UPLAND, CA	91786	22.37
0529-261-05	BEDNER, VIRGINIA L REV FAM TR 2/4/05	P O BOX 2993	WRIGHTWOOD, CA	92397	19.60
0529-261-06	EATWELL, FRANCIS R	519 KEYSER RONDO	CAMARILLO, CA	93010	17.17
0529-261-07	GENUINO, ANGELITO S TRUST DTD 06/26/	11746 BUFORD ST	CERRITOS, CA	90703	14.46
0529-261-08	AVANIAN, SARKIS	5432 LEMON GROVE AVE	LOS ANGELES, CA	90038	12.24
0529-261-10	NEGRIA, MIKE AND MIKE PRODAN	10524 RUTHELEN	LOS ANGELES, CA	90047	12.69
0529-261-11	CHILDERS, DARYL H LIV T RUST	6191 GREENBRIER DR	HUNTINGTON BEACH, CA	92648	12.16
0529-262-09	HARRINGTON, GEORGE P	8440 OTTO ST	DOWNEY, CA	90240	4.43
0529-262-12	YOUNG, JOE W TR	28352 CHAT DR	LAGUNA NIGUEL, CA	92677	41.15
0529-262-13	SLINGERLAND, KEITH D	P O BOX 355	CONCORD, CA	94522	38.20
0529-262-14	RIVERA, ANTHONY J SEP PRO TR 8-2-06	1038 E BASTANCHURY RD	FULLERTON, CA	92835	53.20
0529-262-15	SALRIN FAMILY TRUST DTD 11/18/03	940 BROCKTON LN	VENTURA, CA	93001	38.37
0529-262-16	KIM, BOK N	11951 SIERRA LN	NORTHRIDGE, CA	91326	215.65
0529-262-17	KIM, BOK N	11951 SIERRA LN	NORTHRIDGE, CA	91326	38.54
0529-271-01	GOVERNMENT LAND	N/A	N/A	N/A	330.81
0529-271-01	GOVERNMENT LAND	N/A	N/A	N/A	207.17
0529-271-02	GOVERNMENT LAND	N/A	N/A	N/A	292.87
0529-271-02	GOVERNMENT LAND	N/A	N/A	N/A	266.56
0529-281-01	GOVERNMENT LAND	N/A	N/A	N/A	632.52
0529-281-02	GOVERNMENT LAND	N/A	N/A	N/A	637.34
0529-281-04	GOVERNMENT LAND	N/A	N/A	N/A	304.39
0529-281-04	GOVERNMENT LAND	N/A	N/A	N/A	311.72
0529-281-05	GOVERNMENT LAND	N/A	N/A	N/A	415.84
0529-281-05	GOVERNMENT LAND	N/A	N/A	N/A	202.77
0529-281-06	GOVERNMENT LAND	N/A	N/A	N/A	153.31
0529-281-06	GOVERNMENT LAND	N/A	N/A	N/A	458.58
0529-281-07	ATCHISON TOPEKA AND SANTA FE RR CO	N/A	N/A	N/A	3.25
0529-281-08	FOX RIVER REHABILITATION CENTER	1220 N STATE PKWY	CHICAGO, IL	60610	39.92
0529-281-11	ONA, DOMINGO R	1578 COUNTRY VISTAS LANE	BONITA, CA	91902	80.24
0529-281-14	ALPERN, ALLEN W	5625 S MARINE DR	TEMPE, AZ	85283	19.97

LIST OF PROPERTY OWNERS

APN	OWNER	MAILING ADDRESS	MAILING CITY	MAILING ZIP	ACREAGE
0529-281-16	FINK, ADELLE Y	12105 LA CASA LANE	LOS ANGELES, CA	90049	40.00
0529-281-18	CALICO SOLAR LLC	4800 N SCOTTSDALE ROAD #5500	SCOTTSDALE, AZ	85251	80.21
0529-281-21	WEST, IRA TR (IRA TRUST)	17732 TRAMONTO DR	PACIFIC PALISADES, CA	90272	39.95
0529-281-23	CALICO SOLAR LLC	4800 N SCOTTSDALE ROAD #5500	SCOTTSDALE, AZ	85251	10.00
0529-281-25	NELSON, CARL G AND DE LOISE	17907 VICINO WAY	PACIFIC PALISADES, CA	90272	80.22
0529-281-28	CALICO SOLAR LLC	4800 N SCOTTSDALE ROAD #5500	SCOTTSDALE, AZ	85251	10.00
0529-281-30	VEZZANI, ANDREA	42020 RONCOLO DI QUATTRO CASTELLA	ITALY	N/A	19.98
0529-281-31	MILLER, ROBERT A	8463 DESOTO AVE UNIT 31	CANOGA PARK, CA	91304	19.97
0529-281-33	KUSZYK, GLENN A	1080 OAK HILL VIEW DRIVE	GILBERTSVILLE, PA	19525	5.00
0529-281-34	CALICO SOLAR LLC	4800 N SCOTTSDALE ROAD #5500	SCOTTSDALE, AZ	85251	5.00
0529-281-35	GREENWOOD, H L	3870 CRENSHAW BLVD #230	LOS ANGELES, CA	90008	19.96
0529-281-36	DE GUZMAN, LEONARDO	3458 PUENTE AVE	BALDWIN PARK, CA	91706	20.04
0529-281-37	GALICIA, SANTIAGO REVOC TRUST 12/04	9435 LA ROSA DRIVE	TEMPLE CITY, CA	91780	19.99
0529-281-38	ANACAYA, CALEB A	9047 MAPLE ST	BELLFLOWER, CA	90706	20.04
0529-281-39	CHARLOTTE HOEFER REVOCABLE LIV TRUST	3870 E OAKWOOD	OAK CREEK, WI	53154	5.00
0529-281-40	MOSLEY LIV TR	4353 34TH ST APT 20D	SAN DIEGO, CA	92104	5.00
0529-281-41	AVANIAN, SARKIS	5432 LEMON GROVE AVE	LOS ANGELES, CA	90038	37.58
0529-281-42	AVANIAN, SARKIS	5432 LEMON GROVE AVE	LOS ANGELES, CA	90038	37.59
0530-241-03	UNITED STATES OF AMERICA	6221 BOX SPRINGS BLVD	RIVERSIDE, CA	92507-0714	634.85
0530-241-05	GOVERNMENT LAND	N/A	N/A	N/A	641.82
0530-241-06	GOVERNMENT LAND	N/A	N/A	N/A	633.31
0530-241-07	FREUND, MICHAEL	51 ROARING FORK DR	ASPEN, CO	81611	39.75
0530-241-11	JACKSON-OCHSNER FAM TR 11-29-4	600 N DARWOOD AVE	SAN DIMAS, CA	91773	41.08
0530-241-12	JACKSON-OCHSNER FAM TR 11-29-04	600 N DARWOOD AVE	SAN DIMAS, CA	91773	40.99
0530-241-14	CALICO SOLAR LLC	4800 N SCOTTSDALE ROAD #5500	SCOTTSDALE, AZ	85251	39.62
0530-241-16	SIBLING HOLDINGS INC	600 SKYLINE DRIVE	DIAMOND BAR, CA	91765	39.68
0530-241-22	PECORELLI, MICHAEL	640 WALNUT LN	ELK GROVE VILLAGE, IL	60007	9.94
0530-241-23	TRUJILLO, AVILIO	801 S MESA RD	BELEN, NM	87002	9.91
0530-241-24	CUNDIFF, JESSE	4556 SILVERBERRY CT	JACKSONVILLE, FL	32224	19.87
0530-241-25	VISOCKIS FAMILY TRUST	6714 MCLENNAN AVE	LAKE BALBOA, CA	91406	9.98
0530-241-26	CALICO SOLAR LLC	4800 N SCOTTSDALE ROAD #5500	SCOTTSDALE, AZ	85251	10.03
0530-241-28	PERREN, STEVEN Z	2891 GROVE LANE	VENTURA, CA	93003-1626	79.02
0530-241-31	LAM, REBECCA	11933 ACACIA GLEN COURT	SAN DIEGO, CA	92128	39.82
0530-241-32	BARBAKOW, DANIEL R	11661 SAN VICENTE BLVD STE 1010	LOS ANGELES, CA	90049	39.84
0530-241-33	DE VRIES, J L	10215 W PEREGRINE CIR	FOUNTAIN VALLEY, CA	92708	10.05

LIST OF PROPERTY OWNERS

APN	OWNER	MAILING ADDRESS	MAILING CITY	MAILING ZIP	ACREAGE
0530-241-37	SUKOV, SUSAN J	3023 DANALDA DR	LOS ANGELES, CA	90064	19.87
0530-241-38	SEGAL, JOSEPH	12126 ALBERTA DR	CULVER CITY, CA	90230	19.86
0530-241-39	SCHWIER, THOMAS P	13631 JEFFERSON ST	WESTMINSTER, CA	92683	39.63
0530-241-40	RAMOS, JULIO	337 SOUTH 37TH ST	SAN DIEGO, CA	92113	5.05
0530-241-41	WESTERN LAND BANK INC	P O BOX 1649	LOS ANGELES, CA	90001	5.07
0530-241-42	WONG, PETER	803 PUMA CANYON	GLENDORA, CA	91740	9.93
0530-241-43	DAVIS, DONALD L	450 E 246TH PLACE	CARSON, CA	90745	29.73
0530-241-44	DINH, QUYNH NGOC	4136 SHOREBREAK DR	HUNTINGTON BEACH, CA	92649	19.88
0530-241-45	SANTIAGO, BASILIO B	15739 GOLDEN SPUR CT	RIVERSIDE, CA	92504	19.80
0552-011-04	GOVERNMENT LAND	N/A	N/A	N/A	24.45
0552-011-04	GOVERNMENT LAND	N/A	N/A	N/A	78.98
0552-011-12	JONES, PATRICIA A TR	P O BOX 1792	UPLAND, CA	91785	12.51
0552-011-12	JONES, PATRICIA A TR	P O BOX 1792	UPLAND, CA	91785	5.79
0552-021-01	GOVERNMENT LAND	N/A	N/A	N/A	7.32
0552-021-01	GOVERNMENT LAND	N/A	N/A	N/A	583.35
0552-021-01	GOVERNMENT LAND	N/A	N/A	N/A	0.02
0552-021-02	GOVERNMENT LAND	N/A	N/A	N/A	71.10
0552-021-02	GOVERNMENT LAND	N/A	N/A	N/A	0.51
0552-021-02	GOVERNMENT LAND	N/A	N/A	N/A	0.91
0552-021-02	GOVERNMENT LAND	N/A	N/A	N/A	429.69
0552-021-02	GOVERNMENT LAND	N/A	N/A	N/A	3.97
0552-021-02	GOVERNMENT LAND	N/A	N/A	N/A	26.84
0552-021-02	GOVERNMENT LAND	N/A	N/A	N/A	32.95
0552-021-04	ATCHISON TOPEKA AND SANTA FE RR CO	N/A	N/A	N/A	50.26
0552-021-04	ATCHISON TOPEKA AND SANTA FE RR CO	N/A	N/A	N/A	18.13
0552-021-04	ATCHISON TOPEKA AND SANTA FE RR CO	N/A	N/A	N/A	3.19
0552-021-04	ATCHISON TOPEKA AND SANTA FE RR CO	N/A	N/A	N/A	9.28
0552-021-06	ATCHISON TOPEKA AND SANTA FE RR CO	N/A	N/A	N/A	2.36
0552-021-08	GOVERNMENT LAND	N/A	N/A	N/A	652.75
0552-021-13	GOVERNMENT LAND	N/A	N/A	N/A	451.45
0552-021-13	GOVERNMENT LAND	N/A	N/A	N/A	79.03
0552-021-30	UNITED STATES OF AMERICA	6221 BOX SPRINGS BLVD	RIVERSIDE, CA	92507-0714	507.24
0552-021-39	ATCHISON TOPEKA AND SANTA FE RR CO	N/A	N/A	N/A	3.08
0552-021-46	UNITED STATES OF AMERICA	6221 BOX SPRINGS BLVD	RIVERSIDE, CA	92507-0714	29.83
0552-021-47	SF PACIFIC PROPERTIES INC	2235 FARADAY AVE STE O	CARLSBAD, CA	92008	66.23

LIST OF PROPERTY OWNERS

APN	OWNER	MAILING ADDRESS	MAILING CITY	MAILING ZIP	ACREAGE
0552-031-02	UNITED STATES OF AMERICA	6221 BOX SPRINGS BLVD	RIVERSIDE, CA	92507-0714	638.15
0552-031-03	GOVERNMENT LAND	201 MISSION ST	SAN FRANCISCO, CA	94105	631.85
0552-031-04	GOVERNMENT LAND	N/A	N/A	N/A	614.12
0552-031-10	UNITED STATES OF AMERICA	6221 BOX SPRINGS BLVD	RIVERSIDE, CA	92507-0714	627.30
0552-031-11	GOVERNMENT LAND	N/A	N/A	N/A	636.46
0552-031-12	GOVERNMENT LAND	N/A	N/A	N/A	49.46
0552-031-12	GOVERNMENT LAND	N/A	N/A	N/A	565.02
0552-031-13	GOVERNMENT LAND	N/A	N/A	N/A	35.53
0552-031-13	GOVERNMENT LAND	N/A	N/A	N/A	13.08
0552-031-13	GOVERNMENT LAND	N/A	N/A	N/A	44.75
0552-031-13	GOVERNMENT LAND	N/A	N/A	N/A	468.55
0552-031-32	SOUTHERN CALIFORNIA EDISON COMPANY	N/A	N/A	N/A	1.63
0552-031-32	SOUTHERN CALIFORNIA EDISON COMPANY	N/A	N/A	N/A	3.80
0552-031-41	HUBBARD, DIXIE A TR	9301 CANYON MESA DR	LAS VEGAS, NV	89144	19.05
0552-031-43	UNITED STATES OF AMERICA	22835 CALLE SAN JUAN DE LOS LAGOS	MORENO VALLEY, CA	92553	501.31
0552-031-44	UNITED STATES OF AMERICA	22835 CALLE SAN JUAN DE LOS LAGOS	MORENO VALLEY, CA	92553	121.76
0552-041-10	GOVERNMENT LAND	N/A	N/A	N/A	637.47
0552-041-11	UNITED STATES OF AMERICA	6221 BOX SPRINGS BLVD	RIVERSIDE, CA	92507-0714	640.06
0552-041-12	GOVERNMENT LAND	N/A	N/A	N/A	603.30
0552-041-13	GOVERNMENT LAND	N/A	N/A	N/A	613.00
0552-041-14	GOVERNMENT LAND	N/A	N/A	N/A	643.26
0552-041-15	UNITED STATES OF AMERICA	6221 BOX SPRINGS BLVD	RIVERSIDE, CA	92507-0714	646.73
0552-041-16	GOVERNMENT LAND	N/A	N/A	N/A	647.55