# PLAN OF DEVELOPMENT

## CACA 048728

# McCoy Solar Energy Project

## Riverside County, California

**Submitted to:**

**Bureau of Land Management**
**California Desert District**
**Palm Springs South Coast Field Office**
**Palm Springs, California**

**Submitted by:**

## McCoy Solar, LLC

**A Subsidiary of**
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# ABBREVIATIONS AND ACRONYMS

| | |
|---|---|
| AC | alternating current |
| AF/yr | acre-feet per year |
| AF | acre-feet |
| Applicant | McCoy Solar, LLC |
| Basin | Palo Verde Mesa Groundwater Basin |
| BLM | Bureau of Land Management |
| BMP | best management practice |
| BSPP | Blythe Solar Power Project |
| CAISO | California Independent System Operator |
| Cal-OSHA | California Occupational Safety and Health Administration |
| Caltrans | California Department of Transportation |
| CBC | California Building Code |
| CDCA | California Desert Conservation Area |
| CDFG | California Department of Fish and Game |
| CEQA | California Environmental Quality Act |
| CFR | Code of Federal Regulations |
| CGS | California Geologic Survey |
| COD | Commercial Operation Date |
| CRS | Colorado River Substation |
| CSRL | California Soil Resource Lab |
| DC | direct current |
| DEIR | Draft Environmental Impact Report |
| DEIS | Draft Environmental Impact Statement |
| DOI | Department of Interior |
| DTSC | Department of Toxic Substances Control |
| DWR | Department of Water Resources |
| EAP | Emergency Action Plan |
| EFZ | Earthquake Fault Zone |
| FLPMA | Federal Land Policy Management Act of 1976 |
| gen-tie | generation-tie |
| gpd | gallons per day |
| I-10 | Interstate 10 |
| IBC | International Building Code |
| IIPP | Injury and Illness Prevention Plan |

| | |
|---|---|
| kV | kilovolt |
| LGIA | Large Generator Interconnect Agreement |
| McCoy Solar | McCoy Solar, LLC |
| MDAQMD | Mojave Desert Air Quality Management District |
| MSEP | McCoy Solar Energy Project |
| MW | megawatt |
| my | million years old |
| NECO | Northern and Eastern Colorado Desert Coordinated Management |
| NEPA | National Environmental Policy Act |
| NPDES | National Pollutant Discharge Elimination System |
| NRCS | Natural Resource Conservation Service |
| NTP | Notice to Proceed |
| O&M | operations and maintenance |
| OHV | off-highway vehicle |
| OSHA | Occupational Safety and Health Administration |
| $PM_{10}$ | particulate matter less than 10 micrometers in diameter |
| $PM_{2.5}$ | particulate matter less than 2.5 micrometers in diameter |
| POD | Plan of Development |
| PPA | power purchase agreement |
| PPE | personal protective equipment |
| Project | McCoy Solar Energy Project |
| PV | photovoltaic |
| RCFC&WCD | Riverside County Flood Control and Water Conservation District |
| ROW | right-of-way |
| RWQCB | Regional Water Quality Control Board |
| SCADA | Supervisory Control and Data Acquisition |
| SCE | Southern California Edison |
| SF | Standard Form |
| SPCC | Spill Prevention, Control, and Countermeasure |
| SWPPP | Stormwater Pollution Prevention Plan |
| U.S. | United States |
| U.S.C. | United States Code |
| USACE | U.S. Army Corps of Engineers |
| USEPA | U.S. Environmental Protection Agency |
| USFWS | U.S. Fish and Wildlife Service |
| USGS | U.S. Geological Survey |

# 1.0 PROJECT DESCRIPTION

## 1.1 INTRODUCTION

The McCoy Solar Energy Project (MSEP or Project) is currently the subject of a Standard Form (SF)-299 active right-of-way (ROW) grant application CACA-048728. The majority of the MSEP is on Bureau of Land Management (BLM) land, although there are three privately-owned parcels within unincorporated Riverside County that are also part of the Project. The Project proponent is McCoy Solar, LLC (McCoy Solar or Applicant), a subsidiary of NextEra Energy Resources, LLC. The first and original CACA-048728 application was filed on January 29, 2007 for 20,480 acres and was modified by a letter which reduced the requested property size by 9,920 acres to 10,560 acres. A second size reduction for the property was requested by a letter dated July 15, 2010, which removed an additional 3,040 acres from the property resulting in a size of approximately 7700 acres.

On December 1, 2010 an amended SF-299 for CACA-048728 was filed in order to: (1) add BLM lands needed to accommodate a 230 kilovolt (kV) generation tie (gen-tie) line and switchyard that will connect the MSEP with Southern California Edison's (SCE's) proposed Colorado River Substation (CRS) where the Project currently holds an interconnection position; (2) add BLM lands needed for access including roads to the Solar Plant Site; (3) add BLM lands needed for other potential linear facilities such as distribution power and telecommunication lines; and (4) change the solar technology for the Project from thermal solar to photovoltaic (PV).

The general Project location is presented in Figure 1-1. The Project will be located immediately to the north of Solar Millennium's recently-permitted thermal solar Blythe Solar Power Project (BSPP). Key Project components are as follows (see Figure 1-2):

- ***Solar Plant Site*** which includes all facilities that create a footprint in and around the field of solar panels – e.g., the solar field itself, substation, perimeter road, fencing, drainage, operations and maintenance (O&M) facilities, etc.
- ***Linear Facilities***
  - Gen-tie
  - Switchyard
  - Access road
  - Primary and secondary telecommunication lines
  - Distribution line

Note that the Linear Facilities are discussed in Section 3.0 of this Plan of Development (POD).

McCoy Solar has an active application for a Section 1703 (innovative technology) U.S. Department of Energy loan guarantee and expects to qualify for the Department of Treasury's accelerated tax credit program under the American Recovery and Reinvestment Act of 2009.

### 1.1.1 Type of Facility, Planned Uses, Generation Output

The Project is proposed to be up to a 750 megawatt (MW) PV solar power plant that will provide renewable energy to the California electrical grid through an interconnection at SCE's proposed CRS. The up to 750 MW Project will consist of Unit 1 and Unit 2.

### 1.1.2 Project Schedule

Units 1 and 2 of the MSEP will be built sequentially. Unit 1 will involve construction of the initial 250 MW and is anticipated to be completed in August 2014. Construction of Unit 2 will provide the additional 250 to 500 MW to reach up to 750 MW total. It is anticipated that construction on Unit 2 will begin following initiation of commercial operation for the Unit 1 (August 2015), and will be completed by October 2016. The preliminary Project Schedule is summarized in Table 1-1, below.

**Table 1-1 Preliminary Schedule**

| Activity | Date |
|---|---|
| Notice of Intent Published in Federal Register/Publication of NOP | September 2011 |
| Public Scoping Meeting | September 2011 |
| Scoping Report Prepared | October 2011 |
| Notice of Availability of Draft Plan Amendment/Environmental Impact Statement/Report (DEIS/DEIR) in Federal Register/Notice of Completion | February 2012 |
| Final DEIS/DEIR and Notice of Availability Circulated for Public Comment | August 2012 |
| 30 day expedited CA State Governor's consistency review begins | August 2012 |
| Record of Decision/ROW Grant/Board of Supervisors Hearing | November 2012 |
| Notice to Proceed/30 day judicial appeal period | December 2012 |
| Tortoise Fencing/Clearance Surveys – Unit 1 | March – April 2013 |
| Start of construction – Unit 1 | May 2013 |
| Initial synchronization to CRS – Unit 1 | November 2013 |
| Tortoise Fencing/Clearance Surveys – Unit 2 | March – April 2015 |
| Commercial Operation Date (COD) – Unit 1 | April 2015 |
| Initial synchronization to CRS – Unit 2 | July 2015 |
| COD – Unit 2 | December 2016 |

## 1.2 PROPONENT'S PURPOSE AND NEED FOR THE PROJECT

The purpose of the Project is to provide between 500 and 750 MW of renewable solar energy to the California power grid via SCE's proposed CRS.

California's Renewable Energy Portfolio Standard mandates that by the year 2010 a full 20 percent of the state's electric generation comes from renewable (green) generation. The target rises to 30 percent by 2017. Such aggressive goals, coupled with California's projected energy demand growth, dictate that large scale renewable generation projects are of utmost importance for state regulators, utilities, and citizens alike.

The expected public benefits of the proposed solar Project include, but are not limited to, added energy generating capacity to meet market demands, a new, low-carbon footprint energy source, and local construction and operations job creation.

## 1.3 GENERAL FACILITY DESCRIPTION, DESIGN, AND OPERATION

This section focuses on the design and operation of the facilities within the Solar Plant Site boundary. Note that the Linear Facilities and O&M details are, per BLM's POD outline guidance, addressed in Sections 3.0 and 4.0, respectively.

### 1.3.1 Project Location, Land Ownership, and Jurisdiction

The Solar Plant Site is proposed to be located in the Sonoran Desert, northwest of Blythe on BLM administered land and private land in an unincorporated area within Riverside County, California. The site is located in an undeveloped, rural area, approximately 13 miles northwest of the town of Blythe, California and approximately 32 miles east of the town of Desert Center, California, along Interstate 10 (I-10) (Figure 1-1).

The Solar Plant Site is located directly north of the Solar Millennium BSPP, approximately 6 miles north of I-10. There are no Wilderness Areas, Areas of Critical Environmental Concern, Desert Wildlife Management Areas, or Wildlife Habitat Management Areas within or adjacent to the Solar Plant Site (see Figure 1-2).

The Solar Plant Site can be accessed from the Mesa Drive/Airport exit from I-10 by heading west onto Black Rock Road. Approximately 1.5 miles west of Mesa Drive along Black Rock Road, a four-wheel-drive trail named Black Creek Road extends north towards the Solar Plant Site. As part of the Solar Millennium BSPP, it is anticipated that an improved access road will be installed from Black Rock Road to the southern edge of the BSPP. The MSEP will use this same access road up to the location where the MSEP gen-tie will cross the BSPP access road, from which point a new access road will be constructed around the eastern side of the BSPP to the Solar Plant Site (see Figure 1-2). Major equipment deliveries will likely be transported to the Solar Plant Site by truck/heavy hauler.

The site topography is relatively flat. The majority of the site has an elevation between approximately 480 and 800 feet above mean sea level. The elevation in the southwest corner rises from approximately 800 to nearly 1,700 feet above mean sea level where it enters mountainous terrain.

The review and approval of the proposed Project is within the jurisdiction of the BLM and the County of Riverside. The County of Riverside has authority over specific associated elements of the Project as may other federal, state, and local agencies overseeing land use, biological and cultural resources, storm water drainage and hydrology issues, roadway easements, and crossing encroachments.

The proposed MSEP gen-tie route extends south from the Solar Plant Site around the north and east sides of the proposed BSPP to the proposed SCE CRS south of I-10. Much of the route will parallel the Solar Millennium BSPP gen-tie at a distance of between 50 and 100 feet.

### 1.3.2 Legal Land Description

The Solar Plant Site will be mostly located within the approximately 7,700-acre BLM ROW Application Boundary. The Solar Plant Site will use approximately 5,363 acres of BLM land and 470 acres of private lands, for a total Solar Plant Site footprint of approximately 5,539 acres (Figures 1-2 and 1-3). Table 1-2 provides details about the land requirements for the Solar Plant Site.

Additional land will also be required to accommodate the Linear Facilities. Figure 1-4 illustrates the location of the Linear Facilities and Table 1-2 also includes details about the land required for the Linear Facilities (Section 3.1 provides additional details about the Linear Facilities.)

**Table 1-2 Summary of Land Requirements for the McCoy Solar Energy Project**

| Project Area | Meridian | Township | Range | Section | Aliquot Part |
|---|---|---|---|---|---|
| **MSEP Land Description** | | | | | |
| Solar Plant Site | 27 | 5S | 21E | 25 | SW |
| Solar Plant Site | 27 | 5S | 21E | 26 | entire section |
| Solar Plant Site | 27 | 5S | 21E | 27 | entire section |
| Solar Plant Site | 27 | 5S | 21E | 28 | entire section |
| Solar Plant Site | 27 | 5S | 21E | 29 | entire section |
| Solar Plant Site | 27 | 5S | 21E | 30 | E2 |
| Solar Plant Site | 27 | 5S | 21E | 32 | E2, NW, NESW |
| Solar Plant Site | 27 | 5S | 21E | 33 | entire section |
| Solar Plant Site | 27 | 5S | 21E | 34 | entire section |
| Solar Plant Site | 27 | 5S | 21E | 35 | entire section |
| Solar Plant Site | 27 | 5S | 21E | 36 | S2NE, W2, SE |
| **MSEP Generation-Tie Line** | | | | | |
| Proposed Gen-Tie Line | 27 | 5S | 22E | 31 | lot 1,2 |
| Proposed Gen-Tie Line | 27 | 6S | 22E | 6 | lot 1, 2, 3, 4, S2NE, SE |
| Proposed Gen-Tie Line | 27 | 6S | 22E | 7 | W2E2, SESE |
| Proposed Gen-Tie Line | 27 | 6S | 22E | 8 | lot 1, S2SW |
| Proposed Gen-Tie Line | 27 | 6S | 22E | 18 | lot 2, 3, 4, 5, 6, NWSW |
| Proposed Gen-Tie Line | 27 | 6S | 21E | 13 | TR 52, 54 |
| Proposed Gen-Tie Line | 27 | 6S | 21E | 14 | TR 56, 57 |
| Proposed Gen-Tie Line & Access Road | 27 | 6S | 21E | 23 | lot 2, 3, 5, 6, W2SW, TR 59 |
| Proposed Gen-Tie Line & Access Road | 27 | 6S | 21E | 26 | lot 1, TR 69, 71 |
| Proposed Gen-Tie Line & Access Road | 27 | 6S | 21E | 35 | TR 78A, 78B, 79, 80 |
| Proposed Gen-Tie Line | 27 | 7S | 21E | 2 | lot 4, 5, SWNE, SENW, SW, NWSE |
| Proposed Gen-Tie Line | 27 | 7S | 21E | 3 | S2S2 |
| Proposed Gen-Tie Line | 27 | 7S | 21E | 4 | S2S2 |
| Proposed Gen-Tie Line | 27 | 7S | 21E | 5 | S2S2 |
| Proposed Gen-Tie Line | 27 | 7S | 21E | 6 | SESE |
| Proposed Gen-Tie Line | 27 | 7S | 21E | 7 | E2E2 |

TR = tract

### 1.3.3 Total Acreage and General Dimensions of All Facilities and Components

The Solar Plant Site will be located northwest of Blythe, California on approximately 5,363 acres, plus 176 acres for the Linear Facilities. The overall site layout with general dimensions of key facilities and components is illustrated in Figure 1-5. The preliminary design has 125, 2 MW solar fields associated with Unit 1, arranged on the eastern side of the Solar Plant Site, and up to 250 solar fields for Unit 2, located west of Unit 1 within the Solar Plant Site. The approximate disturbance acreage and land use, based on the current preliminary design, is shown in Table 1-3. The general dimensions of the equipment to be located on the Solar Plant Site are presented in Table 1-4.

**Table 1-3 Estimated Overall Project Land Disturbance Acreage**

| Project Component | Permanent (Ac) |
|---|---|
| Solar Plant Site Total | 5,363 |
| • Solar Field (1) | 4,300 |
| • Perimeter/Fence Maintenance Roads (2) | 29 |
| • Support Facilities (3) | 18 |
| • Temporary Laydown Area | 15 |
| Linear Facilities Total (4) | 176 |

***Notes:***

1. The solar field area includes the internal access and maintenance roads between the solar arrays. This is an approximate number and will change with refinement of the solar plant layout.
2. An access road is provided around the perimeter fence for security inspections, and a maintenance road is provided around the outside of the fence.
3. Support facilities include the Project substation, water treatment area, and O&M Building.
4. The Linear Facilities Total acreage is based on a 100-foot wide legal ROW corridor for the gen-tie (i.e., 50-feet on either side of gen-tie centerline). The gen-tie corridor area would include the access road support towers and spur roads.

**Table 1-4 Estimated Quantity and Size of Solar Plant Site Components**

| Component Description | Approximate Total Acreage (AC) |
|---|---|
| Solar field (1) | 4,300 |
| O&M Building (3,000 square feet) | 0.07 |
| Project substation | 14 |
| Water treatment area (2) | 3 |
| Parking area (nominal 10,000 square feet) | 0.25 |
| Roads (perimeter and fence maintenance) (3) | 29 |

***Notes:***

1. The solar field area includes both units with a total of approximately 2.4 million PV modules. The solar field includes the internal access and maintenance roads between the 2 MW arrays.
2. Water treatment area includes space for the water treatment system, the water storage tanks and a potential 1 acre evaporation pond (see Section 1.3.8 and 1.3.12.)
3. An access road is provided around the perimeter fence for security inspections. A maintenance road is provided around the outside of the fence to provide for repairs and cleaning of debris.

The MSEP gen-tie will extend south from the Solar Plant Site, around the east side of the BSPP to the proposed SCE CRS south of I-10. The MSEP gen-tie, estimated to be approximately 14.5 miles long, will be parallel to the BSPP gen-tie for nearly half of the length, with the two lines being between 50 and 100 feet apart (see Figure 1-2). The proposed gen-tie is expected to permanently occupy an approximate 176-acre legal ROW corridor. This acreage is based on a total width of 100 feet (50 feet on either side of the line.)

### 1.3.4 Power Plant Facilities, Energy Conversion Process

The MSEP facilities will include the following major components or systems:

- PV modules/arrays
- Solar trackers
- Electrical Distribution System
- Collection and Step-up Transformation/Utility Interconnection

Each of these components is described in more detail in the following sections.

**PV Modules/Arrays**

The MSEP will utilize state-of-the-art PV technology, where the sun's light energy is converted directly into direct current (DC) electrical energy within the PV panels, referred to as "modules." The PV modules can be mounted together in different configurations, depending on the equipment selected, on a common support framework.

The modules are grouped together in solar fields, or arrays. The size of the array is based on the capacity of the equipment selected and is intended to generate the desired overall voltage and current output. The preliminary design of the MSEP solar arrays is for each to produce a net power output of 2 MW (as alternating current [AC]). The overall capacity of the MSEP (up to 750 MW) is achieved with a total of up to 375, 2 MW arrays. Solar energy technologies are advancing at a rapid rate and, as a result, the exact arrangement and nature of the PV systems will be determined during the final design.

**Solar Trackers**

The PV module rows will be oriented north-to-south. There are different types of mounting structures for the modules, depending on whether the modules will be fixed in one position or intended to track the sun's motion during the day. A solar tracking mechanism is used to maximize the solar energy conversion efficiency by keeping the modules perpendicular to the sun's energy rays throughout the day. This completed assembly of PV modules mounted on a framework structure is called a "tracker" as it tracks the sun from east to west. The MSEP will use single-axis trackers to increase the energy production from the arrays.

At this time, there are two types of tracker systems that may be selected for the MSEP; a ganged system or a stand-alone tracker system. A ganged tracker system utilizes one motor to control multiple rows of PV modules through a series of mechanical linkages and gearboxes, while a stand-alone system utilizes a single motor and gearbox per row of PV modules. The exact tracker manufacturer and model will be determined in the final design. However, all trackers are intended to function identically in terms of following the motion of the sun.

Module layout and spacing is typically optimized to balance energy production versus peak capacity, and depends on the sun angles and shading due to the surrounding horizon of the MSEP site. The spacing between the rows of trackers is dependent on site-specific features and will be identified in the final design.

**Electrical Distribution System**

The PV modules generate a low voltage DC electrical output that is not suitable for direct connection to an AC utility grid such as is used in the United States. The electrical distribution system will be designed to transform the output power from the PV modules from DC to AC and then from low voltage to transmission level voltage for connection to the grid, and to supply power to each tracker's auxiliary electrical equipment and systems.

The DC current from the arrays will be transmitted to the associated voltage inverter through underground DC electrical cables. (The number of modules connected to each inverter is dependent on the specific model of modules and inverters and their capacities, which will be selected in the final design.) The resulting AC current from each individual inverter will then be routed through underground AC cables to the corresponding, oil-filled, medium voltage, step-up transformer. Based on the preliminary design, the output voltage from the inverter (265 volts) will be increased to the desired substation feed voltage (34.5 kV) by these step-up transformers.

**Collection and Step-up Transformation/Utility Interconnection**

The Project substation will consist of an area of approximately 14 acres (approximately 7 acres per unit) and will be located on the eastern side of the Solar Plant Site. The Project substation is anticipated to consist of parallel sets of internal power distribution systems, (i.e., 34.5 kV buses and circuit breakers, disconnect switches, and main step-up transformers) to increase the voltage to the 230 kV transmission line voltage.

The power from the combined solar arrays for each unit will be transformed through one of the main step-up transformers dedicated for that unit, from the medium distribution voltage (34.5 kV) to the 230 kV transmission line voltage. The substation and interconnections will be built for 230 kV and will operate at that nominal voltage.

Shield wires and lightning arrestors will be included to protect the substation equipment and personnel against lightning strikes.

The electrical power generated by the MSEP will be transmitted from the MSEP substation through the proposed double-circuit gen-tie that will be routed south from the Solar Plant Site, around the east side of the proposed BSPP, across I-10, and then west to the proposed SCE 230 kV CRS (see Figure 1-2). Nearly half of the route will parallel the BSPP gen-tie at a distance of between 50 and 100 feet. Additional detail on the gen-tie is included in Section 3.0.

### 1.3.5 Numbers and General Dimensions of Solar Array, Substations, Transmission Lines, Access Roads, Buildings, and Parking Areas

The preliminary design has 125, 2 MW solar fields associated with Unit 1, arranged on the eastern side of the Solar Plant Site, and up to 250 solar fields for Unit 2, located west of Unit 1 within the Solar Plant Site. The construction of Unit 1 of the MSEP will include the access road, water treatment system, initial gen-tie (consisting of the support towers and first circuit), O&M Building, parking area, and the first 125, 2-MW arrays.

Each array is estimated to cover approximately 14.8 acres. The overall Solar Plant Site, including general areas, is shown on Figure 1-5 and on-site areas and Linear Facilities are identified in Table 1-3.

### 1.3.6 Temporary Construction Workspace, Yards, and Staging Areas and Construction Disturbance Area

Estimated land disturbances for construction and operation of the Project, including the solar arrays, and other Project facilities, are presented in Table 1-3.

### 1.3.7 Geotechnical Studies and Data Needs, Including Solar Insolation Testing

**Geotechnical Survey**

Before entering the MSEP site to collect any additional information, the Applicant will request permission from the BLM and obtain the proper approvals in advance.

A geotechnical site investigation, laboratory testing, and engineering analyses may be required to determine the engineering properties of the soil and bedrock on the MSEP. The information developed and documented in a geotechnical report will be used in the grading plan and to design the foundations for the solar field, the O&M Building, the plant substation, and the transmission line structures. The geotechnical site investigation will consist of advancing borings

to sample soil and/or bedrock for laboratory testing and analysis. The investigation will also include geologic and seismic hazard analysis to ensure provision of adequate design parameters.

Geotechnical surveys are expected to take place during two separate field events. In the first field event, expected to take place during the summer/fall of 2011, geotechnical data will be collected in select locations that will not require vehicle use off of existing disturbed roads. In the second field event, expected to take place in 2012, more extensive surveys will be conducted that will likely involve off-road vehicle use. The Applicant will obtain necessary land use permits and conduct associated National Environmental Policy Act (NEPA) review prior to these survey efforts.

To minimize initial ground disturbances, the geotechnical site investigation will likely consist of soil borings of about 12 to 24 inches in diameter to sample soil and/or bedrock for laboratory testing and analysis. The soil boring diameter is based on the anticipated presence of gravelly soils. Boring depths are expected to range from 10 to 35 feet in depth, depending on local ground conditions and proposed extent of site grading. Borings will be widely spaced so as to obtain a sampling of the various subsurface soil types and conditions, but will also be aimed at targeting zones anticipated to require remedial grading and where structures are proposed.

For the subsequent detailed design of the Project, additional borings may be required. The final geotechnical studies will include the determination of the depth to groundwater, although it is anticipated that geotechnical borings at the site will not extend to groundwater and are therefore not subject to permitting by the Colorado River Basin Regional Water Quality Control Board (RWQCB). Likewise, exploratory soil borings are not subject to excavation permits, but are subject to Underground Service Alert Notification.

An engineering geologist(s), certified by the State of California, will be assigned to the Project to carry out the duties required by the current International Building Code (IBC) or California Building Code (CBC) (2010 or latest edition), including preparation of an Engineering Geologic Report. The engineering geologist will periodically monitor geologic conditions during construction, approve design features and mitigation measures used to protect the facility from geologic hazards, and prepare the final Geologic Grading Report.

### Topographic Survey

In order to refine the Project design and, in particular, to determine appropriate stormwater protection measures for the site, the Applicant has used both the U.S. Geological Survey (USGS) topographic map and more recent (2005) digital terrain data collected using airborne Interferometric Synthetic Aperture Radar. The purpose of this topographical information is to more accurately identify the disturbance area, the amount of cut and fill needed, and to better locate geotechnical and environmental studies. Additional topographic data will be developed as the detailed design proceeds.

### Environmental Baseline Surveys

Section 5.0 covers the major solar site environmental surveys for the Project. Before any geotechnical boring or other site data collection are begun on the site, environmental clearance surveys will be completed in areas to be used for geotechnical borings or data collection. These are described below. The meteorological stations are already on-site so no additional surveys are needed for them.

**Biological Surveys**

Botanical, general habitat, and wildlife inspections will be conducted before ground surface disturbance, including geotechnical or water well drilling. The major biological work plans for the entire BLM survey of the MSEP site have already been prepared and the biologist will know the species and habitat issues on the site before any activity in the field begins. The BLM Palm Springs office will be notified before a qualified biologist familiar with special status species, biological habitats needing protection, and mitigation methods goes on-site. The biologist will have the authority to assure the drilling crew complies with any directions given. A brief report of this biological survey will be filed with the BLM following the site activities.

**Cultural Surveys**

The Applicant understands that in order to support the NEPA process, as well as to support BLM in its government-to-government consultation with Native Americans and in its Section 106 consultation process, a complete Class I survey, including Information Center site record review, literature review, and a review of BLM records, will be conducted before any invasive work begins on the site.

The Applicant will conduct a Class I survey and prepare a preliminary report with the results from that survey before any drilling or other data collection activity begins. Before engaging in fieldwork, the BLM will be contacted and approval to conduct work will be sought. Once approved by the BLM, an archaeologist experienced in the MSEP area will go on-site during the activities to first determine if any cultural resources are in the area and second to assure no impact to cultural resources occur in advance of entry of any construction or drilling equipment. The archaeologist will have the authority to assure the drilling crew complies with any directions given. A brief report of this cultural survey will be filed with the BLM following the site activities.

**Solar Insolation/Metering**

The National Renewable Energy Laboratory maps provide general insolation data, and site-specific information regarding insolation, haze, cloud cover, and wind speed that are crucial for project design and financing. To augment this data, the Applicant has installed solar irradiance meters and meteorological towers (see Photo 1.1). Solar energy performance data continue to be collected to determine the value of solar energy in the Project area. Wind data collection instruments are also on-site.

Photo 1.1 – View of typical solar irradiance meter and meteorological tower.

**Groundwater Testing**

The BLM issued the Applicant a Temporary Use Permit for groundwater drilling and testing on November 1, 2008. At this time, it is not expected that any additional wells will be needed for groundwater/aquifer testing purposes. Pump testing data recently collected at the adjacent BSPP site is expected to be sufficient. One or more additional test wells may be needed to gather additional information on aquifer characteristics and groundwater elevations. The water quantity and quality data acquired will be used to design the facility's potable water and solar collector wash water systems. Well permits will be obtained from the Riverside County Department of Public Health, Environmental Health Services, Safe Drinking Water Permit Section. Detailed modeling to assess groundwater at the Project is currently in process.

**Other Surveys**

In consultation with the BLM, other surveys will be conducted as needed to meet the data adequacy requirements of the NEPA process. Descriptions of the major NEPA studies are given in detail in Section 5.0.

### 1.3.8 Ancillary Facilities (Administrative and Maintenance Facilities and Storage Sites)

- O&M Building
- Water supply and treatment system
- Water storage tanks

The MSEP will include an O&M facility, housed in an approximately 3,000 square foot building. The O&M Building will be located adjacent to the MSEP access road and the 24-foot wide security gate. The O&M Building will be a pre-engineered metal building with metal siding and roof. The building will provide a small administrative area, a work area for performing minor repairs and a storage area for spare parts, transformer oil, and other incidental chemicals. The building will be supported on reinforced concrete mat foundations or individual spread footings as determined during detailed design. The floor will consist of a reinforced concrete slab. The administration area will be air conditioned and include offices, break room, rest rooms, and locker rooms with showers.

Currently it is anticipated that the plant water needs will be supplied from groundwater. The groundwater will be treated to the necessary water quality for cleaning the PV modules using a conventional water treatment system.

The water treatment system design has not been developed, but may include either a trailer-mounted water treatment system or a free-standing system. The water treatment system may provide the water supply for potable use by on-site workers and the treated water for washing the PV modules. A small amount of water may also be used for dust control within the Project area.

There will be several tanks on-site for the storage of the raw water, treated water, and potable water for the MSEP. The raw water storage capacity will also provide the fire supply. The water treatment area, intended to contain the water treatment system, water storage area and, if required, a 1-acre evaporation pond, is estimated to be approximately 3 acres and is shown on Figure 1-5. The possibility of the evaporation pond is discussed in Section 1.3.12.

Final water storage tank volumes will be determined during the detailed design phase of the Project.

### 1.3.9 Water Usage, Amounts, Sources

Groundwater in the area of the MSEP is contained within the Palo Verde Mesa Groundwater Basin (Basin) of the Colorado River Hydrologic Region. The Basin is bound by the McCoy Mountains to the west, the Little Maria Mountains to the northwest, and the Big Maria Mountains to the northeast.

Water in sufficient quantity and quality is expected to be available from wells to be installed at the Solar Plant Site. Detailed modeling to assess groundwater at the Project is currently in process. A minimum of two on-site groundwater supply wells will be installed. The location and construction of these wells will be identified in the detailed design. If possible, one of these wells will be located near the water treatment system area. The MSEP well field will also include a sufficient number of standby wells to provide the MSEP with water in the event the primary wells are shut down for maintenance. As currently planned, the wells will pump groundwater from the Basin, with a water elevation of approximately 250 feet relative to mean sea level. Water quality is expected to be unsuitable for potable use without treatment with between 730 and 3,100 milligrams per liter of total dissolved solids (based on investigations performed for the BSPP).

It is anticipated that water use during construction will be from the on-site production wells that will be installed early in the development process. Water usage for the construction period will depend on the actual construction activities.

Initial construction water usage will be in support of site preparation and grading activities. During earthwork for the grading of access roads foundations, equipment pads and Project components, the main use of water will be for compaction and dust control. Smaller quantities will be required for preparation of the concrete required for foundations and other minor uses. Subsequent to the earthwork activities, water usage will be in support of dust suppression and normal construction water requirements that are associated with construction of the building, substation, internal access roads and solar arrays.

Based on similar projects, the Applicant estimates that the average water usage rate during construction will be approximately 180 to 200 gallons per minute. The total water usage during construction of Unit 1 is estimated to be approximately 450 acre-feet (AF), based on similar projects. The water demand for Unit 2 construction should be reduced as some of the support structure will have been installed as part of Unit 1. Therefore, the overall construction water usage is anticipated to be between 650 and 750 AF.

The PV technology used at the MSEP does not require water for the generation of electricity. During MSEP operation, water use will be limited to dust control and PV array washing. Drinking (potable) water will be supplied for workers on-site, and is estimated to be approximately 10,000 gallons per month (approximately 0.5 AF per year [AF/yr]), varying seasonally and by work activities. The potable water may be brought to the Solar Plant Site by tanker truck, or groundwater may be used with a package water treatment system to treat the water to meet potable standards.

The amount of water required to clean the PV modules twice per year is estimated to be about 9.6 million gallons per year (approximately 30 AF/yr) as shown in Table 1-5. The modules will be cleaned only on an as-needed basis, depending on site events and conditions. The water used for module cleaning is not anticipated to require disposal due to the extremely high evaporation rate at the site.

**Table 1-5 Estimate of Daily and Annual Water Consumption Requirements**

| Water Use | Annualized Average Rate (gpd) | Estimated Peak Rate (gpd) | Estimated Annual Use (AF) |
|---|---|---|---|
| PV Module Cleaning, Dust Control (1) | 50,000 | 70,000 | 30 |
| Potable Water (2) | 275 | 460 | 0.5 |

***Notes:***

1. Water consumption based on the volume required to wash the PV panels approximately twice per year.
2. Annual potable consumption based on 7 day work week.

The internal access roads will not be heavily traveled during normal operations, and a BLM-approved dust suppressant will be applied to control dust. Water may be used to supplement the dust suppressant in some areas on a limited basis. The concentrate from a reverse osmosis treatment unit (if required for on-site water treatment) might be used for dust control by blending it with water from the on-site water wells.

Based on the anticipated uses, the estimated quantity of water needed for the MSEP O&M will be on the order of 30 AF/yr.

### 1.3.10 Erosion Control and Storm Water Drainage

Based on the U.S. Army Corps of Engineers' (USACE's) determination that the desert washes on the adjacent BSPP are not subject to USACE jurisdiction, it is anticipated that the USACE will reach the same "no jurisdiction" determination for the washes on the MSEP. McCoy Solar is working with the USACE to receive a formal non-jurisdictional determination for the MSEP.

California state law, under the Porter-Cologne Act, provides the RWQCB the authority to require projects greater than 1 acre in size to file a Report of Waste Discharge with them. The RWQCB may require a plan for managing the surface water runoff and an Industrial Storm Water Discharge Permit. They may also require a Storm Water Pollution Prevention Plan (SWPPP) and description of the Best Management Practices (BMPs) that will be used to control discharges of sediments and other pollutants from the Solar Plant Site. These plans follow specific, standard published guidelines. Determinations of the manner in which these requirements will be implemented by the RWQCB have not yet been made for the MSEP.

The preliminary storm water drainage for the Solar Plant Site is designed to maintain predevelopment hydraulic conditions in the natural watercourses and to minimize the generation of non-point source pollutants. The concept employed for the design and layout of the solar arrays is to minimize the placement of the arrays in large, established channels (to the extent practical) and utilize equipment and protective measures that will allow the existing drainage patterns to be maintained where possible.

The storm water flow that would traverse the planned Solar Plant Site footprint originates in the McCoy Mountains southwest and west of the site, with sheet flow drainage collecting in rills and gullies The existing ground elevations generally decrease from west to east and south to north, resulting in an initial drainage towards the northeast and southeast, away from the mountainous area. The drainage gradually shifts towards the east and south as it moves farther away from the McCoy Mountains.

On-site run-on to the solar fields follows natural grade to the southeastern direction. Minimal grading within the solar field is expected to be required to allow access to the solar arrays. This will maintain the on-site runoff close to the existing conditions.

The tracker equipment currently available is designed to mount on strong steel supports and may be designed and installed to minimize the impact of storm water flow on the equipment. Therefore, although the details of the storm water drainage will be evaluated in the detailed engineering design, the preliminary approach is to maintain the natural flows where possible. Electrical components within the solar arrays, such as inverters, will be placed out of main drainage channels and weather/water proofed to the extent possible.

The Project substation at the northeast corner of the site will be constructed elevated from the existing grade for protection.

Detailed erosion control measures (i.e., temporary and permanent) will be developed once the final design and topographic details are identified.

### 1.3.11 Vegetation Treatment and Weed Management

A plan will be developed for control of noxious weeds and invasive species that could occur as a result of surface disturbance activities at the site. The plan will address monitoring, education of O&M personnel on weed identification, the manner in which weeds spread, use of any pesticides, and methods for treating infestations. Pesticide use will be limited to non-persistent, immobile pesticides and will only be applied in accordance with label and application permit directions and stipulations for terrestrial and aquatic applications. Any herbicide applications will be conducted within the framework of BLM and Department of Interior (DOI) policies, and will entail only the use of U.S. Environmental Protection Agency (USEPA) registered pesticides.

To decrease the risk of fire, all vegetation underneath the trackers will be managed with a BLM-approved herbicide in accordance with guidance provided in the BLM Programmatic Environmental Impact Statement; Vegetation Treatments Using Herbicides on BLM Lands in 17 Western States (BLM 2007).

### 1.3.12 Waste and Hazardous Materials Management

Waste management incorporates processes leading to proper collection, treatment, and disposal of wastes. Wastes include wastewater and evaporation ponds (if required), solid and non-hazardous waste, and hazardous waste.

A variety of safety-related plans and programs will be developed and implemented to ensure safe handling, storage, and use of hazardous materials (e.g., Hazardous Material Business Plan). Plant personnel will be supplied with appropriate personal protective equipment (PPE) and will be properly trained in the use of PPE and the handling, use, and cleanup of hazardous materials used at the facility, as well as procedures to be followed in the event of a leak or spill. Adequate supplies of appropriate cleanup materials will be stored on-site.

#### Hazardous Chemicals

A variety of hazardous materials will be used and stored during construction and operation of the MSEP, as summarized below. Hazardous materials that will be used during construction include gasoline, diesel fuel, oil, lubricants, and small quantities of solvents and paints. During construction, all hazardous materials will be stored on-site in storage tanks/vessels/containers that are specifically designed for the characteristics of the materials to be stored. The storage facilities will include secondary containment in case of tank/vessel failure.

During operations, hazardous materials that may be used at the facility will be stored inside the O&M Building to prevent exposure to the elements and reduce the potential for accidental releases. The chemicals will be segregated by type, and spill containment will be provided inside the warehouse building storage area.

The quantities stored on-site will be evaluated to identify the required usage and maintain sufficient inventories to meet use rates without stockpiling excess chemicals. Those chemicals that may be present may include some or all of the following:

- Fuel (diesel)
- Fertilizers
- Hydraulic fluid
- Transformer oil

If a portable, trailer-mounted water treatment system can meet the MSEP flow and water quality demands, no additional chemicals will be required for maintenance and regeneration of the system. However, if a site-specific water treatment system is used, the regeneration process may require additional chemicals to maintain the water treatment system performance, potentially including the following:

- Sodium Hydroxide solution
- Sodium Hypochlorite solution
- Sulfuric Acid solution

The determination of the MSEP water treatment system requirements and the decision made about whether a portable or stationary system will be needed will be made during the detailed design process. If a stationary treatment system is identified, the chemicals required and the associated Material Safety Data Sheets will be provided as part of the design.

A variety of safety-related plans and programs will be developed and implemented to ensure safe handling, storage, and use of hazardous materials (e.g., Hazardous Material Business Plan). Plant personnel will be supplied with appropriate PPE and will be properly trained in the use of PPE and the handling, use, and cleanup of hazardous materials used at the facility, as well as procedures to be followed in the event of a leak or spill. Adequate supplies of appropriate cleanup materials will be stored on-site.

**Wastewater and Evaporation Ponds**

There may be two separate wastewater collection systems, one for the sanitary wastes and a second system to address the process wastewater.

The sanitary wastewater system will collect sanitary wastewater at the O&M Building. Portable chemical toilets will be provided for workers in the solar fields. The sanitary wastewater from sinks, toilets, showers, other sanitary facilities in the O&M Building will be discharged to a sanitary septic system and on-site leach field. The septic system will be designed during the detailed design effort, following the determination of the final orientation and arrangement of the MSEP. The septic system will be permitted and designed in accordance with State and Riverside County regulations.

If a portable, trailer-mounted water treatment system is used for the MSEP, the regeneration of the system will be handled off-site, resulting in no wastewater generation on-site. If the water

treatment system is regenerated on-site, wastewater may be generated, and chemicals such as sulfuric acid and sodium hydroxide may be used and stored on-site in the O&M Building.

Depending on the water quality and the need for on-site regeneration of the water treatment system, a small (approximately 1 acre) evaporation pond may be required. The need and design of the evaporation pond will be studied in the detailed design phase. If it is required, the evaporation pond would be located near the water treatment system, within the water treatment area (Figure 1-5).

**Solid and Non-Hazardous Waste**

Construction, operation, and maintenance of the MSEP will generate non-hazardous solid wastes typical of power generation or other industrial facilities. The plant wastes that are produced will include oily rags, worn or broken metal and machine parts, defective or broken electrical materials, other scrap metal and plastic, insulation material, empty containers, paper, glass, and other miscellaneous solid wastes including the typical refuse generated by workers. These materials will be disposed by means of contracted refuse collection and recycling services. Waste collection and disposal will be in accordance with applicable regulatory requirements to minimize health and safety effects.

**Hazardous Waste**

Small quantities of hazardous wastes will be generated during MSEP construction and operation. Hazardous wastes generated during the construction phase will include substances such as paint and primer, thinners, and solvents. Hazardous solid and liquid waste streams generated during MSEP operations include substances such as used hydraulic fluids, used oils, greases, filters, etc., as well as spent cleaning solutions and spent batteries. To the extent possible, both construction and operation-phase hazardous wastes will be recycled. The Applicant or its contractor will obtain a hazardous waste generator identification number from the California Environmental Protection Agency, Department of Toxic Substances Control (DTSC) prior to generating any hazardous waste.

All spills will be reported to BLM, and spills greater than 25 gallons will be reported to the RWQCB. A sampling and cleanup report will be prepared and sent to the RWQCB to document each spill and clean up. Each spill, regardless of amount, will be cleaned up within 48 hours and a spill report completed. Copies of the spill and cleanup reports will be kept on-site.

### 1.3.13 Fire Protection

Fire-protection systems will be provided to limit personnel injury, property loss, and Project downtime resulting from a fire. Fires are most likely to be introduced from human activity, but may also occur as a result of lightning strikes or equipment malfunctions.

During construction activities a water truck or other portable trailer-mounted water tank will be kept on-site and available to workers for use in extinguishing small man-made fires. All vehicles working on-site will also carry a portable fire extinguisher. An Emergency Action Plan (EAP) will designate responsibilities and actions to be taken in the event of an emergency during construction of the Project. The EAP, including fire prevention and suppression, and a worker safety plan will all be provided to BLM for approval prior to requesting the Notice to Proceed (NTP).

Regular Project operations typically have a low risk of introducing fires since most electric lines within the PV arrays are buried and the majority of the materials within the solar arrays are non-combustible (aluminum, steel or glass). To decrease the risk of fire, all vegetation underneath the solar modules will be managed with a BLM-approved herbicide. A pre-emergent herbicide is applied in the spring, and spot foliar applications will be used throughout the year to maintain the area free of vegetation.

The fire protection systems for the Solar Plant Site operations may include a fire protection water system for protection of the O&M Building, portable water tanks (Buffalos), and portable fire extinguishers. The Project's fire protection water system will be supplied from a dedicated 10,000-gallon water storage tank located on the Solar Plant Site near the main entrance.

Fire support services to the site will be under the jurisdiction of the Riverside County Fire Department. Fire Station No. 43 in Blythe, equipped with a medic engine, a squad, a county engine, and a water tender, and Fire Station No. 45 located at the Blythe airbase, equipped with a medic engine, are the closest stations to the MSEP area. The closest hazmat responder is Fire Station No. 81, located in Palm Desert. County and local fire departments will be notified of the fire protection plan and an EAP will be submitted to the fire authority for approval.

### 1.3.14 Site Security and Fencing (During Construction and Operations)

The Solar Plant Site will be fenced appropriately to restrict public access during construction and operations. Fencing will be installed as part of the biological clearance surveys. During the construction and initial synchronization of Unit 1 to the CRS, the perimeter fence for the Solar Plant Site will be placed around the Unit 1 solar field area. When the biological clearance surveys for Unit 2 are initiated, the security fence will be relocated to cover the full area for the Solar Plant Site, as shown on Figure 1-5.

Chain-link security fencing will be installed around the site perimeter, switchyard, and other areas requiring controlled access. The security fence will be 8 feet tall, topped with one foot of barbed wire (three strands) mounted on 45-degree extension arms and posts set in concrete.

Appropriate protective measures will be incorporated into the site security and fencing design to accommodate and protect local sensitive species. The requirement and design for such measures will be identified during environmental studies. The presence of desert tortoise will require special fencing designed to protect the tortoise, as shown in Figure 1-6.

Controlled access gates will be located at the entrances to the facility. Site gates will be swing or rolling type access gates. Access through the main gate will require an electronic swipe card, preventing unaccompanied visitors from accessing the facility. All facility personnel, contractors, and visitors will be logged in and out of the facility at the main office during normal business hours. Visitors and contractors will be allowed entry only with approval from a staff member at the facility.

Additional security may be provided by the use of closed circuit video surveillance cameras and intrusion systems as required for protection of the power production facility. Outdoor night lighting will be primarily at the O&M Building and the Project substation, although some portable lighting may be required for maintenance activities that must be performed at night. Lighting will be kept to the minimum required for safety and security; sensors and switches will be used to keep lighting turned off when not required, and all lights will be hooded and directed to minimize backscatter and off-site light.

### 1.3.15 Electrical Components, New Equipment, and Existing System Upgrades

The electrical components required on-site for the Project will include the solar arrays, inverters, step-up transformers, the Project substation, and the gen-tie initiation/termination. The Project substation is anticipated to consist of parallel sets of internal power distribution systems, including 34.5 kV buses and circuit breakers, disconnect switches, and main step-up transformers to increase the voltage to the 230 kV transmission line voltage.

The Project's on-site substation will connect via a distinct, approximately 14.5-mile long, gen-tie, routed from the Project substation to the proposed SCE CRS. The gen-tie will be supported by either steel or concrete monopole structures (towers) at approximately 800 foot intervals (based on the preliminary estimates).

Additional details on the gen-tie lines for the two units are included in Section 1.3.16 and Section 3.1.

A Supervisory Control and Data Acquisition (SCADA) system will be included for remote control and monitoring of inverters and other equipment within the MSEP.

New telecommunications lines will connect the Project substation with the electrical grid through SCE's proposed CRS. As required for connection and interaction with the electrical grid, there will be two independent telecommunication lines provided. The primary telecommunication line will be hung at the top of the gen-tie support structures (i.e., towers) and the secondary telecommunication line will be located within the disturbance area of the access or maintenance roads. The arrangement of the secondary telecommunications line will be determined during the detailed design for the Project.

### 1.3.16 Interconnection to Electrical Grid

The two units from MSEP will interconnect to SCE's proposed CRS through the proposed approximately 14.5 mile long gen-tie corridor that uses a single set of support towers and a separate circuit for each unit. The gen-tie monopole structures will be designed for double circuit use, with the first circuit (from Unit 1) being hung during the gen-tie construction. The Unit 1 circuit will connect to the electrical grid through a 230 kV switchyard that is subsequently connected to SCE's proposed CRS. The switchyard will be located in the vicinity of SCE's CRS, as shown on Figure 1-2.

As part of the construction for Unit 2, the second set of conductors (i.e., the second circuit) will be added to the existing MSEP gen-tie structures and follow the same gen-tie corridor from the Project substation to the proposed SCE CRS. The conductors from Unit 2 will be routed directly to the proposed CRS rather than to the switchyard.

The gen-tie support towers are estimated to be approximately 80 to 90 feet tall, depending on the location and local terrain, with final heights as determined during detailed design. The towers will be reinforced as necessary to withstand design loads. The lines will be insulated from the poles using porcelain insulators engineered for safe and reliable operation. Shield wires will be included along the length of the lines to protect against lightning strikes.

The final transmission tower design including tangent, angle, dead end, and pull-off structures and associated hardware will be determined during the final engineering of the proposed interconnection. The proposed gen-tie location is shown on Figure 1-2.

### 1.3.17 Spill Prevention and Containment for Construction and Operation of Facility

During the construction of the facility, fuel for construction equipment may be provided by a fuel truck or it may be stored on-site in aboveground storage tanks. These tanks are normally designed to be used at construction sites and are double-walled with built-in containment. The volume of each individual tank is not expected to exceed the 1,320 gallon limit, which triggers the 40 Code of Federal Regulations (CFR) 112 requirement for a Spill Prevention, Control, and Countermeasure (SPCC) Plan, but it is possible that there may be multiple fuel tanks for different fuels (i.e., gasoline and diesel) and oils, so the total volume may exceed the threshold.

If the facility exceeds the 1,320 gallon level, the contractor will be required to prepare a SPCC Plan for the construction work. This SPCC Plan will include procedures, methods, and equipment supplied during construction to prevent discharges of petroleum from reaching navigable waters. SPCC plans will be certified by a Registered Professional Engineer and a complete copy will be maintained on-site. Due to the size of the construction areas, fueling of some construction vehicles will likely occur in the construction area. Other mobile equipment will return to the laydown area for refueling. Special procedures will be identified to minimize the potential for spills, and spill control kits will be carried on all refueling vehicles.

A SPCC Plan will be prepared for the facility operation, due to the volume of oil contained in the main electrical transformers. The local administering agency is the USEPA; however, the Riverside County Department of Environmental Health is the local Certified Unified Program Agency that is responsible for inspections and approvals related to the SPCC program.

There also will be a variety of chemicals stored and used during construction and operation of the Project. The storage, handling, and use of all chemicals will be conducted in accordance with applicable laws, ordinances, regulations, and standards. Chemicals will be stored in appropriate chemical storage facilities. Bulk chemicals will be stored in storage tanks, and other chemicals will be stored in returnable delivery containers. Chemical storage and chemical feed areas will be designed to contain leaks and spills. Containment berm and drain piping design will allow a full-tank capacity spill without overflowing the containment berms. For multiple tanks located within the same bermed area, the capacity of the largest single tank will determine the volume of the bermed area and drain piping.

### 1.3.18 Health and Safety Program

Worker safety is of utmost priority at the Project location and is documented through worker safety practices and training. A Safety and Health Program will be implemented for MSEP to ensure worker safety and minimize worker hazards during construction and operation. This program will include an Injury and Illness Prevention Program (IIPP), a PPE Program, and an EAP.

During construction of the proposed MSEP, written safety programs and procedures will include a hearing conservation program, respiratory protection program, fall protection procedures, hot work procedures, cranes and rigging/lifting requirements, heavy equipment procedures, and others. An EAP will designate responsibilities and actions to be taken in the event of an emergency during construction of the MSEP. The EAP, including fire prevention and suppression, and a worker safety plan will all be provided as a part of the construction planning. These plans will be submitted to BLM for approval before requesting a NTP to construction.

In addition, the contractor(s) working at the site will provide a written Health and Safety Plan for their construction workers. These written safety programs and procedures will include details on hazards that may be encountered. Fire watches may be required during hot work on-site.

Prior to the startup of the MSEP, an operational emergency response plan will be developed that will be used by the operators at the plant. A facility IIPP will be developed for the overall facility to address the health and safety issues that may be encountered during normal work activities or under unusual or emergency conditions. The IIPP will provide detailed information and the workers will be trained about the hazards associated with the high voltage systems, mechanical systems, and operations found in the solar power plant.

Safety showers and eyewashes will be provided adjacent to or in the area of all chemical storage and use areas. Appropriate PPE will be supplied to the plant personnel for use during any chemical spill containment and cleanup activities. Personnel will be properly trained in the handling of these chemicals and wastes and instructed in the procedures to follow in case of a chemical spill or accidental release. Adequate supplies of absorbent material will be stored on-site for spill cleanup.

## 1.4 OTHER FEDERAL, STATE, AND LOCAL AGENCY PERMITS REQUIRED

### 1.4.1 Identify Required Permits (Entire Project Area on Both Federal and Non-Federal Lands)

Table 1-6 below provides a summary of approvals and permits required or potentially required for the MSEP and provides the estimated date that it is anticipated that the approvals will be received.

**Table 1-6 Summary of Environmental Approvals/Permits Required or Potentially Required for the McCoy Solar Energy Project**

| Activity | Estimated Completion Date |
|---|---|
| No Jurisdiction Letter from USACE | September 2011 |
| U.S. Fish and Wildlife Service (USFWS) Biological Opinion | March 2012 |
| BLM ROD | October 2012 |
| BLM NTP | November 2012 |
| Riverside County Conditional Use Permit | November 2012 |
| RWQCB Discharge Permit if Required | November 2012 |
| Riverside County Approval to Use ROW | November 2012 |
| California Department of Fish and Game (CDFG) 2081 Permit | November 2012 |
| CDFG Streambed Alteration Agreement | November 2012 |

## 1.5 FINANCIAL AND TECHNICAL CAPABILITY OF APPLICANT

McCoy Solar, LLC is the legal entity developing the MSEP. McCoy Solar, LLC is a subsidiary of NextEra Energy Resources, LLC, which is the developer and owner of approximately 20,000 MW of renewable energy plants. NextEra Energy Resources, LLC owns, develops, constructs, manages, and operates domestic electric-generating facilities that sell power in wholesale energy markets.

NextEra Energy Resources, LLC is a wholly-owned subsidiary of NextEra Energy Capital Holdings, Inc., which holds the Capital stock and provides funding for the NextEra Energy, Inc. operating subsidiaries other than Florida Power & Light Company. NextEra Energy Capital

Holdings, Inc. is a holding company that derives substantially all of its income from its subsidiaries.

NextEra Energy, Inc. is the corporate parent and a public holding company incorporated in 1984 in Florida. NextEra Energy, Inc.'s principal subsidiary is Florida Power & Light, which is engaged in the generation, transmission, distribution, and sale of electric energy within the State of Florida.

NextEra Energy, Inc. is a leading clean energy company:

- NextEra Energy, Inc. 2009 revenues totaled more than $15 billion.
- NextEra Energy, Inc. operates nearly 43,000 MW of generating capacity.
- NextEra Energy, Inc. has more than 15,000 employees in 27 states and Canada.

NextEra Energy, Inc. has two principal subsidiaries:

- NextEra Energy Resources, LLC is the largest generator in North America of renewable energy from the wind and sun.
- Florida Power & Light Company serves approximately 4.5 million customer accounts in Florida and is one of the largest rate-regulated electric utilities in the country.

# 2.0 CONSTRUCTION OF FACILITIES

## 2.1 SOLAR FIELD DESIGN, LAYOUT, INSTALLATION, AND CONSTRUCTION PROCESSES INCLUDING TIMETABLE AND SEQUENCE OF CONSTRUCTION

### 2.1.1 Solar Field Design

The final design of the module arrangements are not yet complete, but based on the preliminary design, the PV module rows will be oriented north-to-south and track the sun from east-to-west. Module layout and spacing is typically optimized to balance energy production versus peak capacity, and depends on the sun angles and shading due to the surrounding horizon of the MSEP site. The modules will be mounted with the longer side oriented east to west (landscape orientation) across the tracker system's north-south axis. Individual arrays of modules (nominal 2 MW each) will be combined to generate the total capacity for each unit.

Although the specific equipment has not been selected, the solar arrays are anticipated to use a typical field control system. The controls generally provide a field supervisory controller located in a central location and local microprocessor controllers connected to each tracker. The field control system monitors solar insolation, wind velocity, and tracker performance and status, and communicates with all of the local microprocessor controllers. When the appropriate conditions exist, the field supervisory controller initiates the commands to initiate the trackers' daily tracking of the sun, and at the end of the day stows the trackers in the solar array. If major alarm conditions occur during operation, the control systems automatically take action to protect the solar field equipment.

### 2.1.2 Solar Field Layout

The solar field layout incorporates the north-south orientation of the trackers and the required tracker spacing to optimize the energy production for the Project. In addition, the spacing and orientation of the trackers provides sufficient room to reach the tracker and modules mounted on the tracker to perform maintenance or wash the modules. The preliminary layout of the arrays is shown on Figure 1-5.

### 2.1.3 Construction Approach and Sequence of Construction

The engineering, procurement, and construction of the MSEP units may be performed under multiple subcontracts with the Applicant. Major component suppliers (i.e., an inverter supplier, a PV module supplier, a tracker system supplier) and contractors for the balance of the system, gen-tie construction, and the interconnection facilities at the 230 kV switchyard/CRS tie-in may be contracted under separate mechanisms. This contract structure has been used on other solar PV energy projects.

On-site construction of the PV arrays, collection system, and the Project substation is anticipated to be performed under a balance of the system contract with a contractor that is experienced in constructing PV projects and substations. Construction of the gen-tie will be handled under a separate contract by a contractor experienced in building gen-tie and transmission lines.

The Project construction will be undertaken in a sequential approach in accordance with a Construction Plan, which will be developed prior to the start of construction in conjunction with

the selected contractors. The Construction Plan is anticipated to include approved documents developed during the detailed design stages, and other details. The approved documents may include design documents, work plan, health and safety plans, permits, Project schedule, and O&M manuals. In addition, other guidance documents and training may be developed and provided by the Applicant or subcontractors:

- Environmental health and safety training
- Site security measures
- Site first aid training
- Construction testing (non-destructive examination, hydro, etc.) requirements
- Site fire protection and extinguisher maintenance, guidance, and documentation
- Furnishing and servicing of sanitary facilities records
- Trash collection and disposal schedule/records
- Disposal of hazardous materials and waste guidance in accordance with local, state, and federal regulations

### 2.1.4 Project Schedule

The MSEP schedule is described in Section 1.1.2 of this POD, and in Table 2-1 below.

Construction of Unit 1 is scheduled to begin in May of 2013 following the receipt of the NTP and clearing the site for sensitive biological species, as shown below. Construction of Unit 2 will begin in Spring 2015 to meet the desert tortoise clearance windows. Commercial operation of Unit 2 is anticipated in December 2016.

**Table 2-1 Preliminary Construction Schedule**

| Activity | Date |
|---|---|
| Notice to Proceed | December 2012 |
| Tortoise Fencing/Clearance Surveys – Unit 1 | March – April 2013 |
| Start of Construction – Unit 1 | May 2013 |
| Initial Synchronization to CRS – Unit 1 | November 2013 |
| Tortoise Fencing/Clearance Surveys – Unit 2 | March – April 2015 |
| COD – Unit 1 | April 2015 |
| Initial Synchronization to CRS – Unit 2 | July 2015 |
| COD – Unit 2 | December 2016 |

## 2.2 PHASED PROJECTS, APPROACH TO CONSTRUCTION AND OPERATION

The Project will consist of two units, constructed sequentially, as shown in Table 2-1. Unit 1, the initial 250 MW, is estimated to be completed in July 2014. Unit 2, which will bring the total capacity up to 750 MW, is anticipated to be constructed and in operation by December 2016.

## 2.3 ACCESS AND TRANSPORTATION SYSTEM, COMPONENT DELIVERY, AND WORKER ACCESS

### 2.3.1 Access to the Facility

As discussed in Section 1.3.1, the Project can be accessed from I-10 at the Mesa Drive/Airport exit by heading west onto Black Rock Road. Approximately 1.5 miles west of Mesa Drive along Black Rock Road, the improved access road to the BSPP extends north towards the Solar Plant Site. MSEP will use this same access road up to the southern boundary of the BSPP, after which an improved access road will be constructed around the eastern side of the BSPP (see Figure 1-2).

This route, with the improved access road along the gen-tie, will be used by the construction contractor's workforce to reach the MSEP site. This access will also be designed to meet the Riverside County Fire Department requirements.

A controlled access gate will be located at the entrance to the facility. The main site gate will likely be either a motor-operated swing or a rolling-type security access gate. Access through the main gate will be controlled during construction and operations to prevent unauthorized access to the Solar Plant Site. All facility personnel, contractors, and visitors will be logged in and out of the facility by security personnel. A Fire Department Lock Box will be provided at the gate to provide emergency access.

### 2.3.2 Transportation/Delivery of Construction Equipment, Power Plant Components, and Materials to the Facility

The construction team will mobilize as soon as possible after receiving a NTP. As the site work is progressing, equipment and materials will start arriving at the site and will be staged by the order of installation. Construction materials such as fencing, gates, concrete, pipe, wire and cable, fuels, reinforcing steel, building components, and small tools and consumables will be delivered to the MSEP site by truck. The equipment for the MSEP, including the PV modules, tracker assemblies, electrical cables and wires, and other systems will also be delivered by truck. The only pieces of equipment that are anticipated to require heavy haul (oversize) transport and likely to require transportation permits are the main transformers.

The main access route to the Project will be I-10, regardless of whether the materials are coming from the east or west. Construction equipment, supplies, and other deliveries will likely be transported to the Solar Plant Site by the same access described above. During the construction portion of the work, a construction laydown area will be located within the eastern portion of the Solar Plant Site.

Delivery of construction equipment and Project components will be coordinated with local agencies to ensure compliance with California Department of Transportation (Caltrans), Riverside County, and BLM requirements. Weight and height restrictions will be verified and any required permits will be obtained by the delivery service.

The MSEP will implement the following measures:

- Develop and implement a Traffic Control Plan.
- Verify compliance with Caltrans, Riverside County, and BLM regarding limits on vehicle sizes and weights. In addition, the Applicant or its contractor will obtain necessary transportation permits from Caltrans and all relevant jurisdictions for roadway use.

- Obtain encroachment permits for the various public ROWs from Caltrans and all relevant jurisdictions.
- Ensure that all federal (Department of Transportation) and State regulations for the transport of hazardous materials are observed and all necessary permits acquired during both construction and operation of the facility.

Hazardous materials may be delivered periodically to the Project. Transportation of hazardous materials will comply with all Department of Transportation, USEPA, California DTSC, California Highway Patrol, and the California State Fire Marshal regulations for the transportation of hazardous materials.

The California Highway Patrol has authority over the transportation of hazardous materials in California and can issue permits and specify the route for delivery of certain hazardous materials. The Applicant will comply with these regulations.

## 2.4 CONSTRUCTION WORKFORCE NUMBERS, VEHICLES, EQUIPMENT, AND TIMEFRAMES

Mobile trailers or similar suitable facilities (for example, modular offices) will be used as construction offices for MSEP and contractor personnel. Construction laydown and parking areas will be within the overall Project site and their locations will be determined by the engineering design.

The on-site workforce will consist of laborers, craftsmen, supervisory personnel, support personnel, and construction management personnel. The on-site workforce is expected to reach its peak of approximately 600 individuals. As experience has shown, special circumstances may arise that warrant an increased number of on-site workers (up to 750 individuals) for a short period of time, which is typically a few weeks. There will be an average workforce of approximately 425 construction, supervisory, support, and construction management personnel on-site during construction.

Construction is also estimated to generate an average of approximately 40 to 80 one-way truck trips per day with a peak of approximately 80 to 120 truck trips per day. The peak truck travel will be during the delivery of the modules, trackers, and cabling, and the placement of concrete during plant foundation construction. Truck deliveries will not interfere with the peak on-site worker commute time frame.

Construction will generally occur between 7 a.m. and 7 p.m., Monday through Friday. Additional hours may be necessary to make up schedule deficiencies or to complete critical construction activities. For instance, during placement of concrete, or during hot weather, it may be necessary to start work earlier to avoid some activities during high ambient temperatures. During the startup phase of the Project, some activities may continue 24 hours per day, 7 days per week, such as equipment and system testing.

During construction, temporary utilities will be provided for the construction offices, laydown area, and the Project site. Temporary construction power during the construction period will be supplied via a distribution line to be built by SCE from either the south or east direction of the Solar Plant Site. The routing of the power to the Solar Plant Site is under analysis by SCE, but a proposed distribution line route is shown on Figure 1-2. Additional information on the distribution line is included in Section 3.3.2. Local construction power in the solar fields is anticipated to be provided by portable generators.

Area lighting will be strategically located for safety and security to minimize the light extending beyond the facilities.

## 2.5 SITE PREPARATION

Prior to any construction, all Project personnel will be trained on the implementation of environmental mitigation measures appropriate to their jobs before becoming involved with construction activities.

All employees and contractors working in the field will be required to complete an environmental training session before beginning work. The program will include discussions on the biology, distribution, and ecology of any special-status species within the general area of construction. It will also cover protection of those species under applicable federal and state law and regulations. It will go over all protection measures that must be followed to protect special-status species during Project activities, penalties for noncompliance, reporting requirements, and the importance of compliance with all protection measures.

Various mitigation measures call for pre-construction surveys. These surveys will be completed and reported prior to beginning construction in a particular area. The biologist making the survey will file the results electronically in a standard report format. This report will be sent electronically or by fax directly to the agencies requesting it and to the Environmental Supervisor, who will enter the report into the database for the MSEP.

### 2.5.1 Site Preparation: Surveying and Staking

Prior to the commencement of construction, the land surveyor will obtain or calculate benchmark data, grades, and alignment from plan information and provide control staking to establish the alignments, benchmarks, and elevations. The detailed design documents will furnish data for the horizontal and vertical control points and horizontal alignments, profiles, and elevations. During construction, the surveyor will re-establish and set additional control points to maintain the horizontal and vertical control points as needed.

Surveying and staking of environmental resources will also occur during construction as necessary. These are described in Sections 2.5.2 and Section 5.1.2.

### 2.5.2 Site Preparation: Vegetation Removal and Treatment

Prior to commencement of construction activities, the Applicant will identify areas that require protection to sensitive resources within the site, which will be identified by a variety of methods including flagging, marking paint, signs, rope, or staking. Where not otherwise specified, a suitable method for mitigation and/or removal and relocation of the biologically sensitive resource will be selected by the biologist assigned to the Project.

## 2.6 SITE CLEARING, GRADING, AND EXCAVATION

The Site Supervisor will typically maintain a Pre-Construction Clearance Checklist. The purpose of the checklist is to document that all pre-activities such as signage and flagging, notification, or other required activities are in place and that written authorization to proceed has been received from the Applicant. The checklist will identify the areas planned for construction. Once the checklist is completed, it will be issued to a pre-established distribution list.

Prior to initiation of grading operations, and once Pre-Construction Clearance has been granted, the construction areas will be cleared and grubbed of vegetation and miscellaneous debris. All vegetation and debris will be stockpiled and then properly disposed of off-site. The primary grading activities will be associated with the main access road and the gen-tie, with lesser quantities associated with facility buildings, parking areas, internal access roads, Project substation, and the associated foundations.

For these areas, grading will consist of the excavation and compaction of earth to meet the requirements identified during the detailed design. Limited grading is anticipated for the trackers, so long as the solar field area does not contain deep gullies or channels.

The preliminary grading on-site is designed to ensure the Project substation and O&M Building are protected in the 100-year storm event, and to maintain the post development at approximately pre-development conditions.

Materials suitable for compaction will be stored in stockpiles at designated locations using proper erosion prevention methods. Materials unsuitable for compaction, such as debris and large rocks, will be stockpiled at designated locations for subsequent disposal at an acceptable off-site location. Contaminated materials are not anticipated, but if any are encountered during excavation, they will be disposed of in accordance with applicable laws, ordinances, regulations, and standards.

The areas of the existing Solar Plant Site that will be graded are expected to result in a balanced cut and fill quantity of earthwork to maintain the existing conditions to the extent practical for the protection of the equipment and facilities.

## 2.7 SOLAR ARRAY ASSEMBLY AND CONSTRUCTION

Construction of the tracker assemblies may be conducted in a temporary building on-site and then transported to the proper location and placed on the pre-installed supports. Alternately, the array assembly may occur adjacent to the installation point. Final assembly typically involves small cranes, tractors, welding machines, and forklifts to place the trackers onto the support structures. During this work, there will be multiple crews working the site with vehicles, including special vehicles for transporting the arrays.

Depending on the final PV technology and vendor selected, the design of the tracker support structures may vary somewhat. The typical installations of this type may be constructed using concrete foundations, driven steel piles, or grouted steel piles. Final construction and installation details that will be required for the construction will be determined in the final design.

As the solar arrays are installed the balance of the plant will continue to be constructed and installed and the electrical power and instrumentation will be placed. Within the solar fields, the electrical and instrumentation/control wiring will be installed in trenches underground. The wiring will be run to the location of the solar field controls and the circuits will be checked.

## 2.8 SOLAR POWER PLANT CONSTRUCTION

Due to the level of effort required for the electrical substation, the construction will begin almost immediately. Heavy foundations and equipment pads must be constructed for these components, requiring trenching machines, compactors, concrete trucks and pumpers, vibrators, forklifts, boom trucks, and large cranes. The O&M Building foundation and framework for the buildings will be placed as the construction progresses.

Once the majority of the components have been placed on their respective foundations, the electricians and instrumentation installers will run the electrical cabling throughout the solar field.

After the equipment is connected, electrical service will be verified, motors checked, and control logic verified. The various hydraulic systems will likely be charged with their appropriate fluids and go through individual startup testing. Once all of the individual systems have been tested, the overall MSEP will be ready to be tested under fully integrated conditions.

## 2.9 GRAVEL AGGREGATE, CONCRETE NEEDS, AND SOURCES

The quantities of construction materials required for the Project, such as gravel, aggregate (or road base), asphalt and concrete, are dependent on the final arrangements and layouts. These layouts will be part of the detailed design, and the material takeoffs will be estimated at that stage in the Project.

Preliminary studies indicate that the nearest processing plant for these materials may be in Ehrenburg, Arizona, with another source located in Indio, California. Transportation fees associated with delivery of these materials must be considered, and alternative sources will be explored as further studies are conducted and construction needs become known. Due to the quantities and distances required for hauling the materials, it is possible that a batch plant will be set up on the site, but this will not be determined until the detailed design identifies the materials and estimated quantities required.

## 2.10 ELECTRICAL CONSTRUCTION ACTIVITIES

Electric service during the construction period will be supplied via a distribution line to be built by SCE from either the south or east direction of the Solar Plant Site. The routing of the distribution line is under analysis by SCE.

## 2.11 AVIATION LIGHTING (POWER TOWERS, TRANSMISSION)

The Project is located approximately 4 miles northwest of the Blythe Airport, which is an active Riverside County airport. The PV arrays should not pose an aviation problem and no building or equipment will be taller than about two stories.

There will be a number of transmission line towers associated with the Project substation and the gen-tie. The proposed gen-tie will be located between 1.5 and 2 miles from the airport. It is anticipated that the monopoles used in the gen-tie line will be sufficiently low height so that the MSEP meets the height restrictions in the area of concern near the airport. The monopoles will in general follow the height of the BSPP monopoles. The MSEP will submit a “Notice of Proposed Construction and Alteration” (Form 7460) to the Federal Aviation Administration consistent with the advance notice requirement contained in Federal Aviation Administration regulations.

## 2.12 SITE STABILIZATION, PROTECTION, AND RECLAMATION PRACTICES

The Applicant will develop more details pertaining to this area as the design of the MSEP is completed.

## 2.13 ENGINEERING AND CIVIL DESIGN (SUPPLEMENTAL INFORMATION)

### 2.13.1 Facility Survey and Design Standards

The standards for conducting land and more detailed topographic surveys will be defined prior to conducting any surveys, and such surveys will be conducted in accordance with State and federal laws and regulations.

The preliminary design presented in this POD is based on topographic data obtained from both the USGS topographic map and more recent digital terrain data collected during 2005 using airborne Interferometric Synthetic Aperture Radar and processed by Intermap Technologies, Inc. This digital data has improved the topographic resolution for site features, as well as providing a more recent overview of the MSEP site. Additional still higher resolution topographic data will be developed for the detailed design effort. This effort, which will include both land and aerial surveys, will be described in the design basis document.

The design and construction of the MSEP will be in accordance with the latest edition of the CBC. Additional design standards for civil engineering, mechanical engineering, electrical and control engineering, geologic/foundation designs, and structural engineering will be identified in a design basis document prior to the start of the detailed design and identified in this POD at that time.

Crossings of the BSPP gen-tie and I-10 will be designed in accordance with the most current revision of the Institute of Electrical and Electronics Engineers National Electric Safety Code and the California Public Utilities Commission's Rules for Overhead Line Construction, GO-95.

### 2.13.2 Final Engineering and Civil Design Package for All Solar Facilities, Power Conversion Facilities, and Ancillary Facilities That Incorporate All Mitigation Measures Developed in the NEPA Analysis and Incorporated into the Final POD

The details of mitigation measures that will be implemented will be developed for this Project and incorporated into this document and the detailed design package, which will be developed as the Project proceeds.

### 2.13.3 Watershed and Drainage Analysis and Calculations

A preliminary hydrology/hydraulic assessment was performed to evaluate hydrologic conditions in the vicinity of the proposed Solar Plant Site (AECOM 2011a, Appendix A). The analysis was performed using the currently available information, including the USGS topographic data and Digital Terrain Model data, to provide information concerning the existing hydrologic conditions. The existing drainage at the location of the Solar Plant Site is from the McCoy Mountains west of the site, and the topographic contours indicate that the storm water originating near the southwestern edge of the McCoy Mountains fans out towards the eastern and the southern half of the Solar Plant Site. The hydrologic evaluation was based on the guidance provided in the Riverside County Flood Control and Water Conservation District (RCFC&WCD) Hydrology Manual (Riverside County 1978) and regional USGS regression equations.

The preliminary assessment summary of the run-on drainage pattern and existing hydrology with 100-year storm event peak flow is shown in the Pre- and Post-Development Hydrology Report (AECOM 2011a).

The watershed and drainage analysis will be updated as part of final design. Additional information is included in Section 6.0.

### 2.13.4 Watershed Protection and Erosion Control Design Drawings

The Solar Plant Site's preliminary storm water drainage has been evaluated; details of site hydrology can be found in the Pre- and Post-Development Hydrology Report (AECOM 2011a; Appendix A). The preliminary design employed for the layout of the solar arrays is to minimize placement of the 2 MW arrays in large, established channels (to the extent practical) and utilize equipment and protective measures that will allow the existing drainage patterns to be maintained where possible.

The placement of the 2-MW solar arrays will be evaluated to avoid areas with significant existing drainage channels where possible, and to evaluate the need for additional structural support measures where the trackers may cross smaller channels. On-site run-on to the solar fields follows natural grade, generally from the mountains to the southwest in a southeastern direction. Minimal grading is anticipated within the solar field, primarily to allow access to the solar arrays.

### 2.13.5 Final Site Grading Plans

The natural slope within the Project site is approximately 1 percent or less. The use of tracker technology allows the existing topography to be essentially left in the existing condition by adjusting the height of the supports to level the PV modules. Localized grading will be performed in areas where there are gullies or sections that are otherwise impassable by vehicles.

The final grading details as well as the grading for the Project substation, O&M Building, and water treatment area will be developed once the final, updated survey data is available in the final design.

# 3.0 RELATED FACILITIES AND SYSTEMS

## 3.1 TRANSMISSION SYSTEM INTERCONNECT

### 3.1.1 Proposed Transmission System, Ancillary Facilities, and Substations

The electrical power generated by the MSEP will be transmitted from the MSEP substation to SCE's proposed CRS through an approximately 14.5 mile long proposed gen-tie corridor. The proposed gen-tie will be routed south from the Solar Plant Site, around the east side of the BSPP, south across I-10, and then west to the proposed CRS (see Figure 1-2).

**MSEP Substation:** The power from both of the units will be routed to the new MSEP substation. The substation will have two collocated parallel systems, one per unit, each of which are estimated to require a footprint of approximately 500 feet by 600 feet.

The Project substation will be located on the northeast side of the Solar Plant Site as shown in Figure 1-5. The 34.5 kV to 230 kV Project substation is anticipated to include sets of internal power distribution systems containing 34.5 kV buses and circuit breakers, disconnect switches, and main step-up transformers to increase the incoming 34.5 kV to the transmission line voltage of 230 kV.

Shield wires and lightning arrestors will be included to protect substation equipment and personnel against lightning strikes.

**Gen-tie:** The two units from MSEP will interconnect to SCE's proposed CRS through the proposed approximately 14.5 mile long gen-tie corridor that uses a single set of support towers to support a separate gen-tie circuit for each unit. The proposed gen-tie from the Project substation will be routed south from the Solar Plant Site, around the east side of the proposed BSPP, south across I-10, and then west to the location of the proposed SCE CRS. As shown on Figure 1-2, nearly half of the proposed gen-tie route is parallel to the BSPP gen-tie. For that portion of the route, the MSEP gen-tie lines would be located approximately 50 to 100 feet from the BSPP gen-tie.

The gen-tie monopole support structures will be designed for double circuit use, with the first circuit (i.e., the conductors from Unit 1) being hung during the gen-tie construction. The Unit 1 circuit will connect to the electrical grid through a 230 kV switchyard that is subsequently connected to SCE's proposed CRS. The switchyard will be located in the vicinity of SCE's CRS, as shown on Figure 1-2.

As part of the construction for Unit 2, the second circuit (i.e., the conductors from Unit 2) will be added to the existing MSEP gen-tie towers and follow the same gen-tie corridor from the Project substation to the proposed SCE CRS. The conductors from Unit 2 will be routed directly to the proposed CRS rather than to the switchyard.

The gen-tie support towers are estimated to be approximately 80 to 90 feet tall, depending on the location and local terrain, with final heights as determined during detailed design. The towers will be reinforced as necessary to withstand design loads. The lines will be insulated from the poles using porcelain insulators engineered for safe and reliable operation. Shield wires will be included along the length of the lines to protect against lightning strikes.

The final transmission tower design including tangent, angle, dead end, and pull-off structures and associated hardware will be determined during the final engineering of the proposed interconnection.

The primary telecommunication line will be hung from the top of the gen-tie support towers.

### 3.1.2 Status of Power Purchase Agreements

McCoy Solar is pursuing a Power Purchase Agreement (PPA) for the full output from the Project. McCoy Solar expects the term of the PPA will be 20 years from the MSEP commercial operations date.

### 3.1.3 Status of Interconnect Agreement

McCoy Solar is in the process of securing a Large Generator Interconnect Agreement (LGIA) with SCE to connect to the new CRS.

The LGIA is an agreement between the project proponent, SCE, and the California Independent System Operator (CAISO). This LGIA will become effective upon execution by all parties subject to acceptance by the Federal Energy Regulatory Commission or, if filed unexecuted, upon the date specified by Federal Energy Regulatory Commission. The term of the LGIA is expected to be for a period of 30 years from the effective date with automatic successive 1-year period renewals thereafter.

The LGIA enables the facility to connect to SCE's transmission system and to be eligible to deliver the large generating facility's output using the available capacity of CAISO's controlled grid. In the event of transmission constraints on the CAISO controlled grid, the facility will be subject to the applicable congestion management procedures in the CAISO Tariff in the same manner as all other resources.

### 3.1.4 General Design and Construction Standards

The gen-tie lines will be constructed for operation at 230 kV, the nominal operating voltage of the regional transmission system. The use of 230 kV as the targeted design voltage is consistent with the industry use of the 230-kV term to describe the nominal voltage for this class of system. A single set of monopole structures, designed for double circuit use, will support the gen-ties for both units. The towers are anticipated to be spaced at approximately 800 feet intervals with final spacing and heights as determined during detailed design. The lines will be insulated from the towers using porcelain insulators engineered for safe and reliable operation. Shield wires will be included along the length of the lines to protect against lightning strikes. The tower designs will be engineered to provide design limits for purposes of the electric and magnetic field studies and in accordance with the current standards. Final transmission structure design including tangent, angle, dead end, and pull-off structures and associated hardware will be determined during the final engineering of the proposed interconnection.

#### Construction Standards and Details

The gen-tie will be constructed with crews working continuously along the route, with construction of the towers and first circuit (i.e., Unit 1 conductors) for the gen-tie requiring a peak workforce of approximately 34 workers. Gen-tie construction will include the following activities:

- Preparation of marshalling yards

- Access road and spur road construction
- Clearing and grading of pole sites
- Foundation preparation and installation of poles
- Conductor installation
- Cleanup and site reclamation

Various construction activities will occur during the construction process with several construction crews operating simultaneously at different locations. The following subsections describe in more detail the construction activities associated with the Project gen-tie.

**Marshalling Yards:** Construction staging/laydown and parking areas are proposed within the MSEP site and at a location to be designated once the gen-tie route is finalized. Construction materials such as concrete, wire and cable, fuels, and small tools and consumables will be delivered to the staging/laydown areas by truck. Mobile trailers or similar suitable facilities (for example, modular offices) will be used for construction offices to be located at the MSEP staging/laydown areas.

**Road Work:** The construction, operation, and maintenance of the proposed gen-tie will require that heavy vehicles access the tower sites along the road. The MSEP proposes to use existing or newly constructed site access roads for all construction, operation, and maintenance activities associated with the gen-tie. If required, new spur roads, approximately 14 feet wide and averaging 25 to 50 feet in length, will be constructed from the access roads to the tower sites. Each spur road will lead to a construction pad for a tower structure.

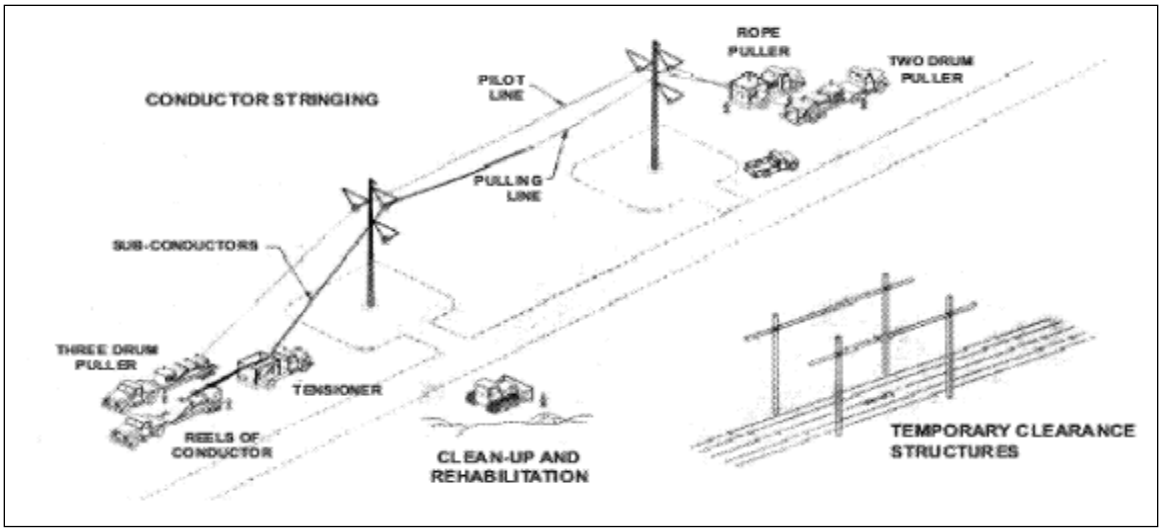
**Pole Pads:** At each site, a work area will be required for the tower footing location, structure assembly, and the necessary crane maneuvers. The work area will be cleared of vegetation only to the extent necessary and the construction pad will be leveled to facilitate the safe operation of equipment such as construction cranes.

**Pole Erection:** Gen-tie tower foundation excavations will be made with power drilling equipment. A vehicle-mounted power auger or backhoe will be used to excavate for the structure foundation. Although not expected, in some instances blasting could be necessary because of specific geologic conditions. In the unlikely event blasting is necessary, conventional or plastic explosives will be used. Safeguards (e.g., blasting mats) will be employed when adjacent areas require protection. (Additional details concerning blasting are included in Section 5.7.9.)

Installation of new steel or concrete tower structures to support the 230 kV circuit will begin with the excavation of foundations approximately 6 feet in diameter and 20 feet in depth. A truck-mounted auger, backhoe, or similar equipment will typically be used for excavation of this type. Once the foundation holes have been cleaned, the towers with preassembled insulators, hardware, and stringing sheaves will be lifted into position, inserted into the foundation holes, and gravel or concrete will be poured in to backfill the hole and create a foundation. Erecting each tower structure takes approximately 2 to 3 hours.

**Conductor Installation:** Typical conductor stringing activities are illustrated below. For public and existing line protection during wire installation, crossing structures will be erected adjacent to structures requiring protection during conductor installation. Crossing structures will consist of H-frame wood poles placed on either side of an obstacle. These structures will prevent ground wire, conductors, or equipment from falling on an obstacle and will be removed following the

completion of conductor installation. Equipment for erecting the crossing structures will be the same as the equipment discussed above for gen-tie tower installation. Crossing structures may not be required for small roads or other areas where suitable safety measures such as barriers, flagmen, or other traffic controls could be used.




Conductor Stringing Activities

Pilot lines will be pulled (strung) from structure to structure and threaded through the stringing sheaves at each structure. This phase of work may be accomplished through the use of helicopters to minimize or otherwise eliminate the need to traverse along the ground from structure to structure. Following the pilot lines, a larger diameter stronger line will be attached to the conductors to pull them onto the structures. This process will be repeated until the ground wire or conductor is pulled through all sheaves. During the Unit 2 construction, the second circuit (i.e., set of conductors) for Unit 2 will be strung on the towers that were installed for the Unit 1 gen-tie.

**Pulling Sites:** The shield wire and conductors will be strung using powered pulling equipment at one end and powered braking or tensioning equipment at the other end, approximately 1 mile apart. Tensioners and/or pullers, line trucks, wire trailers, and tractors needed for stringing and anchoring ground wire or conductor will be necessary at each pulling site. The tensioner, in concert with the puller, will maintain tension on the shield wires or conductors while they are pulled through the structures. There will be approximately 25 pulling sites required to install the conductors along this segment of the gen-tie. The sites will be accessed from the Project access roads.

**Clean Up and Site Reclamation:** Construction sites, material storage yards, and access roads will be kept in an orderly condition throughout the construction period. Approved enclosed refuse containers will be used throughout the MSEP. Refuse and trash will be removed from the sites and disposed in an approved manner. Oils or chemicals will be hauled to a disposal facility authorized to accept such materials. Open burning of construction trash will not be acceptable.

Disturbance will be carefully planned and minimized during construction. The post-construction ROW will be restored as required by the BLM and the site restoration plans. See Section 5.8.1.

## 3.2 GAS SUPPLY SYSTEMS

No natural gas is required for the PV technology.

## 3.3 OTHER RELATED SYSTEMS

### 3.3.1 Communications System Requirements (Microwave, Fiber Optics, Hard Wire, Wireless) During Construction and Operation

Communications during the construction phase will typically be made using cellular telephones and two-way, handheld radios. Emergency communications during construction activities may be made using air horns in addition to the radios or cellular telephones.

Communication requirements during the MSEP operations will be assessed and included in the detailed design and plans for the facility.

The facility will utilize a SCADA system for remote control and monitoring of inverters and other equipment. Details of the SCADA system are still preliminary; however, the use of a software such as Wonderware's human machine interface/SCADA software is anticipated.

New telecommunications lines will connect the Project substation with the electrical grid through SCE's proposed CRS. These telecommunication lines are generally fiber optic lines that are capable of carrying large quantities of data at high transmission speeds. As required for connection and interaction with the electrical grid, there will be two independent telecommunication lines provided. The primary telecommunication line will be hung at the top of the gen-tie support towers and the secondary telecommunication line will be located within the disturbance area of the access or maintenance roads. These telecommunication lines will be installed as part of the gen-tie construction for Unit 1.

### 3.3.2 Distribution Line for Low Voltage Electrical Power

Power during the construction period will be supplied via a distribution line to be built by SCE from either the south or east direction of the Solar Plant Site.

This distribution power circuit may be utilized to provide the low voltage supply for operating the tracker motors, various monitoring instruments, computer, access gates, and other low voltage equipment.

The exact routing of the distribution line to the Solar Plant Site will be finalized in consultation with SCE, but a proposed potential route is shown on Figure 1-2.

# 4.0 OPERATIONS AND MAINTENANCE

## 4.1 O&M FACILITIES

There will be an approximately 3,000 square foot O&M Building for the Project. The building will meet Riverside County design standards. The O&M Building will be designed to accommodate various functions required to run the facility including general office space and conference rooms, administrative and engineering functions, equipment and spare parts storage, and other O&M functions.

The facility will utilize a SCADA system for remote control and monitoring of inverters and other equipment. Wonderware's human machine interface/SCADA software is anticipated to be specified.

## 4.2 MAINTENANCE ACTIVITIES, INCLUDING MIRROR WASHING AND ROAD MAINTENANCE

The operation and maintenance of a PV solar power generating project requires staff as a result of the large amount of equipment utilized in a solar power plant.

The performance of the solar field is directly influenced by the optical transmittance of the flat-panel surface material. Optical transmittance of the panel surface material is decreased by soiling from airborne contaminants. A number of factors can impact the soiling rate of the panel surface, and hence the performance of the solar field. These include:

- Season
- Frequency of rainfall
- Proximity of arrays to roads or other sources of airborne particulates

### 4.2.1 Solar Panel Washing

The PV surface panels are to be washed regularly to increase the average optical transmittance of the flat panel surface. Panel washes are likely to occur in the fall and spring and will take approximately 70 days to complete per wash. It is estimated that panel washes will take approximately 140 to 145 days per year to complete.

The demand for water to wash the panels is approximately 60,000 gallons per day (gpd). Potable water required for up to 13 to 20 on-site staff members is approximately 6,000 to 10,000 gallons per month.

### 4.2.2 Road Maintenance

Design details for road construction methods are unavailable at this phase of the design process. The access road is discussed in Section 1.3.1 and elsewhere in this document. The Applicant currently plans to install an additional paved access road in conjunction with the gen-tie from the point where the gen-tie crosses the shared access road with BSPP to the Solar Plant Site (see Figure 1-2).

This route, with the improved access road along the gen-tie, will be used by the construction contractor's workforce to reach the Solar Plant Site. The paved road will be maintained as

required to preserve the asphalt surface from degradation. Potholes or damage to the road will be repaired as soon as practical.

Unpaved roads may be periodically sprayed for dust control and will be periodically cleared of rutting and erosion rivulets by a motor-grader.

## 4.3 OPERATIONS WORKFORCE AND EQUIPMENT

The MSEP may be staffed by a total of up to 13 to 20 operations personnel during the site's daytime working hours. Some operations personnel will be present 7 days per week to provide monitoring and support. The finalized operational and maintenance needs will be determined once the specific PV solar power equipment and design details are completed.

# 5.0 ENVIRONMENTAL CONSIDERATIONS

The following sections provide a summary of the important resources in the area and the mitigation measures that the Applicant anticipates including as part of the Project description. Implementation of proposed mitigation measures will ensure that potential adverse environmental impacts from construction and operation of the proposed Project are either avoided or minimized.

## 5.1 GENERAL DESCRIPTION OF SITE CHARACTERISTICS AND POTENTIAL ENVIRONMENTAL ISSUES (EXISTING INFORMATION)

### 5.1.1 Ecoregion and Vegetation

The MSEP site is located within the Sonoran Desert and is almost entirely Sonoran creosote bush scrub, as described by Holland (1986). The Sonoran creosote bush scrub community is characterized by widely spaced shrubs located on well-drained soils. Common species include creosote bush (*Larrea tridentata*) and burro bush (*Ambrosia dumosa*), with brittlebush (*Encelia farinose*), white rhatany (*Krameria grayi*), galleta grass (*Pleuraphis rigida*), and desert lavendar (*Hyptis emoryi*) also present. Palo verde (*Cercidium floridum*) and ironwood (*Olneya tesota*) are found in the ephemeral drainages. Desert pavement is a common feature on most of the Solar Plant Site, increasing in both area and particle size on the upper bajada of the southwestern portion of the Solar Plant Site. Closer to the mountains, cobbly, well-developed desert pavement, which contains very little vegetation, dominates the landscape.

The topography in the western portion of the Solar Plant Site is undulating (in the south) to very gently undulating (in the north) and intersected by several well-vegetated arboreal and shrubby drainages; several of these washes are well-incised, broad arroyos. Incised and un-incised, well-vegetated washes and runnels are numerous in the south-central portion of the Solar Plant Site. McCoy Wash is a broad wash system (desert dry wash woodland) that is located to the north and east of the Solar Plant Site.

A detailed description of vegetation communities and land cover can be found in the McCoy Solar Energy Project Biological Resources Technical Report (Tetra Tech and Karl 2011).

### 5.1.2 Survey Methods and Protocol for Special-Status Species

Development of the MSEP will affect vegetation, wildlife, and their habitats. A literature search, agency consultations, and comprehensive biological field surveys were performed to identify which special-status species and sensitive habitats occur within or adjacent to the Project area. The literature search involved accessing available databases (e.g., California Natural Diversity Database, Northern and Eastern Colorado Desert Coordinated Management [NECO] Plan [BLM 2002]) and other existing, available information sources. This information, as well as agency consultations, was used to develop a focused field survey using the appropriate, species-specific protocols. The biological surveys identified sensitive resources at and adjacent to the Project, and will assist in the development of measures to avoid, reduce, and mitigate potential impacts including, but not limited to, those identified below. The results of the surveys and agency consultation will determine the need to obtain additional permits (e.g., Incidental Take Statement) from the appropriate regulatory agencies.

In December of 2007, a preliminary reconnaissance survey was conducted of the originally requested ROW to identify vegetation communities as well as determine the likely flora and fauna occurring in the area. To further refine the vegetation and habitats present, additional field surveys were conducted in October 2010. Full biological surveys, including USFWS protocol desert tortoise surveys, of the Project area, were conducted in Spring 2011 (see Tetra Tech and Karl 2011).

### 5.1.3 Special or Sensitive Species and Habitats

Several species known to occur on or in the vicinity of the MSEP are accorded "special-status" by federal and state agencies because of their recognized rarity or potential vulnerability to extinction. These species typically have a limited geographic range and/or limited habitat and are referred to collectively as special-status species. Prior to field surveys, a target list of special-status species that might be affected by the Project was developed (Table 5-1) based on review of available literature and databases, and consulting with the agencies and local experts. Additional target species were added according to the NECO Plan (BLM 2002) for which surveys must be completed where a Project intersects the species' ranges, as mapped in the NECO Plan. Managed game species and burros (protected by the Wild, Free-Roaming Horse and Burro Act) were also included in the target list. Desert kit fox (*Vulpes macrotis*) is protected furbearer (CDFG Code 4000).

### 5.1.4 Special Management Areas

The MSEP is within the NECO planning area (BLM 2002), which provides for conservation and management of several special-status species, in large part through a system of broad management areas: Desert Wildlife Management Areas for desert tortoises, Multiple-Species Wildlife Habitat Management Areas for other special-status species and natural communities, and Areas of Critical Environmental Concern. The MSEP site is not within or near a designated Desert Wildlife Management Areas or Areas of Critical Environmental Concern; however, at the closest point, it is located approximately one-half mile from the boundary of a big horn sheep Wildlife Habitat Management Area (Figure 5-1). The proposed switchyard overlaps the Mule Mountains Area of Critical Environmental Concern.

## 5.2 SPECIAL LAND USE DESIGNATIONS

The MSEP site is currently located within lands managed by BLM and private lands (Figures 1-3 and 1-4). BLM's California Desert Conservation Area (CDCA) Plan (BLM 1999a) and its regional update, NECO (BLM 2002), indicate that there are no Wilderness Areas, Desert Wildlife Management Areas, or Wildlife Habitat Management Areas within or adjacent to the MSEP site. The switchyard overlaps the Mule Mountains Area of Critical Environmental Concern. The entire area is mapped in the NECO Plan as "Class L" or Limited Use. Class L lands are managed to provide for generally lower-intensity, carefully controlled multiple use of resources, while ensuring that sensitive values are not significantly diminished. According to the multiple use class guidelines, solar electrical generation facilities may be allowed in Class L after NEPA requirements are met (BLM 1999b). A CDCA Plan amendment will be necessary to allow the MSEP to be built in the area.

**Table 5-1 Special-status and Other Target Plant and Wildlife Species Observed and Potentially Occurring Within the McCoy Solar Energy Project Vicinity**

| Species | Status[1] | | | | Habitat | Likelihood of Occurrence on the Project Area[4] |
|---|---|---|---|---|---|---|
| | Federal | State | CNDDB Rank[2] | CNPS[3]/ Other | | |
| Plants | | | | | | |
| Abrams's Spurge (*Chamaesyce abramsiana*) | --- | --- | G4/S1.2 | 2 | Sandy sites in Mojavean and Sonoran Desert scrubs in eastern California; 0 to 3,000 feet | Possible; pending fall surveys[4] |
| Algodones Dunes Sunflower (*Helianthus niveus tephrodes)* | --- | E | G4T2/S1.2 | 1B | Desert dunes, especially Algodones Dunes | Unlikely; not observed |
| Angel Trumpets *(Acleisanthes longiflora)* | --- | --- | G5/S1 | 2 | Sonoran Desert Scrub (limestone); mountains or base of mountains, 0-8,202 feet | Highly unlikely due to lack of limestone and rocky habitat in Project Area; not observed |
| Darlington's Blazing Star *(Mentzelia puberula*) | --- | --- | G4/S2 | 2.2 | Rocky, generally mountainous sites from the Ord Mts. to northern Baja California | Highly unlikely due to lack of habitat; not observed |
| Arizona Cottontop *(Digitaria californica*) | --- | --- | G5/S1.3 | 2 | Rocky Sonoran and Mojavean Desert Scrubs; three consortium records in California; 950 to 4,900 feet | Unlikely due to rocky association; not observed |
| Arizona Spurge (*Chamaesyce arizonica*) | --- | --- | G5/S1.3 | 2 | Sandy flats in Sonoran Desert Scrub, below ~1,000 feet | Possible; pending fall surveys[4] |
| Ayenia (*Ayenia compacta*) | --- | --- | G4/S3? | 2 | Sandy and gravelly washes and canyons in desert scrubs, 450 to 6,000 feet | Possible; not observed |
| Bitter Hymenoxys *(Hymenoxys odorata)* | --- | --- | G5/S2 | 2 | Riparian scrub and Sonoran Desert Scrub, sandy flats near Colorado River, known only from the Colorado River alluvial plain, 150- 495 feet | Unlikely because of species association with the Colorado River floodplain; not observed |
| California Ditaxis (*Ditaxis serrata* var. *californica*) | --- | --- | G5T2T3/S2 | 3 | Sonoran Creosote Bush Scrub from 100 to 3,000 feet | Possible; not observed |
| California Satintail *(Imperata brevifolia*) | --- | --- | G2/S2.1 | 2 | Wet springs, meadows, and flood plains in Chaparral, Coastal Scrub, Mojavean Desert Scrub; 0 – 1,650 feet | Highly unlikely due to lack of habitat; not observed |
| Chaparral Sand Verbena (*Abronia villosa* var.*aurita*) | --- | --- | G5T3T4/S2 | 1B | Loose to aeolian sands; chaparral and coastal sage scrub; below 2,000 feet | Highly unlikely; not observed |
| Cove's Cassia (*Senna covesii)* | --- | --- | G5?/S1 | 2 | Dry washes and slopes in Sonoran Desert Scrub, 1,600 to 1,900 feet | Not present; not observed |
| Crown of Thorns *(Koeberlinia spinosa tenuispina*) | --- | --- | G4T4/S2.2 | 2 | Creosote Bush Scrub in Sonoran Desert; 500 to 1,700 feet | Not present; not observed |
| Crucifixion Thorn (*Castela emoryi*) | --- | --- | G2G3/S2S3 | 2 | Mojavean and Sonoran Desert Scrubs; typically associated with drainages | Not present; not observed |
| Desert Portulaca *(Portulaca halimoides)* | --- | --- | G5/S3 | 4 | Sandy areas and flats in Joshua tree woodland and desert mountains; 3,280-3,937 feet | Highly unlikely due to lack of habitat and elevational constraints; not observed |
| Desert Sand-parsley (*Ammoselinum giganteum*) | --- | --- | G2G3/SH | 2 | Sonoran Desert Scrub; known from one site near Hayfield Dry Lake at 1,200 feet | Highly unlikely; not observed |
| Desert Spike Moss (*Selaginella eremophila*) | --- | --- | G4/S2.2? | 2 | Shaded rocky habitats in the Sonoran Desert, to Arizona and northern Mexico; below 3,600 feet | Unlikely due to lack of habitat; not observed |

| Species | Status[1] | | | | Habitat | Likelihood of Occurrence on the Project Area[4] |
|---|---|---|---|---|---|---|
| | Federal | State | CNDDB Rank[2] | CNPS[3]/ Other | | |
| Desert Unicorn Plant (*Proboscidea althaeifolia*) | --- | --- | G5/S3.3 | 4 | Sandy areas in Sonoran Desert Scrub throughout southeastern California, below 3,300 feet. | Observed Fall 2010 and Spring 2011 |
| Dwarf Germander *(Teucrium cubense depressum)* | --- | --- | G4G5T3T4/ S2 | 2 | Sandy soils, washes, fields; below 1,300 feet | Possible; not observed |
| Flat-seeded Spurge (*Chamaesyce platysperma*) | BLM Sensitive | --- | G3/S1.2? | 1B | Sandy flats and dunes in Sonoran Desert Scrub; below 350 feet | Possible; not observed |
| Foxtail Cactus (*Coryphantha alversonii*) | --- | --- | G3/S3.2 | 4 | Primarily rocky substrates between 250 and 4,000 feet in Creosote Bush Scrub | Unlikely; not observed |
| Glandular Ditaxis (*Ditaxis claryana*) | --- | --- | G4G5/S1 | 2 | Sandy flats in Mojavean and Sonoran Creosote Bush Scrubs in Imperial, San Bernardino, and Riverside counties; below 1,500 feet | Possible; not observed |
| Graham's fishhook cactus (*Mammillaria grahamii* var. *grahamii)* | --- | --- | G4T4/S2 | 2 | Sandy or rocky canyons, washes in creosote bush scrub; 1,000-2,970 feet | Possible; not observed |
| Harwood's Milkvetch (*Astragalus insularis* var. *harwoodii*) | --- | --- | G5T3/S2.2? | 2 | Dunes and windblown sands below 1,200 feet, east and south of approximately Desert Center | Observed Spring 2011 |
| Harwood's Phlox (*Eriastrum harwoodii*) | --- | --- | G2/S2 | 1B | Desert dunes below 7,000 feet., eastern Riverside, San Bernardino and San Diego Counties | Observed Spring 2011 |
| Jackass Clover *(Wislizenia refracta* var. *refracta*) | — | — | G5T5?/S1.2? | 2 | Sandy washes, roadsides, flats; 1,900 to 2,700 feet | Possible; not observed |
| Las Animas Colubrina (*Colubrina californica*) | --- | --- | G4/S2S3.3 | 2 | Sonoran Desert Creosote Bush Scrub, < 3,300 feet | Observed Fall 2010 and Spring 2011 |
| Lobed Ground Cherry *(Physalis lobata)* | --- | --- | G5/S1.3? | 2 | Mojave Desert Scrub, playas, granitic soils, 1,640-2,625 feet | Unlikely. All known locations well to north of Project and at higher elevations. Not observed. |
| Mesquite Nest Straw (*Stylocline sonorensis*) | --- | --- | G3G5/SX | 1A | Open sandy drainages; known from one site near Hayfields Dry Lake | Highly unlikely; not observed |
| Mojave Fishhook Cactus *(Sclerocactus polyancistrus*) | --- | --- | G4/S3.2 | 4 | Mojavean Desert Scrub (Creosote Bush Scrub and Pinyon-Juniper Woodland, and Great Basin Scrub. Kern, San Bernardino, and Inyo Counties to Nevada; 2,100 to 7,650 feet | Unlikely; not observed |
| Newberry's Velvet-mallow *(Horsfordia newberryi*) | --- | --- | G4/S3.3 | 4 | Mostly rocky canyons and toeslopes in Sonoran Desert Scrub; 10 – 2,650 feet | Possible; not observed |
| Orocopia Sage (*Saliva greatae*) | BLM Sensitive | --- | G2/S2 | 1B | Mojavean and Sonoran Desert Scrubs; gravelly/ rocky bajadas, mostly near washes; below 3,000 feet | Not present; not observed |
| Palmer's Jackass Clover (*Wislizenia refracta palmeri*) | --- | --- | G5T2T4/S2? | 2 | Sandy washes and dunes in Sonoran Desert Scrub, to northwestern Mexico; potentially Mojave Desert (unverified); <430 feet | Possible; not observed |
| Parish's Club Cholla (*Grusonia parishii*) | --- | --- | G3G4/S2 | 2 | Joshua Tree Woodland in Mojavean and Sonoran Desert Scrubs; 1,000 -5,000 feet | Not present; not observed |
| Parry's Spurge (*Chamaesyce parryi)* | --- | --- | G5/S1.3 | 2 | Dunes an Aeolian soils in Mojavean Desert Scrub; in California, known only from Kelso; 1,300-2,400 feet | Unlikely due to limited range; not observed |

| Species | Status[1] | | | | Habitat | Likelihood of Occurrence on the Project Area[4] |
|---|---|---|---|---|---|---|
| | Federal | State | CNDDB Rank[2] | CNPS[3]/ Other | | |
| Pink Fairy Duster (*Calliandra eriophylla*) | --- | --- | G5/S2S3 | 2 | Sonoran Desert Scrub; washes; 393-4,920 feet | Not present; not observed |
| Pink Velvet Mallow *(Horsfordia alata)* | --- | --- | G4/S3.3 | 4 | Rocky areas in Sonoran Desert Scrub, 328-1,640 feet | Possible; not observed |
| Pointed Dodder *(Cuscuta californica* var. *apiculata*) | --- | --- | G5T3?/S2S3 | 3 | Sonoran and Mojavean Desert Scrubs in San Bernardino County (one record in western Riverside County), to Nevada and Baja, California; 0 – 1,650 feet | Possible; not observed |
| Ribbed Cryptantha *(Cryptantha costata*) | --- | --- | G4G5/S3.3 | 4 | Dunes in Mojavean and Sonoran Desert Scrub, 197-1,640 feet | Observed Spring 2011 |
| Sand Evening Primrose (*Camissonia arenaria*) | --- | --- | G4?/S2 | 2 | Sandy washes and rocky slopes below 1,300 feet | Possible; not observed |
| Slender Woolly-heads (*Nemacaulis denudata* var. *gracilis*) | --- | --- | G3G4T3?/S2 | 2 | Dunes in coastal and Sonoran Desert Scrubs, primarily in the Coachella Valley; below 1,500 feet | Possible; not observed |
| Spearleaf (*Matelea parvifolia*) | — | — | G5?/S2.2 | 2 | Rocky ledges and slopes, 1,000 to 6,000 feet, in Mojave and Sonoran Desert Scrubs | Unlikely due to lack of habitat and elevational constraints; not observed |
| Spiny Abrojo (*Condalia globosa* var. *pubescens*) | --- | --- | G5T3T4/S3.2 | 4 | Sonoran Creosote Bush Scrub; 500 to 3,300 feet | Not present; not observed |
| Thorny Milkwort (*Polygala acanthoclada*) | --- | --- | G4/S1 | 2 | Pinyon-Juniper and Joshua Tree Woodlands, Chenopod Scrub; 2,500-7,550 feet | Not present; not observed |
| Utah Cynanchum (*Funastrum utahense*) | --- | --- | G4/S3.2 | 4 | Sandy and gravelly areas in Mojavean and Sonoran Creosote Bush Scrub; 490 – 4,700 feet | Observed Spring 2011 |
| Winged Cryptantha *(Cryptantha holoptera*) | -- | -- | G3G4/S3? | 4 | 330-5,500 feet in Mojave and Sonoran Desert Scrubs; often sandy habitats | Possible; not observed |
| Amphibians | | | | | | |
| Couch's Spadefoot (*Scaphiopus couchii*) | BLM Sensitive | SSC | G5/S2S3 | _ | Various arid communities in extreme southeastern California and east, south | Possible; potential breeding habitat was observed Spring 2011 |
| Reptiles | | | | | | |
| Colorado Desert Fringe-toed Lizard (*Uma notata*) | BLM Sensitive | SSC | G3/S2? | _ | Restricted to aeolian sandy habitats in the southeastern Sonoran Desert | Unlikely due to geographic range; not observed |
| Desert Rosy Boa (*Charina trivirgata gracia*) | --- | --- | G4G5/ S3S4 | --- | Rocky uplands and canyons; often near stream courses | Unlikely due to lack of habitat; not observed |
| Mojave Fringe-toed Lizard (*Uma scoparia*) | BLM Sensitive | SSC | G3G4/ S3S4 | --- | Restricted to aeolian sandy habitats in the Mojave and northern Sonoran deserts | Observed during Spring 2011 surveys |
| Desert Tortoise (*Gopherus agassizii*) | T | T | G4/S2 | --- | Most desert habitats below approximately 5,000 feet in elevation | Carcass fragments and potential burrows observed Fall 2010 in ROW; burrow and carcass fragments observed on Linear Corridor. Tortoises and other sign observed Spring 2011. |

| Species | Status[1] | | | | Habitat | Likelihood of Occurrence on the Project Area[4] |
|---|---|---|---|---|---|---|
| | Federal | State | CNDDB Rank[2] | CNPS[3]/ Other | | |
| Invertebrates | | | | | | |
| California McCoy Snail (*Eremarionta rowelli mccoiana*) | --- | --- | G1/T1/S1 | --- | Talus slope; potentially endemic to McCoy Mts | Unlikely; possible in McCoy Mts outside of the Project Area |
| Riverside Cuckoo Wasp (*Hedychridium argenteum*) | --- | --- | G1/?S1? | --- | Dunes; one CNDDB record 18 mi west of Blythe along I-10; no other distribution information available, although may be endemic to Colorado Desert | Possible; not observed |
| Bradley's Cuckoo Wasp (*Ceratochrysis bradleyi*) | --- | --- | G1/S1 | --- | Dunes; one CNDDB record 6 mi north of Blythe, although may be endemic to Colorado Desert | Possible; not observed |
| Birds | | | | | | |
| American Peregrine Falcon (*Falco peregrinus anatum*) | Delisted BCC | Delisted Fully Protected | G4T3/S2 | --- | Dry, open country, including arid woodlands; nests in cliffs | Possible forager on site may nest in adjacent mountains. Observed off-site Spring 2011. |
| Bendire's Thrasher (*Toxostoma bendirei*) | BCC BLM Sensitive | SSC | G4G5/S3 | --- | Arid to semi-arid brushy habitats, usually with yuccas, cholla, and trees | Unlikely; not observed |
| Brewer's Sparrow (*Spizella breweri*) | BCC | -- (nesting) | G5/S3 | --- | Open meadows and flats | Observed Spring 2011 |
| Burrowing Owl (*Athene cunicularia*) | BCC BLM Sensitive | SSC | G4/S2 | --- | Open, arid habitats | Observed Spring 2011 |
| Crissal Thrasher (*Toxostoma crissale*) | BCC | SSC | G5/S3 | --- | Dense mesquite and willows along desert streams and washes | Highly unlikely due to lack of habitat; not observed |
| Ferruginous Hawk (*Buteo regalis*) | BCC | (wintering) | G4/S3S4 | --- | Arid, open country | Possible; not observed |
| Gila Woodpecker (*Melanerpes uropygialis*) | BCC | E | G5/S1S2 | --- | Requires woodlands containing large trees or columnar cactus for nesting | Unlikely nester/possible transient; not observed |
| Gilded Flicker (*Colaptes chrysoides*) | BCC | E | G5/S1 | __ | Large cactus forests of southwestern deserts. Requires woodlands containing large trees or columnar cactus for nesting. | Unlikely nester/possible transient; not observed |
| Golden Eagle (*Aquila chrysaetos*) | BCC | Fully Protected | G5/S3 | --- | Open country; nests in large trees in open areas or cliffs | Unlikely nester on site, possible forager on site. Inactive nests in McCoy Mountains.and individuals observed Spring 2011 |
| Le Conte's Thrasher (*Toxostoma lecontei*) | BCC | --- | G3S3 | --- | Open desert with scattered shrubs | Observed Spring 2011 |
| Loggerhead Shrike (*Lanius ludovicianus*) | BCC | SSC (nesting) | G4/S4 | --- | Arid habitats with perches | Observed Fall 2010 and Spring 2011 |
| Mountain Plover (*Charadrius montanus*) | BCC BLM Sensitive | SSC (wintering) | G2/S2? | --- | Dry upland habitats, plains, bare fields | Highly unlikely; not observed |

| Species | Status[1] | | | | Habitat | Likelihood of Occurrence on the Project Area[4] |
|---|---|---|---|---|---|---|
| | Federal | State | CNDDB Rank[2] | CNPS[3]/ Other | | |
| Northern Harrier (*Circus cyaneus*) | --- | SSC (nesting) | G5/S3 | --- | Open habitats; nests in shrubby pen land and marshes | Observed Spring 2011 |
| Prairie Falcon (*Falco mexicanus*) | BCC | (nesting) | G5/S3 | --- | Dry, open country, including arid woodlands; nests in cliffs | Observed Spring 2011 |
| Short-eared Owl (*Asio flammeus*) | --- | SSC (nesting) | G5/S3 | --- | Open habitats: marshes, fields; nests on ground and roosts on ground, low poles | Possible; not observed |
| Swainson's Hawk (*Buteo swainsoni*) | BCC | T | G5/S2 | --- | Forages in open stands of grass-dominated vegetation, sparse shrublands, and small, open woodlands | Unlikely nester, possible migrant. Observed Spring 2011 |
| Yellow-breasted Chat (*Icteria virens*) | --- | SSC (nesting) | G5/S3 | --- | Dense streamside thickets, willows; brushy hillsides and canyons | Highly unlikely due to lack of habitat, but possible transient; not observed |
| Mammals | | | | | | |
| American Badger (*Taxidea taxus*) | --- | SSC | G5/S4 | --- | Many habitats | Possible; observed outside of Project Area Spring 2011; digs observed within Solar Plant Site |
| Arizona Myotis (*Myotis occultus*) | --- | SSC | G3G4/S2S3 | WBWG:M | Lowlands of the Colorado River and adjacent mountain ranges, up to ponderosa pine habitat; mines, buildings, bridges, riparian woodlands, often near water | Unlikely; not observed[5] |
| Big Free-tailed Bat (*Nyctinomops macrotis*) | --- | SSC | G5/S2 | WBWG:M | Cliffs and rugged rocky habitats in arid, country, also riparian woodlands | Possible forager on site, especially near mountains; not observed[5] |
| Burro (*Equus asinus*) | --- | --- | --- | Protected | Various habitats near water | Possible; tracks observed 2007 in western ROW and scat observed Fall 2010 and Spring 2011 |
| Burro Deer (*Odocoileus hemionus eremicus*) | --- | Game Species | --- | --- | Arboreal and densely vegetated drainages | Possible; hide observed in Spring 2011; no scat or deer observed |
| California Leaf-nosed Bat (*Macrotus californicus*) | BLM Sensitive | SSC | G4/S2S3 | WBWG:MH | Lowland desert associate, found in caves, mines, tunnels and old buildings | Possible forager on site; not observed[5] |
| Colorado Valley Woodrat (*Neotoma albigula venusta*) | --- | --- | --- | --- | Under mesquite in Creosote Bush Scrub; southeastern California | Possible; not observed or captured during trapping |
| Desert Kit Fox (*Vulpes macrotis*) | --- | Protected furbearer | --- | --- | In open desert scrub and dunes | Sign observed Fall 2010 and Spring 2011; foxes observed off site |
| Mountain Lion (*Felis concolor browni*) | --- | SSC | G5T1T2Q S1 | --- | Colorado River bottomlands | Unlikely; possible forager on site; scat observed off-site near McCoy Mts Spring 2011 |
| Nelson's Bighorn Sheep (*Ovis canadensis nelsoni*) | BLM Sensitive | --- | --- | --- | In mountains and adjacent valleys in desert scrub | Unlikely; possible in McCoy Mountains; may forage at base of mountains |
| Pallid Bat (*Antrozous pallidus*) | BLM Sensitive | SSC | G5/S3 | WBWG:H | Several desert habitats | Possible; not observed[5] |
| Pocketed Free-tailed Bat (*Nyctinomops femorosaccus*) | --- | SSC | G4/S2S3 | WBWG:M | Variety of arid areas in pinyon-juniper woodland, desert scrubs, palm oases, drainages, rocky areas | Unlikely; Possible in the McCoy Mountains; not observed[5] |

| Species | Status[1] | | | | Habitat | Likelihood of Occurrence on the Project Area[4] |
|---|---|---|---|---|---|---|
| | Federal | State | CNDDB Rank[2] | CNPS[3]/ Other | | |
| Southwestern Cave Myotis (*Myotis velifer brevis*) | BLM Sensitive | SSC | G5/S1 | WBWG:M | Caves, mines and buildings in lower desert scrub habitats; also near streams and in woodlands, old ag fields | Unlikely; not observed[5] |
| Spotted Bat (*Euderma maculatum*) | BLM Sensitive | SSC | G4 /S2S3 | WBWG:H | Arid scrub and grasslands, to coniferous forests, roosts in cliffs, Forages along waterways | Unlikely; not observed[5] |
| Townsend's Big-eared Bat (*Corynorhinus townsendii*) | BLM Sensitive | SSC | G4/S2S3 | WBWG:H | Broad habitat associations. Roosts in caves and manmade structures; feeds in trees | Possible; not observed[5] |
| Western Mastiff Bat (*Eumops perotis californicus*) | BLM Sensitive | SSC | G5T4/S3? | WBWG:H | Cliffs, trees, tunnels, buildings in desert scrub | Possible; not observed[5] |
| Yuma Myotis (*Myotis yumanensis yumanensis*) | BLM Sensitive | --- | G5/S4? | WBWG:LM | Several habitat associations, but typically near open water; often roosts in manmade structures | Unlikely; not observed[5] |

Sources: Unless noted, information is from *The Jepson Manual* (Baldwin et al. 2002), California Native Plant Society (CNPS) Online Inventory (CNPS 2011), and Jepson Flora Project (http://ucjeps.berkeley.edu/)

[1] CDFG and Habitat Data Analysis Branch, Biogeographic Data Branch 2009, http://www.dfg.ca.gov/biogeodata/cnddb/pdfs/SPAnimals.pdf

E Endangered
T Threatened
BCC FWS Bird of Conservation Concern
State SSC CDFG Species of Special Concern (species that appear to be vulnerable to extinction)
Fully Protected Species that cannot be taken without authorization from the Fish and Game Commission
Status in parentheses (e.g., nesting, wintering) CNDDB tracks only the identified (e.g., nesting, wintering) locations of these species
BLM Sensitive Species under review, rare, with limited geographic range or habitat associations, or declining. BLM policy is to provide the same level of protection as FWS candidate species
WBWG = Western Bat Working Group (http://wbwg.org)
H – High Priority – These species should be considered the highest priority for funding, planning, and conservation actions.
M – Medium Priority – These species warrant closer evaluation, more research, and conservation actions of both the species and the threats
L – Low Priority – Most of the existing data support stable populations of the species and that the potential for major changes in status is unlikely

[2] CNDDB 2011: CDFG, CNDDB, Special Animals, January 2011 (www.dfg.ca.gov/biogeodata/cnddb/pdfs/spanimals.pdf) and CDFG Special Vascular Plants, Bryophytes, and Lichens List, January 2011 (www.dfg.ca.gov/biogeodata/cnddb/pdfs/SPPlants.pdf).

Global Rank State Rank Subspecies or Variety Rank and Other Symbols

G1 = Critically Imperiled
G2 = Imperiled
G3 = Vulnerable
G4 = Apparently Secure
G5 = Secure

S1 = Critically Imperiled
S2 = Imperiled
S3 = Vulnerable
S4 = Apparently Secure
S5 = Secure
SX= All California sites are extirpated

T1-T5: same definition as global and state ranks, except that rank only applies to the particular variety or subspecies.
X: species is considered extirpated

[3] CNPS. 2011:

List 1A - Plants presumed extinct in California
List 1B - Plants rare and endangered in California and elsewhere
List 2 - Plants rare and endangered in California but more common elsewhere
List 3 - Plants about which CNPS needs more information
List 4 - Plants of limited distribution (Watch List)
(Note: CNPS lists 1 and 2 require CEQA consideration. List 4 plants that must be surveyed per the Northern and Eastern Colorado Desert Management Plan (BLM and CDFG 2002) were also included for surveying)

Threat Ranks: 0.1-Seriously threatened in California (high degree/immediacy of threat)
0.2-Fairly threatened in California (moderate degree/immediacy of threat)
0.3-Not very threatened in California (low degree/immediacy of threats or no current threats known)

[4] Species that are woody or large and were not observed during any surveys are noted as "Not Present"; others that are unlikely or were not observed but are herbaceous and may not have germinated or had aboveground growth, were noted as "Not Observed", but were not excluded from possibly being on the site. Summer annuals (a.k.a. "fall-blooming annuals") are not annotated as they have yet to be surveyed during a period of adequate rainfall.

[5] Not observed; however, no nocturnal surveys were conducted.

## 5.3 CULTURAL AND HISTORIC RESOURCE SITES AND VALUES

Cultural resources are sites, structures, landscapes, and objects of importance to a culture or community for scientific, traditional, religious, or other reasons. To identify documented cultural resources in the MSEP area, a literature and records search of the cultural resources site and Project file collection at the Eastern Information Center of the California Historical Resources Information System at the Department of Anthropology, University of California, Riverside, were conducted in 2007. Additional literature and records searches revealed four cultural resource investigation and two archeological sites in the MSEP region.

Although outdated, a Class I literature and records search in 2007 did not identify any cultural resources within 1 mile of the proposed irradiance meter and well sites located within and adjacent to the Solar Plant Site. Following the Class I review, an additional Class III review was done along the site access road and at the meteorological stations now located on the site. Cultural resources were identified in the vicinity of the Solar Plant Site including historic refuse piles and tank or jeep tracks on pebble terraces (desert pavement). Additionally, a reconnaissance survey was conducted in August 2010 that identified prehistoric and World War II Desert Training Center archeological sites within the site vicinity.

A Class III Cultural Resource Investigation was conducted of the Solar Plant Site and Linear Corridor in spring 2011 and a draft report was provided to the BLM in June 2011 (AECOM 2011b).

## 5.4 NATIVE AMERICAN TRIBAL CONCERNS

Native American Heritage Commission will be notified of the proposed Project and a request for review of their Sacred Lands Inventory files will be made to determine if any recorded sacred lands are on or near the proposed Project area. The Native American Heritage Commission will be requested to provide a list of tribes affiliated with the proposed Project area. Each tribe will be notified and invited to provide comments regarding cultural resources they may have knowledge of on or near the proposed MSEP.

## 5.5 RECREATION AND OFF-HIGHWAY VEHICLE (OHV) CONFLICTS

The MSEP area contains some unmaintained open off-road vehicle routes. The Applicant will work with the BLM to minimize impacts to OHV areas. Two roads that pass through the MSEP footprint (Black Creek Road and another unnamed dirt road) will be blocked where they pass through the Solar Plant Site.

## 5.6 OTHER ENVIRONMENTAL CONSIDERATIONS

### 5.6.1 Soil and Water Resources

Soils

The main Project area is situated on alluvial sediments at the base of the McCoy Mountains. The Project area gently slopes to the east and southeast across the site. Slope steepness across the proposed gen-tie locations is generally similar, although slope direction changes in relation to topographic controls in the immediate vicinity. Most drainage across the Project area and gen-tie locations is directly into the ground due to the low amount of precipitation and high infiltration rates. Local drainage systems formed from intense precipitation events are typically intermittent distributary channels and mostly dry wash environments. In gently sloping alluvial

sediments and typically dry drainage system areas, soils are generally gravelly sands to sandy loams.

Soil survey maps are normally acquired through the National Resources Conservation Service State Soil Geographic Database Soil Data (USDA 2008); however, this area has not been mapped and is not included in their data set. Therefore, the California Soil Resource Lab (CSRL) database was used to assess the site in conjunction with a historic University of California and USDA 1922 soils map. The CSRL and 1922 data maps both indicate that soils are generally gravelly loams and sandy loams derived from the upland McCoy Mountain Mesozoic sedimentary and metasedimentary rocks. CSRL indicated that the two soil units in the MSEP area are the Cheriono-Hyder-Cipriano complex (65 percent) and the Gunsight-Rillito-Chuckawalla (35 percent). The gen-tie corridor crosses both of these two units in addition to the southerly Aco-Rositas-Carrizo complex and the Rositas-Carsitas-Dune land complex (see Figure 5-2 and the Table 5-2). Soil grades from gravelly and coarser alluvial sediments near the McCoy Mountains to finer and sandy alluvial sediments with increased distance.

**Table 5-2 Soil Units in MSEP Area**

| Soil Name | Description |
|---|---|
| Gunsight-Rillito-Chuckawalla | The Gunsight-Rillito-Chuckawalla series consists of very gravelly loam to gravelly sandy loam to very gravelly silt loam formed in mixed alluvium. Soils are considered somewhat excessively drained, shrink swell potential is low, and soils are considered prime farmland if irrigated. |
| Cheriono-Hyder-Cipriano | The Cheriono-Hyder-Cipriano series consists of gravelly fine to sandy loam formed in fan alluvium. Soils are considered somewhat excessively drained, shrink swell potential is low, and soils are considered prime farmland if irrigated. |
| Aco-Rositas-Carrizo | The Aco-Rositas-Carrizo series consists of gravelly sand to sandy loam to fine sand in fan remnants and eolian sands. Soils are considered somewhat excessively drained, shrink swell potential is low, and soils are considered prime farmland if irrigated. |
| Rositas-Carsitas-Dune | The Rositas-Carsitas-Dune series consists of gravelly sand to fine sand in fan remnants, valley fill, and eolian sandy material. Soils are considered somewhat excessively drained, shrink swell potential is low, and soils are considered prime farmland if irrigated. |

Water Resources

The MSEP is located in the arid southwest, a region that is characterized by extenuated periods with no rainfall followed by short intense rainfall events. Precipitation in the Project area averages up to 6 inches a year, although less than 6 inches is common (Department of Water Resources [DWR] 2004). The MSEP area is located mostly on alluvial fan sediments derived from the McCoy Mountains to the west of the MSEP area, although parts of the gen-ties extend to the south and west of the McCoy Mountains. Surface water is typically generated from short intense rainfall events and springs along the base of the McCoy Mountains. Due to the very high infiltration capacity of the sediment, most surface water quickly infiltrates into the ground. Only intense rainfall events are capable of producing surface water that flows through the shallow moderately defined distributaries channels and washes.

The MSEP area is located in the Palo Verde Groundwater Basin (DWR Basin 7-39), a subset of the greater Colorado River Hydrologic Region. The groundwater basin is generally bounded by nonwater-bearing rocks including the Big Maria and Little Maria Mountains on the north, the McCoy Mountains to the west, the Palo Verde Mesa on the east, and the Palo Verde Mountains on the south. Groundwater in the basin is stored in Quaternary alluvial deposits including sands,

gravels, silts, and clay. At the foot of the mountains water bearing formations are mostly coarse grained and angular upland rock detritus.

Groundwater in the basin generally flows from the surrounding basin towards the McCoy Wash where it then flows southeast and towards the Colorado River. Groundwater flow is also influenced by and supplemented by adjacent groundwater basins. These adjacent basins are estimated to supply nearly 400 AF/yr. There are no known restrictive geologic structures in the area that inhibit groundwater flow. Groundwater storage capacity is estimated to be 6,840,000 AF, although accessible water may be closer to 5,000,000 AF (DWR 2004). Groundwater quality in the region is calcium-sodium sulfate in character and typically has total dissolved solid concentrations ranging from 730 to 3,100 milligrams per liter. Groundwater extraction in the basin is mostly for irrigation, municipal, and residential use.

### 5.6.2 Geologic Resources and Hazards

The MSEP's potential effects on geologic resources and the potential geologic hazards that may be encountered by the Project are discussed below. The Project vicinity and regional geology are presented in Figure 5-3.

Geologic Setting

The MSEP area is located in the southeastern margin of the Mojave Desert geomorphic province (California Geologic Survey [CGS] 2002). The Mojave Desert region is a broad expanse of isolated mountain ranges separated by broad alluvial filled basins. The floodplain of the Colorado River forms the eastern margin of this geomorphic province, located 10 miles east of the MSEP site. The MSEP is generally bounded by the Little Maria and Big Maria Mountains to the north, the McCoy Mountains to the west, the Palo Verde Mesa on the east, and the Palo Verde Valley on the south. Parts of the MSEP gen-tie lines extend south of the general Project area, and then west between the southern end of the McCoy Mountains and the northern edge of the Mule Mountains. The majority of the MSEP is located on alluvial fans ranging from 380 to 800 feet in elevation with slopes up to 2.0 percent.

The regional geology has resulted from a complex history of rising and falling sea level, plutonic emplacement, metamorphism, volcanism, extensional faulting, and erosion. The geology primarily consists of Proterozoic (greater than 590 million years old [my]) metasedimentary and granitic rocks; Paleozoic (248 to 590 my) marine metasedimentary rocks; Mesozoic (251 to 66 my) volcanic rocks; and Miocene to Holocene (23 my to present) sedimentary and alluvial deposits (CGS 2010). The alluvial valleys in the region can be underlain by over 1,000 feet of alluvial fill from the surrounding uplands. The Palo Verde Valley is underlain by the Bouse Formation, a combination of interbedded silts, sands, and clay beginning at 500 to 600 foot depth (Metzger 1973).

The region has a complex structural history where extensional and contractional deformation has resulted in folded and overturned beds and the uplift of the surrounding mountains. Gravity anomalies in the region suggest tertiary dip-slip fault movement with right lateral offset (Richard 1993). These faults run parallel to the McCoy Wash and do not appear to offset surficial sediment. Quaternary deformation and slip mostly occurs approximately 40 miles to the west in the eastern California shear zone (62-mile wide zone of deformation resulting from the San Andreas Fault and Basin and Range extensional faulting). The shear zone accommodates 6-14 millimeters per year of right lateral slip, accounting for approximately 15 percent of the North American – Pacific plate relative motion (Peltzer, et al. 2001). This zone is capable of producing

magnitude >7.0 earthquakes and could cause significant seismicity near the MSEP. Quaternary faulting near the Project appears to be limited to a small pair of northwest trending normal faults on the southwest side of the Big Maria Mountains.

Local surficial geology within the Project area consists of approximately 3,000 acres of Quaternary sediment (Figure 5-3). The Quaternary sediment is mostly active alluvial fans with active washes that are generally between 1 to 4 feet in depth. Other Quaternary sediments near the southern parts of the gen-tie lines consist of relic inactive parts of alluvial fans and eolian deposits. The main MSEP area is transected by a northwest trending subsurface normal fault inferred from gravity data and the southern part of the gen-tie is transected by a concealed thrust fault and normal fault (Richard 1993). These faults are expected to be inactive since there is no visible evidence of offset quaternary sediments (Stone 2006). The closest active fault in the USGS Quaternary fault and fold database is the Aztec Mine Wash fault approximately 30 miles to the southwest. Detailed mapping has suggested that a small graben structure associated with an active normal fault is located east of the site between the Big Maria Mountains and the McCoy Wash. In general the site is located in a seismically active region with a maximum probable ground shaking acceleration between 9 to 10 percent of gravity.

Geologic Hazards

**Ground Shaking/Seismicity**

The MSEP is located in seismically active Southern California, a region that has experienced numerous earthquakes in the past. While the site does not lie within a state-established Earthquake Fault Zone (EFZ), it is located about 25 miles northeast of the active Aztec Mine Wash fault and approximately 60 miles east of the San Andreas Fault Zone. Regional faults are capable of generating Magnitude 7 earthquakes and subjecting the MSEP to ground shaking up to 10 percent gravity. Therefore, structures must be designed to comply with the latest CBC or IBC requirements.

**Surface Rupture/Alquist-Priolo Earthquake Fault Zoning Act**

The Alquist-Priolo Earthquake Fault Zoning Act was enacted by the State of California in 1972 to mitigate the hazard of surface faulting to structures planned for human occupancy and other critical structures. In doing so, the State established regulatory zones, known as EFZs around the surface traces of active faults. Within these zones, development permits are withheld until geologic investigations demonstrate that ground rupture is not a threat. Based on a review of Alquist-Priolo Earthquake Fault Maps, the MSEP site does not lie within an EFZ and, therefore, the risk of earthquake-induced ground rupture is considered to be insignificant.

**Slope Stability**

The majority of the MSEP is not considered to be in an area with the potential for permanent ground displacement due to gravity or earthquake-induced landslides. High slope areas near the McCoy Wash and McCoy Mountains have the potential for slope failure, but are not sufficiently close that they pose a threat to the site.

**Erosion**

Erosion is the displacement of soils (soil, mud, rock, and other particles) by wind, water, or ice and by downward or down-slope movement in response to gravity. Soil characteristics at the site are susceptible to wind and water erosion. Altered drainage patterns and loss of ground

cover due to proposed Project development have the potential to increase erosion in and around the site. Construction activities will increase the potential for soil loss without the implementation of BMPs. The implementation of a construction SWPPP with design BMPs such as installation of drainage structures is expected to reduce water and wind erosion of soils to less than significant levels.

### Subsidence

Subsidence is the sudden sinking or the gradual downward settling of the land surface that is often related to groundwater drawdown, compaction, tectonic movements, mining, or explosive activity. Subsidence can cause significant damage to properties in the form of differential settling, sinkholes, or ground fissures. Potential sources of subsidence in the Project area are groundwater withdrawal and seismic shaking. Subsidence due to groundwater withdrawal has been documented in various regions of the Mojave Desert and the Project site is in an area considered to be susceptible to subsidence. Groundwater withdrawal in the immediate vicinity of the Project is not significant; however, large amounts of development near the site will likely occur over the next decade and groundwater withdrawal is expected to increase dramatically. Development over the next several years and groundwater withdrawal from the aquifer does increase the potential for ground subsidence in the future.

### Collapsible Soil Conditions

Alluvial soils in arid and semi-arid environments have a tendency to possess characteristics that make them prone to collapse with increase in moisture content even without increase in external loads. The MSEP is located in a geologic environment where the potential exists for collapsible soils. Prolonged wetting of the on-site soils is not expected as surface drainage will be directed to flow to an off-site area. Depending on the findings of the geotechnical studies the following mitigation measures will be implemented, if necessary:

- Pre-watering of the plant to induce hydro-consolidation in advance of the grading program
- Removing collapsible soils as part of the grading program

### Liquefaction

Liquefaction is the process where cohesion-less soil or loosely packed sediment, typically saturated, undergoes loading or seismic shaking that causes a mass to fail and transform from a solid into liquid state. This typically occurs near the surface with poorly consolidated, highly saturated, well sorted, and finer grained materials. The MSEP site has poorly sorted coarse grained material, and with groundwater typically greater than 100 feet below ground surface (DWR 2010), the site has relatively low susceptibility to liquefaction.

### Expansive Soil

Expansive soil consists of fine-grained clay which occurs naturally. It is found in areas that were historically a floodplain or lake area, but can occur in hillside areas also. Expansive soil is subject to swelling and shrinkage, varying in proportion to the amount of moisture present in the soil. As water is initially introduced into the soil (by rainfall or watering), expansion takes place. If dried out, the soil will contract, often leaving small fissures or cracks. Excessive drying and wetting of the soil can progressively deteriorate structures over the years because it can lead to

differential settlement within buildings and other improvements. Soil series in the Project area are rated for a low shrink/swell potential.

### 5.6.3 Paleontological Resources

Preliminary studies indicate there are no known paleontological resources in the MSEP area. The Bouse Formation, known to carry fossils and exposed at the surface south of Blythe, is buried at least 100 feet under other alluvial layers in this location. However, in compliance of NEPA/California Environmental Quality Act (CEQA) requirements, literature and field surveys will be conducted for the MSEP area to determine the presence of paleontological resources.

Whenever possible, paleontological resources located within the MSEP area will be avoided by adjustments during final design of the site layout, access roads, and/or laydown areas. However, the potential remains that the MSEP may impact a previously unidentified resource in an unanticipated manner. Prior to the start of construction, a MSEP paleontologist will be retained to design and implement a mitigation program during Project-related earth-moving activities. As part of the program, construction personnel involved with earth-moving activities will be informed of the possibility of encountering fossils, how to identify fossils, and proper notification procedures.

### 5.6.4 Noise

The proposed MSEP will not have a significant adverse impact on local noise levels. The McCoy Mountains are located west of the MSEP site, while the Big Maria Mountains are located east of the MSEP site. The nearest residence appears to be located approximately 1 mile from the site and will not be affected by an increase in noise during construction. During the construction period, a variety of heavy equipment will be utilized along the proposed ROW, and noise generated during construction of the proposed facilities could result in temporary increases in noise levels.

Noise from operation of the MSEP is unlikely to be a concern in this area given the distance from any residences. Additionally because the MSEP uses PV technology, there should be very few activities that generate loud noises. There will be vehicular traffic with small trucks or similar vehicles but heavy equipment should only be required in rare circumstances.

### 5.6.5 Visual Resources

The visual setting of the MSEP is a desert landscape with unmaintained, but open dirt roads and trails, and very few scattered residences located south and east of the site. The McCoy Mountains rise from the desert plain to the west of the site. Additionally, vegetation is sparse, consisting of creosote bush scrub.

#### Federal

Since the proposed Project is mostly located on land managed by the BLM, a visual study will be required pursuant to the NEPA review process. Since the Palm Springs Field Office has not developed Visual Resource Management classes, the proponent will be required to develop interim Visual Resource Management classes and conduct the analysis of the proposed development based on those classes (CDCA Plan, BLM 1999a). Visual resources in the MSEP area will be managed in accordance with BLM guidelines for the “Limited” classification. For activities that involve alteration of the natural character of the landscape, the BLM requires that

the extent of change created in a landscape be determined and appropriate design or mitigation measures be specified using BLM's contrast rating process.

**State**

CEQA Guidelines have a category for aesthetics that require the evaluation of scenic vistas, determination of damage to scenic resources, determination of the degradation of the visual character or quality of a site, and the determination of the creation of light or glare which will affect the day or night time views of the area. This CEQA aesthetic analysis will be conducted in concert with the BLM visual resource analysis.

**Potential Impacts**

It is likely that there will be no visual resources issues; the site is remote and far enough away from scenic views that significant visual issues are not expected.

The PV modules may be visible for many miles and their presence will change the visual character of the area. The solar facility will be located in a fairly isolated area diminishing the visual impact. Visual impacts will be greatest for OHV recreationists on the unmaintained dirt roads, hikers in the local area and McCoy Mountains, and possibly for the one or two residences located nearest to the MSEP site. The MSEP will design Project structures visible to the public (other than the PV modules) to minimize the contrast with the surrounding natural environment. The MSEP will design and install lighting at the facility such that it is directed toward MSEP facilities and is shielded to minimize visibility from nearby receptors.

### 5.6.6 Waste Management

Currently the MSEP area is undeveloped and no waste is generated or known to have been disposed of on-site. However, the proposed facility will generate wastewater, solid non-hazardous waste, and small volumes of marginally hazardous waste.

Waste management during the construction and operation of the proposed Project will not cause a significant adverse impact on the environment. Wastes generated during construction and operation of the proposed MSEP will be recycled to the extent practicable. Wastes include non-hazardous solid and liquid wastes (e.g., scrap metal and vehicle wash water), as well as small amounts of hazardous solid and liquid wastes (e.g., paint cans and waste lubrication oil). Appropriate procedures and personnel training will provide assurance that non-hazardous and hazardous wastes are properly handled and do not significantly affect the environment or health and safety. They include the following:

- The Applicant or its contractor will obtain a hazardous waste generator identification number from the DTSC prior to generating any hazardous waste.
- Prior to the start of construction and operation, a waste management plan will be developed to address all wastes generated during construction and operation of the facility, respectively. This document will be submitted to the BLM for review and comment.

## 5.7 MITIGATION MEASURES PROPOSED BY APPLICANT AND INCLUDED IN POD

### 5.7.1 Biological and Ecological Mitigation Measures

The following methods may be utilized to mitigate biological and ecological impacts:

- Prior to the start of Project construction, the Applicant will designate a Project Biologist who will develop and implement a biological monitoring and mitigation plan.
- As may be required under Project permits, a biological monitor will be present during construction activities to assist in the avoidance and minimization of impacts to special-status species and their habitats.
- Construction area boundaries will be clearly marked to limit surface disturbance and habitat impacts to areas needed for construction, thereby preventing unnecessary habitat loss. The Project environmental compliance staff will review all site plans and provide written approval prior to any surface disturbance.
- Off-road travel will be prohibited during construction and operation. Construction traffic will be restricted to approved access roads and work areas. Such areas will be clearly marked prior to initiation of construction; approved parking and temporary staging areas will be designated as appropriate.
- Speed limits will be developed with consideration for potential wildlife mortalities and reduction of dust emissions. Speed limits will be posted on and near the Project work areas and strictly enforced.
- An environmental awareness program will be developed to educate employees about sensitive biological resources that may occur within the Project area, and to provide background and reasons for restrictions, legalities, and appropriate procedures that must be followed. This training will be provided to all contractors and subcontractors that will be working on the job site prior to entering the job site. Employees will sign an attendance sheet documenting their participation in the program and will be provided with written materials for reference.
- A litter control program will be developed and enforced during construction and operations. Litter (human trash and waste) is a concern because it may attract predators (e.g., common raven) to the area and consequently increase the likelihood of predation on special-status species (e.g., desert tortoise). Additionally, animals may ingest or becoming entangled in foreign matter, which will be prevented or minimized by a litter control program.
- Restoration of temporarily disturbed areas in native habitat will follow recommended procedures including recontouring disturbed areas to the original contours, topsoil salvage and spreading, ripping, seeding, and mulching, as appropriate. This measure will provide mitigation for temporarily disturbed areas and will restore habitat for use by wildlife.
- Unavoidable impacts to habitats of federal- and state-listed threatened or endangered species will be compensated as appropriate.

### 5.7.2 Cultural Resources Impacts Mitigation

Wherever possible, cultural resources located within the MSEP area will be avoided by adjustments of the site layout, access roads, and/or laydown areas during final design. However, there is always a potential that the Project may impact a previously unidentified resource or an identified historical resource in an unanticipated manner. An MSEP archaeologist will be assigned to ensure cultural resources are properly dealt with during construction and will be responsible for training construction employees in the identification of suspected new sites, reporting, and preservation of existing and suspected new sites. A Cultural Resource Monitoring and Mitigation Plan will also be developed.

The following additional steps will be taken before and during construction to avoid impacts to cultural resources:

- For each cultural resource, a qualified archaeologist will clearly designate its boundaries with marker flags.
- The construction crew will be made aware of all archaeological site locations.
- Construction activities will avoid any flagged cultural resource sites.
- Although it is not anticipated, there is always a potential for buried cultural resources and/or human remains that were not identified during field studies to be inadvertently unearthed during ground-disturbing activities associated with the proposed action. Such an occurrence could result in the unearthing of, and disturbance or damage to, significant cultural resources or human burials. To avoid this potential impact on cultural resources or human burials, the following directives will be implemented during site construction activities:
  - Stop work if cultural resources are discovered during ground-disturbing activities. If buried cultural resources, such as chipped or ground stone, historic debris, building foundations, or nonhuman bone are inadvertently discovered during ground-disturbing activities, work will stop in that area and within 100 feet of the find until a qualified archaeologist can assess the significance of the find and, if necessary, develop appropriate treatment measures. Treatment measures typically include development of avoidance strategies, capping with fill material, or mitigation of impacts through data recovery programs such as excavation or detailed documentation. The construction contractor and lead contractor compliance inspector will verify that work is halted until appropriate treatment measures are implemented.

If human remains of Native American origin are discovered during ground-disturbing activities, it is necessary to comply with state laws relating to the disposition of Native American burials, which falls within the jurisdiction of the Native American Heritage Commission. If human remains are discovered or recognized in any location other than a dedicated cemetery, there will be no further excavation of disturbance of the site or any nearby area reasonably suspected to overlie adjacent human remains until (1) the County Coroner has been informed and has determined that no investigation of the cause of death is required; and (2) if the remains are of Native American origin, the means of treatment or disposal must be done with appropriate dignity, as provided in Pub. Res. Code Sec. 5097.98.

### 5.7.3 Soil and Groundwater Resource Impacts Mitigation

Proposed mitigation measures may be implemented to reduce impacts to soils and water resources in areas affected by the proposed Project, including the Solar Plant Site, gen-tie lines, and ancillary facilities. Additionally, measures will be implemented to minimize impacts to the soil resources, control erosion, and reduce associated water quality-related impacts. The following mitigation measures may be implemented:

- Design Solar Plant Site drainage plans to be in conformance with the Riverside County Hydrology Manual (Riverside 1978) and local ordinances.
- Provide appropriate stormwater drainage for the Solar Plant Site to minimize soil erosion and sediment transport associated with runoff from the site.
- During construction of pipelines and transmission lines, utilize existing roads to limit disturbance. Implement BMPs to control soil erosion. Design and locate foundations and pipeline stream crossings in accordance with the County of San Bernardino Hydrology Manual and local ordinances.
- Space water supply wells to minimize water level drawdown, and monitor groundwater levels and use this data to identify long-term groundwater trends.

### 5.7.4 Mitigation of Geologic Hazards

The proposed MSEP will not have a significant adverse impact on geologic resources or cause significant geologic hazards. The following BMPs are included in the MSEP design:

- The proposed MSEP, including all structures and equipment, will be designed in compliance with the most recent CBC or equivalent IBC requirements. No significant impacts relative to geologic resources and hazards are expected and no additional mitigation measures are proposed.
- Potentially adverse foundation conditions that may be encountered during construction can be mitigated through appropriate design and construction of the solar Project site in accordance with the recommendations in the Geotechnical Report.
- An engineering geologist(s), certified by the State of California, will be assigned to the Project to carry out the duties required by the CBC, including preparation of an Engineering Geologic Report, and to periodically monitor geologic conditions during construction, approve actual design features and mitigation measures used to protect the facility from geologic hazards, and prepare the final Geologic Grading Report.

### 5.7.5 Noise Impact Mitigation

Alleviation of noise disturbances will include the following actions:

- Throughout the construction and operation of the MSEP, the Project owner will document, investigate, evaluate, and attempt to resolve all Project-related noise complaints.
- Prior to the start of Project-related ground disturbing activities, a noise control program will be developed. The noise control program will be used to reduce employee exposure to high noise levels during construction and also to comply with applicable Occupational Safety and Health Administration (OSHA) and California Occupational Safety and Health Administration (Cal-OSHA) standards.
- Noisy construction work (which causes off-site annoyance, as evidenced by the filing of a legitimate noise complaint) will be restricted to the times of day delineated below:
  - Drilling or pile driving activities, without the use of a silencer and blasting (in the unlikely case it is needed): 8 a.m. to 5 p.m.
  - Other noisy work: According to Riverside County Ordinance.

### 5.7.6 Air Emissions Control and Monitoring

The MSEP site is located in eastern Riverside County in the Mojave Desert Air Basin. Air quality in the Mojave Desert Air Basin, of which eastern Riverside County as far south as Blythe forms the southernmost portion, is generally good (MDAQMD 2007). There are, however, times that the area does not meet air quality standards due to locally generated and/or wind transported pollutants. Eastern Riverside County is currently classified as a federal attainment area for all pollutants under national standards (EPA 2007), but is in non-attainment for ozone and particulate matter, less than 10 micrometers in diameter ($PM_{10}$) by state standards.

### Applicable Regulations and Permits

The MSEP uses PV technology and does not produce significant air emissions. The key air emission issue is the control and minimization of dust emissions from the construction and regular Project operations. This will be addressed in a Dust Control Plan which will be submitted to BLM and Mojave Desert Air Quality Management District (MDAQMD) and will be addressed in detail in the NEPA/CEQA documentation.

### Federal New Source Review and Title V Programs

The MDAQMD has identified that the New Source Review and Title V provisions of the Federal Clean Air Act will not apply to the MSEP because it is a PV-technology project, and that no permits will be required under these programs.

### State

The California State Health and Safety Code, Section 41700, requires that no person shall discharge from any source whatsoever such quantities of air contaminants or other material which causes injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, response, health, or safety of any such person or the public, or which causes, or have a natural tendency to cause, injury or damage to business or property.

The State's Air Resources Board promulgates state-level ambient air quality standards, which are, in general, more stringent than the national ambient air quality standards. MDAQMD has state air quality jurisdiction over any new source of air pollution, whether temporary (i.e., construction) or permanent (i.e., operation). MDAQMD has identified that the requirement for an Authority to Construct and a Permit to Operate would be apply if there is there is fuel stored on-site (gasoline at any quantity and diesel fuel if over 40,000 gallons) or stationary diesel-fueled internal combustion engines (i.e., for emergency generators or fire pumps, or similar equipment) with motor horsepower exceeding 50 brake-horsepower.

A Dust Control Plan will need to be prepared for the site and submitted to the agencies.

### Project Air Pollution Sources

**Construction:** The construction phase of the MSEP will be characterized by emissions common to any construction project. These emissions will be primarily fugitive dust ($PM_{10}$ and particulate matter less than 2.5 microns in diameter [$PM_{2.5}$]) from construction operations such as land clearing, grading, cut and fill operations, foundation excavation, road development, etc.; and exhaust emissions from construction equipment for pollutants such as $PM_{10}$ and $PM_{2.5}$, nitrogen oxide, oxides of sulfur, volatile organic compounds, and carbon monoxide.

Construction emissions will be short term in nature, and will be mitigated by implementing and adhering to the agency regulations applicable to fugitive dust control, such as (1) watering of exposed areas, (2) use of dust suppressant agents where feasible, (3) speed control, (4) cessation of activities during high wind periods, (5) trackout and vehicle washing areas, etc., and by implementing a series of measures to mitigate the effects of the construction equipment emissions, such as (1) use of low sulfur diesel fuels, (2) use of low aromatic diesel fuels, (3) control idling time for on-site equipment, and (4) equipment scheduling to minimize the on-site time and use rates of various classes of construction related equipment. Detailed mitigation measures will be formalized in the air permit process and in the NEPA/CEQA process.

**Operation:** The operational phase may be characterized by small amounts of emissions from support processes such as internal combustion engines which will provide emergency power and fire pump drive capability. The emissions from this equipment will depend upon the sizing and use rates anticipated. However, it is unlikely that these engines will exceed the 50 brake-horsepower permitting threshold.

Operational emissions will be primarily related to dust control and will be mitigated by implementing and adhering to the Dust Control Plan applicable to the MSEP.

The operation of the MSEP will not generate a substantial amount of air pollution, and is expected to aid in the overall reduction of particulate matter and carbon dioxide in the U.S. California carbon dioxide equivalent emissions are estimated to be about 6.2 percent of the U.S. emissions, or 438 million metric tons per year. Thus, the MSEP is expected to benefit California air quality because it will provide air-pollution free energy and reduce the need for fossil fuel-fired generation.

### 5.7.7 Hazardous Material Management

There will be a minimal amount of chemicals stored and used during construction and operation of the MSEP. However, the storage, handling, and use of all chemicals will be conducted in accordance with applicable laws, ordinances, regulations, and standards. Chemicals will be stored in appropriate chemical storage facilities. Bulk chemicals that are anticipated to be present on-site are drum quantities of transformer oil and possibly water treatment chemicals, such as sulfuric acid and sodium hydroxide.

Safety showers and eyewashes will be provided adjacent to or in the area of all chemical storage and use areas. Appropriate PPE will be used by plant personnel during spill containment and cleanup activities. Personnel will be properly trained in the handling of these chemicals and instructed in the procedures to follow in case of a chemical spill or accidental release. Adequate supplies of absorbent material will be stored on-site for spill cleanup.

Electric equipment insulating materials will be specified to be free of polychlorinated biphenyls.

### 5.7.8 Storage and Use of Hazardous Materials

Hazardous materials will be stored in proper containers in material yards and designated construction areas. Cleanup materials (spill kits) will also be stored in these areas.

Fuel, oil, and hydraulic fluids used in on-site vehicles will be transferred directly from a service truck to construction equipment and will not otherwise be stored on-site. Designated, trained service personnel will perform fueling either prior to the start of the workday or at completion of the workday. Service personnel and construction contractors will follow standard operating procedures for filling and servicing construction equipment and vehicles. The standard operating procedures are designed to reduce the potential for incidents involving the hazardous materials and include:

- Refueling and maintenance of vehicles and equipment will occur only in designated areas that are either bermed or covered with concrete or asphalt to control potential spills.
- Only authorized personnel will conduct vehicle and equipment service and maintenance.
- Refueling will only be conducted with approved pumps, hoses, and nozzles.

- Catch-pans will be placed under equipment to catch potential spills during servicing.
- All disconnected hoses will be placed in containers to collect residual liquids in the hose.
- Vehicle engines will be shut down during refueling.
- No smoking, open flames, or welding will be allowed in refueling or service areas.
- When refueling is completed, the service truck will leave the worksite.
- Service trucks will be provided with fire extinguishers and spill containment equipment, such as adsorbents.

In the event a spill contaminates soil, the soil will be containerized and disposed of in an appropriate manner based on classification of the soil as either a hazardous or non-hazardous waste.

During Project operations, hazardous materials will be stored inside the O&M Building, in separate areas within secondary containment areas.

### 5.7.9 Blasting

Although the need for blasting during construction is not anticipated, in the event that blasting becomes necessary in limited instances, the transportation, storage, and use of explosives could create increased risk of injury to construction workers and the public. Any and all explosives necessary for construction activities will be transported by a licensed contractor who will ensure compliance with State of California Safety Orders (Cal-OSHA) Title 8, Section 1564 and California Vehicle Code, Division 14 requirements for vehicle transportation of explosives on public roadways. All blasting will be conducted by a contractor with a valid California "Blaster License" pursuant to Cal-OSHA Title 8, Section 1550-1580. Such handling and adherence to regulatory requirements will reduce the potential for worker and public injury to less-than-significant levels, and no additional mitigation is necessary.

If blasting is planned, all workers will be instructed in the proper safety protocols, blasting areas and schedules, and safe locations.

### 5.7.10 Stormwater Pollution Prevention and Protection Plan (Supplemental Information)

California state law, under the Porter-Cologne Act, provides the RWQCB the authority to require projects greater than 1 acre in size to file a Report of Waste Discharge with them. The RWQCB may require a plan for managing the surface water runoff and an Industrial Storm Water Discharge Permit. They may also require a SWPPP and description of the BMPs that will be used to control discharges of sediments and other pollutants from the Solar Plant Site. These plans follow specific, standard published guidelines.

Determinations of the manner in which these requirements will be implemented by the RWQCB have not been made for the MSEP yet.

However, in general, construction activities that disturb equal to or greater than 1 acre may be required to obtain coverage under California's General Permit for Discharges of Stormwater Associated with Construction Activity, Water Quality Order 2009-0009-DWQ (General Construction Permit CAS 000002). Activities subject to permitting generally can include clearing, grading, stockpiling, and excavation of both a single area and Linear Facilities that exceed 1 acre of total disturbance. If applied to the Project, the general permit requires that a Notice of Intent be filed with the State Water Resources Control Board prior to the planned start of

construction, and that a SWPPP which describes the protection and BMPs to be used, would need to be prepared and submitted to the State prior to the start of construction. The responsibility for regulatory oversight of the general permit and SWPPP implementation lies with the California RWQCB (Colorado River Region).

The requirements of the General Construction Permit include the development and implementation of a SWPPP that specifies BMPs which will reduce or prevent construction pollutants from leaving the site in storm water runoff and will also minimize erosion associated with the construction project. The SWPPP would contain site map(s) that show the construction site perimeter, existing and proposed structures and roadways, storm water collection and discharge points, general topography both before and after construction, and drainage patterns across the site. Additionally, the SWPPP would describe the monitoring program to be implemented. Construction and industrial operations at the site would be subject to the California General Construction and General Industrial Storm Water National Pollutant Discharge Elimination System (NPDES) permits, respectively.

If the RWQCB requires it, all surface water runoff during and after construction will need to be controlled in accordance with the requirements of the General Construction and General Industrial Storm Water NPDES permits, the requirements of Riverside County, and all other applicable laws, ordinances, regulations, and standards.

### 5.7.11 Hazardous Materials Management Plan (Supplemental Information)

A Hazardous Materials Management Plan will be developed for the facility during the detailed design phase of work and details will be added to this document when it is available.

### 5.7.12 Waste Management Plan (Supplemental Information)

This information will be added to this document during the detailed design phase of work.

### 5.7.13 Invasive Species and Noxious Weed Management Plan (Supplemental Information)

An Invasive Species and Noxious Weed Management Plan will be prepared for the MSEP. The goal of the plan is to protect the biological resources surrounding the Project area from the harmful effects of weeds and invasive species that result from Project activities and to avoid unintended harm from weed management techniques. The plan will address the following objectives:

- Identification and Risk Assessment: This objective identifies the presence, location, and abundance of weed species in the Project area for both the existing conditions and conditions expected over time.
- Suppression: This objective will ensure that populations of existing weed species do not increase due to the Project and, if possible, will be suppressed below current levels.
- Containment: This objective will strive to prevent the spread of existing weeds to new areas and prevent the introduction of weed species not currently present in the Project area.

There are two federal and two state laws setting standards for weed management. The Federal Noxious Weed Act (7 United States Code [U.S.C.] §§ 2801-2814, January 3, 1975, as amended 1988 and 1994) provides for the control and management of non-indigenous weeds that injure,

or have the potential to injure, the interests of agriculture and commerce, wildlife resources, or public health. The Plant Protection Act, as amended (7 U.S.C. 7701-7786) states that the detection, control, eradication, suppression, prevention, or retardation of the spread of plant pests or noxious weeds is necessary for the protection of the agriculture, environment, and economy of the U.S.

The California Food and Agricultural Code contains some detail on noxious weed management. Specifically, the Food and Agricultural Code Section 403 states that the Department of Food and Agriculture should prevent the introduction and spread of injurious insect or animal pests, plant diseases, and noxious weeds. The California Food and Agriculture Code Section 5101 and 5205 provide for the certification of weed-free forage, such as hay, straw, and mulch. This portion of the code recognizes that many noxious weeds are spread through forage and ground covers.

**Baseline Surveys**

All invasive plant species on the MSEP will be inventoried during the spring of 2011 biological field surveys, and concentrations of invasive species will be mapped and described. Comprehensive botanical surveys will include the requested ROW plus buffer surveys up to 600 meters surrounding the Solar Plant Site and Linear Corridor. These areas were surveyed in spring 2011 (Tetra Tech and Karl 2011).

Ten non-native species were observed in the Project area, including Sahara mustard (*Brassica tournefortii*), tamarisk (*Tamarix ramosissima*), Russian thistle (*Salsola tragus*), London rocket (*Sisymbrium irio*), puncture vine (*Tribulus terrestris*), blue panicgrass (*Panicaum antidotale*), cheeseweed (*Malva parviflora*), pigweed (*Chenopodium album*), goosefoot (*C. murale*), and Mediterranean grass (*Schismus* sp.).

**Noxious Weed Risk Assessment**

Consistent with BLM guidelines for weed management, a weed risk assessment will be conducted for each component of the Project—construction, operation, and closure—that involve soil disturbance activities and/or alteration of site vegetation. The risk assessment format will be performed for each weed species observed during spring 2011 biological field surveys. The format is online at http://www.blm.gov/ca/st/en/prog/weeds/9015.html.

**Control of Weeds**

Weed management areas will be identified including the Solar Plant Site (fence line and solar fields), Linear Facilities, and a buffer area 100 feet out from the boundary of these features.

General measures that will be used on the MSEP to limit the spread of weeds and invasive species on the site may include the following:

- Training for MSEP operators will also cover the importance of preventing the spread of noxious weeds and of controlling the proliferation of existing weeds.
- Limiting disturbance areas during construction to the minimum required to perform work.
- Limiting ingress and egress to defined routes.
- Maintaining vehicle wash and inspection stations and closely monitoring the types of materials brought on-site to minimize the potential for weed introduction.

- The contractor will ensure that any straw or hay bales used for sediment barrier installations are obtained from sources that are certified free of primary noxious weeds.
- Soil will be managed by limiting ground disturbance to the minimum feasible and implementing dust suppressants to minimize the spread of seeds. Cleared vegetation and salvaged topsoil will be stockpiled adjacent to the area from which they are stripped to eliminate the transport of soil-borne noxious weed seeds, roots, or rhizomes. During reclamation of the temporarily cleared areas, the contractor will return topsoil and vegetative material to the areas from which they were stripped.
- Dust palliatives (e.g., water) will be used during construction to minimize the spread of airborne weed seeds, especially during very windy days, a characteristic of the MSEP vicinity. As appropriate, temporary drift fences may be installed to help control sand movement during construction.
- Because Saharan mustard, Russian thistle, Mediterranean grass, and tamarisk occur either on-site or within the Project vicinity, measures will be implemented to control and suppress current weed populations from spreading and increasing in density.
- MSEP will use herbicides or mechanical weed removal techniques depending on the most appropriate method for the weed species and location.
- MSEP will utilize BLM-approved pre- and/or post-emergent herbicides. Pre-emergent herbicides will be applied to the soil before the weed seed germinates and is usually incorporated into the soil with irrigation or rainfall. Post-emergent herbicides will be applied directly to plants. Herbicides will be investigated in detail, made a part of the Weed Management Plan, and approved by BLM before use.
- Prior to beginning construction on the MSEP a complete and much more detailed Invasive Species and Noxious Weed Management Plan will be prepared and circulated to the BLM and any other interested parties for comment and approval and once complete will be implemented on the Project.

**Monitoring and Reporting**

After baseline surveys are complete, monitoring will take place each year during construction, and annually for 3 years following the completion of construction. The purpose of annual monitoring will be to determine if weed populations identified during baseline surveys have increased in density or spread as a result of Project development.

If no weed patches or statistically significant elevated weed densities are detected in the MSEP area that can be attributed to Project activities, then the Invasive Species and Noxious Weed Management Plan will be considered successful.

A report will be prepared for each annual survey evaluating the program. After 3 years of post-construction monitoring is complete, a final monitoring report will be produced to describe the outcome of weed management on the MSEP. The results of this report will be used to determine if additional monitoring or control measures are necessary.

### 5.7.14 Health and Safety Plan (Meeting OSHA Requirements) (Supplemental Information)

Two separate health and safety programs will be developed for the MSEP. During construction of the MSEP, the Applicant will provide a Health and Safety Plan for their workers. In addition, the contractor(s) working on the Project will provide a written Health and Safety Plan for their construction workers. These written safety programs and procedures will include details on heat and cold exposures, physical and chemical hazards that may be encountered, a hearing

conservation program, a respiratory protection program, fall protection procedures, hot work procedures, cranes and rigging/lifting requirements, heavy equipment procedures, and others. Fire watches may be required during hot work on-site.

An Emergency Action Plan will be developed that designates the responsibilities and actions to be taken in the event of an emergency during construction of the Project.

The second Health and Safety Plan will be developed prior to the startup of the power plant and will include an operational emergency response plan that will be used by the operators at the MSEP. A Project IIPP will be developed for the overall Project to address the health and safety issues that may be encountered during normal work activities or under unusual or emergency conditions. The IIPP will provide detailed information, and the workers will be trained about the hazards associated with the high voltage systems, inclement weather, and extreme temperatures that may occur at the site.

This information will be added to this document as it is developed during the detailed design phase of work.

### 5.7.15 Environmental Inspection and Compliance Monitoring Plan (Supplemental Information)

This information will be added to this document during the detailed design phase of work.

## 5.8 FACILITY DECOMMISSIONING (SUPPLEMENTAL INFORMATION)

### 5.8.1 Introduction to Facility Decommissioning

The MSEP presently is anticipated to have a 30 year life for solar energy production. While it is possible the use of this site for solar energy production may be extended by additions to the lease period at a future date, at the present time the Applicant has developed a conceptual decommissioning plan for the facility to return the land to the BLM. The plan is for the site to be decommissioned in a manner to return the site to conditions as close as possible to the conditions existing before construction. This will include removal of all solar panels and removal of all support equipment and site structures. It will include demolition of all foundations or other fixed structures and removal of all non-native debris to a local landfill. All roads and drainage features constructed on the site will be removed, nature drainages and topography will be restored to approximate original contour, and all areas reclaimed and/or revegetated according to a site-specific revegetation plan. To accomplish these decommissioning and reclamation objectives, the Applicant will prepare three plans as the MSEP moves forward. These plans will comply with the requirements BLM's 43 CFR 3809.550 et seq. The plans will include the following:

**Plan 1 – Temporary Use Areas Revegetation Plan:** Areas disturbed during construction, such as gen-tie construction areas, which can be reclaimed and revegetated within 1 to 2 years after disturbance will be addressed in this first revegetation plan. The plan will cover assessment of the sites to define what is there now; define the range of land reclamation and revegetation techniques applicable for each type of area; define sources for native seeds and shrubs to be planted; define cactus and native plant salvage, storage, and replanting; define weed management; and define reclamation monitoring and reporting over a 10 year period. This plan will be the first revegetation plan for the site and will change and evolve as the program develops.

**Plan 2 – Closure, Decommissioning, and Reclamation Plan:** This plan will cover removal of all industrial facilities; recycling of equipment, hazardous waste, and sampling and cleanup issues; disposal of all solid and hazardous waste; restoration of the hydrologic regime; and restoration of the approximate original contours of the site.

**Plan 3 – Solar Site Revegetation Plan:** Using information gathered and techniques identified as successful in the Temporary Use Areas Revegetation Plan, this plan will address a permanent reclamation and revegetation plan for the entire solar site to be implemented after 30 years of operation. This plan will not be required until the temporary plan is underway, and it will be developed based on experience gained in the temporary efforts and on the rapidly growing body of knowledge on desert reclamation. Timing and format for this plan will be developed with the BLM.

**Regulatory Criteria:** The site is located on land managed by the DOI, BLM, which is responsible to conduct the federal environmental review under the NEPA and to administer resulting requirements and mitigation. BLM's long-term reclamation goals for the site are to shape, stabilize, revegetate, or otherwise treat disturbed areas in order to provide a self-sustaining and productive use of the land in conformance with the land-use plan. Short-term reclamation goals are to stabilize disturbed areas and protect both disturbed and adjacent areas from unnecessary or undue degradation. The Federal Land Policy Management Act of 1976 (FLPMA) mandates that "the public lands be managed in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archeological values." In addition, FLPMA mandates that activities be conducted so as to prevent "unnecessary or undue degradation of the lands" (43 U.S.C. 1732(b)). These plans will comply with the requirements BLM's 43 CFR 3809.550 et seq.

Reclamation of disturbed land is a well-established science in the mining and construction industries in much of the U.S.; however, reclamation in desert sites such as MSEP is more difficult and the science will continue to develop in the next 30 years. Thus, the Applicant will provide the three plans defined above with the caveat that the plans will be changed in the future as better techniques for desert reclamation are perfected.

### 5.8.2 Temporary Use Areas Revegetation Plan

**Top Soil Removal and Stock Piling:** Prior to the start of construction of both temporary and permanent disturbance sites, a soil and ground cover survey will be made of the site and the areas will be staked where any topsoil is to be stripped and saved prior to construction on the site. Soil removal in the desert is shallow from 2 to 4 inches. Topsoil stockpiles are to be less than 4 feet high to prevent anaerobic conditions and shall be mulched to prevent erosion. Desert soils have been shown not to be highly amenable to top soil saving and stockpiling, especially over long periods of time such as the 30 year time frame required here. Decisions on top soil stripping and stockpiling will be made by the Applicant and the BLM prior to the beginning of construction. The temporary areas plan will further define the topsoil stripping and stockpiling protocols.

**Documentation of Existing Drainages, Approximate Original Contours, and Preexisting Conditions:** Prior to the start of construction, existing drainage information, Approximate Original Contour information, and vegetation and wildlife occurrence information will be preserved in the site plans that will be kept with the site environmental documentation for the life of the MSEP. This information will be collected during the NEPA surveys and will be kept for use in the reclamation reports.

**Plant Salvage and Collection of Native Seed and Seedlings:** Cactus, shrubs, trees, and vertical mulch (various woody materials) will be salvaged and an area and method to store the plants will be established. Compliance with the California Desert Native Plants Act will be required. The plan will address the use of qualified vendors and nurseries to collect native seeds and to grow seedlings which may be used on the site. A species list of viable plants will be prepared.

**Revegetation Plans:** All aspects of revegetation will be addressed in the plan including planting methods, ground treatments, erosion control, fertilization, monitoring and assessment of the reclamation over 1 year, weed control, herbivore protection of plantings, irrigation, and standards for success of the revegetation (Karl and Tetra Tech 2010).

### 5.8.3 Implementation of the Closure, Decommissioning, and Reclamation Plan

**Removal of all Chemicals:** A first step once the power facility is shut off will be to remove all chemicals, fuels, oils, transformers, and other potential hazards chemicals and wastes from the site. These will be disposed of in accordance with state and federal laws. Any areas of known spills will be excavated and contaminated soils also removed. Details of these activities will be detailed in a future plan.

**Hazardous Materials Business Plan:** If required, a closure plan will be filed with the Riverside County Fire Department detailing procedures for closure of the facility's Hazardous Materials Business Plan, including removal of hazardous substances from the site, their handling during removal, their ultimate disposition, and any required confirmation soil sampling.

**Removal of Equipment:** In general, MSEP decommissioning will include the removal of all improvements within 3 feet of final grade in preparation for restoration of the lines and grades in the disturbed areas to match the natural gradients outside of the disturbed areas (which will be conducted as part of the Reclamation Plan). All equipment will be recycled to the extent possible through vendors in the recycling industry.

The proposed implementation strategy to achieve the goals for MSEP decommissioning is as follows:

- Use industry standard demolition means and methods to decrease personnel and environmental safety exposures by minimizing time and keeping personnel from close proximity to actual demolition activities to the extent practical.
- The final decommissioning plan will specify in detail how each major effort will be performed and integrated to achieve the Project goals.
- Train field personnel for decommissioning actions to be taken in proportion to the personnel, Project or environmental risk for those actions.
- Document implementation of the plan and compliance with environmental requirements. The decommissioning plan for the site facilities consists of the following major elements:
  - Conducting pre-decommissioning planning activities such as preparing the final decommissioning and restoration plans and schedules that address the "as-found" site conditions at the start of the Project.
  - Demolition of the aboveground structures (dismantling and removal of improvements and materials) in a phased approach while still using some items until close to the end of the Project. For instance, the water supply, administrative

building, and some electrical power components will be modified to be used until very late in the decommissioning work.

- Demolition and removal of belowground facilities (floor slabs, footings, and underground utilities) as needed to meet the decommissioning goals.
- Soils cleanup, if needed, with special attention applied to areas where soils could have been contaminated to facilitate clean closure.

Although various types of decommissioning/demolition equipment will be used to dismantle each type of structure or equipment, dismantling will proceed according to the following general staging process. The first stage consists of dismantling and demolition of aboveground structures. The second stage consists of concrete removal as needed to ensure that no concrete structure remains within 3 feet of final grade (i.e., floor slabs, below-ground walls, and footings). The third stage consists of required testing and removal of soils, and final site contouring to return the originally disturbed area of the site to near original conditions while disturbing as little of the other site areas as is practical. This will be covered in the Reclamation Plan.

**Re-contouring, Erosion, and Sediment Control:** Re-contouring of the site will be conducted using standard grading equipment to return the land to approximately match the pre-construction surface conditions and the surrounding alluvial fan grade and function. The original site drainage features will be restored where they have been substantially modified. Since many areas of the natural drainage pattern consist of surface flow features, these areas will not be regarded. Grading activities will be limited to previously disturbed areas that require re-contouring. Efforts will be made to disturb as little of the natural drainage and vegetation as possible. Concrete rubble, crushed to approximately 2-inches in diameter or less in size (2-inch minus), will be placed in the lower portions of fills, at depths at least 3 feet below final grade. Fills will be compacted to approximately 85 percent relative compaction by wheel or track rolling to avoid over-compaction of the soils. To the extent feasible, efforts will be made to place a layer of coarser materials at the ground surface to add stability. Site preparation in general and soil development prior to planting can optimize the site conditions for establishment of the native plant community and minimization of effects of erosion (i.e., sediment loss and water runoff). Natural, overall drainage and specific drainage for arboreal washes will be restored to the original condition by re-contouring disturbed areas. Erosion and sediment control will be monitored during closure activities. Temporary erosion and sediment control measures may be necessary such as applying mulch or soil stabilizers as needed. A cost estimate for the closure efforts and financial assurance mechanisms will be provided in the plan (Worley Parsons 2010).

### 5.8.4 Solar Site Revegetation Plan

The Solar Site Revegetation Plan will meet the requirements of 43 CFR 3809.550. It will be prepared after the Temporary Use Areas Revegetation Plan has been implemented so that lessons learned from that effort can be incorporated into the overall plan for the entire BLM lease area. It shall be implemented upon closure of the MSEP and shall be subject to BLM, USFWS, and CDFG review.

The plan will include a cost estimate for implementation in accordance with 43 CFR 2805.12 and 3809.50-599. Goals of the plan will be to restore site topography and hydrology to a relatively natural condition. The plan will address the restoration of native plant communities. It will include a schedule and milestones for the revegetation efforts. It will include criteria for measuring success of revegetation such as 30 percent plant cover and 30 percent survivorship

of transplanted plants. It will cover the re-establishment of perennials and criteria for the success of this. It will include triggers for remedial action if the revegetation efforts are not meeting their goals. The plan will also have at least a 10 year monitoring period (CEC 2010).

# 6.0 MAPS AND DRAWINGS

## 6.1 MAPS WITH FOOTPRINT OF SOLAR FACILITY (7.5 MINUTE TOPOGRAPHIC MAPS OR EQUIVALENT TO INCLUDE REFERENCES TO PUBLIC LAND SURVEY SYSTEM)

The overall Solar Plant Site layout is shown on Figure 1-5. The location maps are based on the USGS 7.5 minute Topographic maps and the Public Land Survey System.

## 6.2 INITIAL DESIGN DRAWINGS OF SOLAR FACILITY LAYOUT AND INSTALLATION, ELECTRICAL FACILITIES, AND ANCILLARY FACILITIES

These initial design drawings constitute what is believed to provide a 30 percent engineering and design package for the layout and facilities. The package of drawings adequately describes the proposed Project and evaluates the design considerations for soils, drainage, and watershed management.

### 6.2.1 Solar Facility Layout Drawing

A preliminary site layout is shown in Figure 1-5, along with the typical ancillary facilities associated with the solar field. The fence details are shown on Figure 6-1.

### 6.2.2 Preliminary Hydrology Evaluation

A preliminary hydrology/hydraulic assessment was performed to evaluate site hydrologic conditions in the vicinity of the proposed Solar Plant Site and provide a preliminary design basis for on-site drainage, and the several unnamed washes that drain from the McCoy Mountains west of the Solar Plant Site. The evaluation was based on the guidance provided in the RCFC&WCD Riverside County Hydrology Manual and regional USGS regression equations.

RCFC&WCD recommends two primary methods for general hydrologic analysis to determine design discharges as the Rational method and the Synthetic Unit Hydrograph method. The Rational method is generally intended for use on small watersheds of less than 300 to 500 acres while the Synthetic Unit Hydrograph method (NRCS) method) is intended for use on watersheds in excess of these limits. HEC-HMS hydrologic modeling software package was used to employ the NRCS method. The primary input variables for the NRCS method are precipitation, storm distribution, curve number, basin delineation or area, and time of concentration or lag time. The NRCS method utilized by HEC-HMS employs these parameters to develop a specific basin's relationship between runoff versus time and estimate basin's peak flow rate that is subsequently used for the preliminary design of its storm water conveyance channel. In addition to HEC-HMS, USGS regional regression equations were used to estimate existing flows from the McCoy Wash. The preliminary assessment summary of the run-on drainage pattern and existing hydrology with 100-year storm event peak flow is shown in the Pre- and Post-Development Hydrology Report (AECOM 2011a).

The storm water flow that will traverse the planned Solar Plant Site footprint originates in the McCoy Mountains southwest and west of the site, with sheet flow drainage collecting in rills and gullies. The existing ground elevations generally decrease from west to east and south to north, resulting in an initial drainage towards the northeast and southeast, away from the mountainous

area. The drainage gradually shifts towards the east and south as it moves farther away from the McCoy Mountains.

On-site run-on to the location of the proposed solar fields follows natural grade to the southeastern direction. Minimal grading within the solar field is expected to be required to allow access to the solar arrays. This will maintain the on-site runoff close to the existing conditions.

The site will be mainly occupied by the rows of trackers that are elevated above the ground and thus the ground below the collectors will remain largely as a pervious surface. The portions of the Solar Plant Site that will be impervious are the plant substation, the O&M Building, the access road, and the parking lots associated with these areas. The small increases in the storm water discharges resulting from impervious areas created by the MSEP will be mitigated by implementing storm water management BMPs such that the resultant drainage from the MSEP will be relatively unaffected by the proposed improvements. The proposed drainage modifications to this Solar Plant Site are intended to replicate the existing flow patterns as closely as possible for the drainages as they exit the site. The proposed solar field improvements are not anticipated to noticeably change the existing upstream off-site drainage patterns.

### 6.2.3 Preliminary Stormwater Management and Control

The preliminary storm water drainage for the Solar Plant Site, is designed to maintain predevelopment hydraulic conditions in the natural watercourses and to minimize the generation of non-point source pollutants. The concept employed for the design and layout of the solar arrays is to minimize the placement of the arrays in large, established channels (to the extent practical) and utilize equipment and protective measures that will allow the existing drainage patterns to be maintained where possible.

Storm water originating in the McCoy Mountains near the southeastern edge of the Solar Plant Site moves towards the east and the southern half of the Solar Plant Site, as shown by the topographic contours. Minimal grading within the solar field is expected to be required to allow access to the solar arrays. This will maintain the on-site runoff close to the existing conditions.

The tracker equipment currently available is designed to mount on strong steel supports and may be designed and installed to minimize the impact of storm water flow on the equipment. Therefore, although the details of the storm water drainage will be evaluated in the detailed engineering design, the preliminary approach is to maintain the natural flows where possible. Electrical components within the solar arrays, such as inverters, will be placed out of main drainage channels and weather/water proofed to the extent possible.

The Project substation on the north end corner of the solar plant is anticipated to be elevated from the existing grade for protection.

## 6.3 INITIAL SITE GRADING PLAN

Based on the site topography and the ability to adjust the height of the trackers for variations in terrain, the preliminary design for the solar arrays does not include any large scale grading within the arrays. Localized grading will be required to address gullies or areas that present physical problems for access.

## 6.4 MAPS WITH TRANSMISSION FACILITIES, SUBSTATIONS, DISTRIBUTION, AND COMMUNICATIONS

The gen-tie routes are shown in Figure 1-4 as they proceed from the MSEP south to the CRS, south of I-10. The location of the MSEP substation is shown on Figure 1-5. Required communication lines will be routed on the same towers as the transmission lines.

## 6.5 ACCESS AND TRANSPORTATION MAPS

The Solar Plant Site can be accessed from the Mesa Drive/Airport exit from the I-10 by heading west onto Black Rock Road. Approximately 1.5 miles west of Mesa Drive along Black Rock Road, a four-wheel-drive trail named Black Creek Road extends north towards the Solar Plant Site. As part of the Solar Millennium BSPP, it is anticipated that BSPP will install an improved access road from Black Creek Road to the southern edge of the BSPP. The MSEP will use this same access road up to where the MSEP gen-tie lines cross the BSPP access road, after which a new access road will be constructed around the eastern side of the BSPP (see Figure 1-2).This access route will be used by the construction contractor's workforce and trucks carrying materials and supplies for the construction and operation of MSEP.

# 7.0 REFERENCES

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# FIGURES

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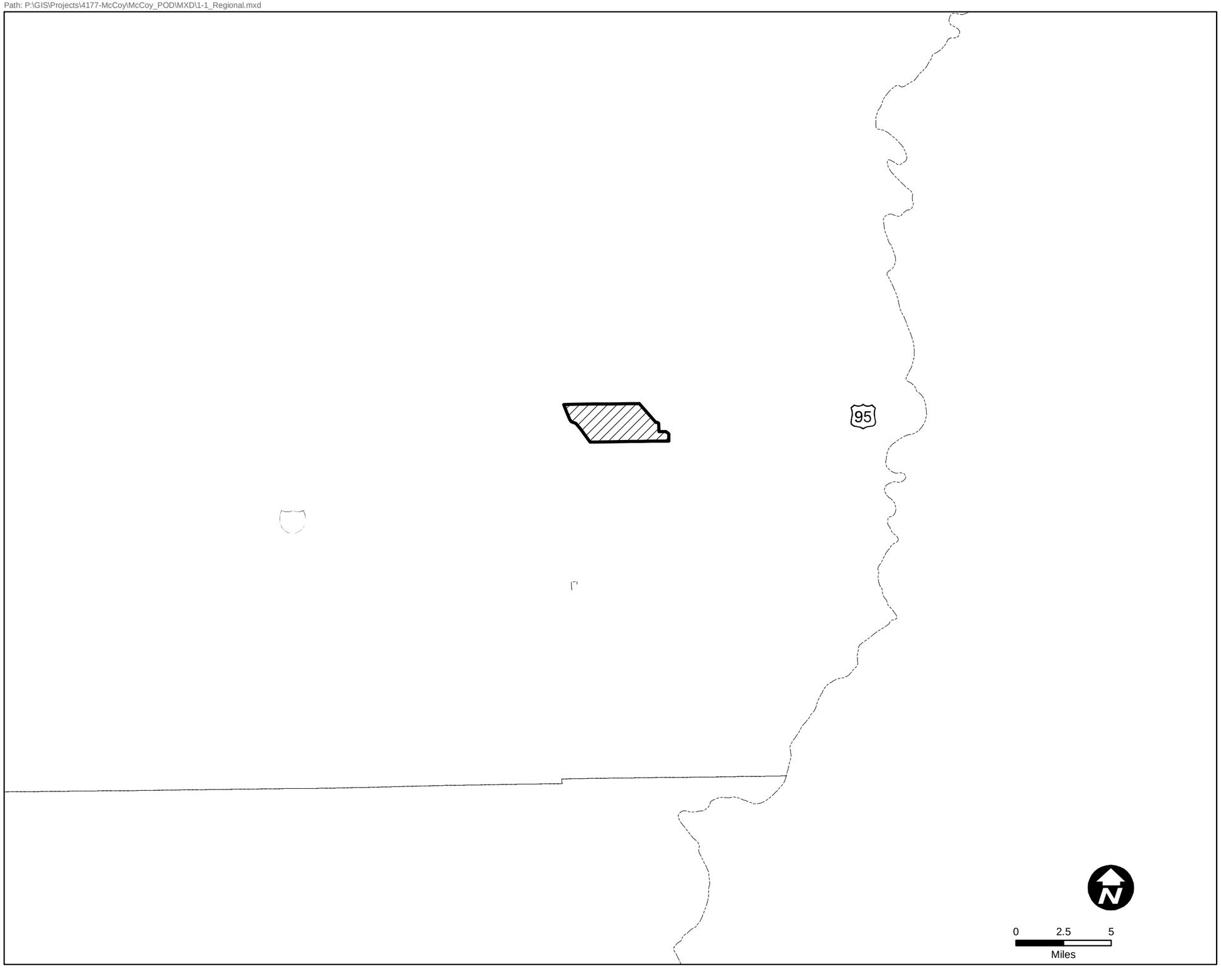


# McCOY SOLAR ENERGY PROJECT RIVERSIDE COUNTY, CA

PROJECT LOCATION

1 in = 363 miles

**Legend**

- MSEP Solar Plant Site Boundary
- Blythe Solar Power Project
- Proposed Gen-Tie Line
- Proposed Distribution Line
- Proposed SCE Colorado River Substation
- Proposed Switchyard

Notes:
(a) UTM Zone 11, NAD 1983 Projection.
(b) Source data: ESRI, BLM, USGS, TTEC

FIGURE 1-1
PROJECT LOCATION MAP

TETRA TECH EC, INC.

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# McCOY SOLAR ENERGY PROJECT RIVERSIDE COUNTY, CA

PROJECT LOCATION

1 in = 363 miles

## Legend

**Project Features**

- MSEP BLM ROW Grant Application Boundary
- MSEP Solar Plant Site Boundary
- Blythe Solar Power Project
- Proposed Gen-Tie Line
- Proposed Distribution Line
- New 24' wide Paved Road to MSEP
- Shared Access Road with BSPP
- Proposed Switchyard
- Proposed SCE Colorado River Substation
- Big Horn Sheep WHMA

**Land Jurisdiction**

- Bureau of Land Management
- State

0 2,750 5,500 11,000
Feet

Notes:
(a) UTM Zone 11, NAD 1983 Projection.
(b) Source data: ESRI, BLM, USGS 7.5' DRGs, TTEC

FIGURE 1-2
PROJECT DESCRIPTION MAP

TETRA TECH EC, INC.

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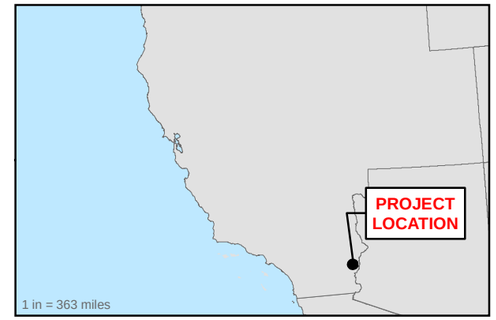
# McCOY SOLAR ENERGY PROJECT RIVERSIDE COUNTY, CA




**Legend**

- MSEP Solar Plant Site Boundary
- Blythe Solar Power Project
- Proposed Gen-Tie Line
- Proposed Distribution Line
- New 24' wide Paved Road to MSEP
- Shared Access Road with BSPP

**Land Jurisdiction**

- Bureau of Land Management
- State

0 2,000 4,000 8,000
Feet

Notes:
(a) UTM Zone 11, NAD 1983 Projection.
(b) Source data: ESRI, BLM, USGS 7.5' DRGs, TTEC

FIGURE 1-3
PROJECT SITE LOCATION AND LAND OWNERSHIP

TETRA TECH EC, INC.

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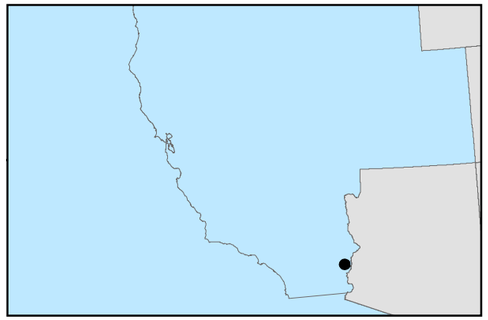


**Legend**

- MSEP Solar Plant Site Boundary
- Blythe Solar Power Project
- Proposed Gen-Tie Line
- Proposed Distribution Line
- New 24' wide Paved Road to MSEP
- Shared Access Road with BSPP
- Proposed Switchyard
- Proposed SCE Colorado River Substation

**Public Land Survey System**

- Township/Range
- Sections

**Land Jurisdiction**

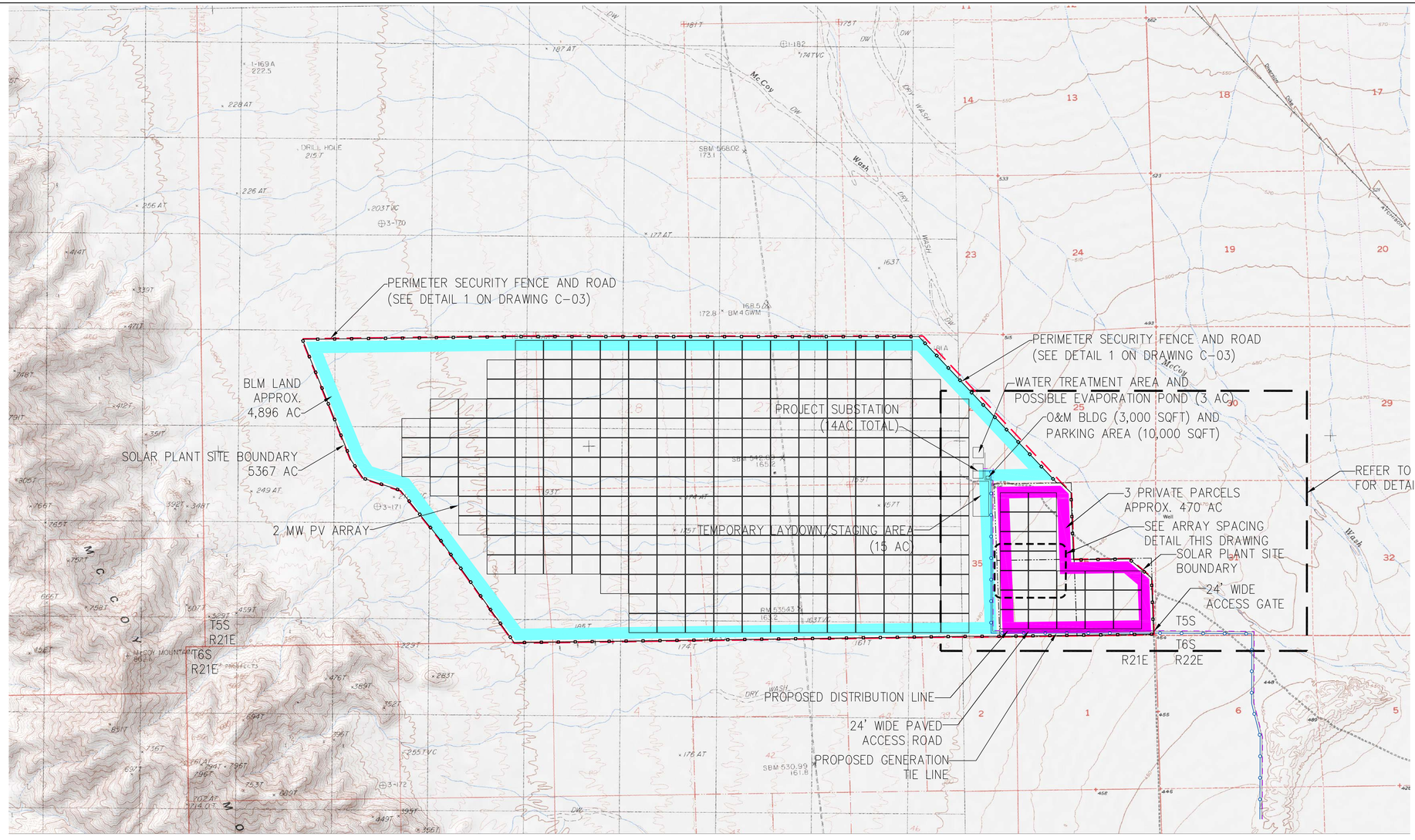
- Bureau of Land Management
- State

0 2,000 4,000
Feet

Notes:
(a) UTM Zone 11, NAD 1983 Projection.
(b) Source data: ESRI, BLM, USGS 7.5' DRG, TTEC

FIGURE 1-4
TRANSMISSION SYSTEM AND LAND OWNERSHIP

TETRA TECH EC, INC.




***ARRAY SPACING DETAIL***
NOT TO SCALE

## *LEGEND:*

| | |
|---|---|
| AC | ACRES |
| MW | MEGAWATTS |
| SQFT | SQUARE FEET |
| TYP | TYPICAL |
| R21E | RANGE 21 EAST, |
| T5S | TOWNSHIP 5 SOUTH |
| | 2 MW PV ARRAY |
| | EXTENT OF PROJECT ON BLM LAND |
| | EXTENT OF PROJECT ON PRIVATE LAND |
| | PERIMETER FENCE AND ROAD |
| | PROPOSED GENERATION TIE LINE |
| | PROPOSED DISTRIBUTION LINE |
| | SOLAR PLANT SITE BOUNDARY |
| | PAVED ACCESS ROAD |

1"=2000'
2000 0 2000 4000
SCALE IN FEET

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| A | 5/17/11 | INITIAL ISSUE | WS | JAD |

REGISTERED PROFESSIONAL ENGINEER
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No.C54558
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McCOY SOLAR ENERGY PROJECT
*RIVERSIDE COUNTY, CALIFORNIA*

*FIGURE 1-5 SOLAR PLANT SITE DELINEATION PLAN*

C-01
SHEET 2 OF 4 SHEETS

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WATER TREATMENT AREA AND POSSIBLE EVAPORATION POND (3 AC)

PROJECT SUBSTATION (14 AC TOTAL)

TEMPORARY LAYDOWN AREA (APPROX. 15 AC) (NOTE 4)

O&M BUILDING (3,000 SQ.FT.) AND PARKING AREA (10,000 SQ.FT.)

(500') (NOTE 3)

(490')

(480')

(470')

(460')

(450')

120'

PARCEL BOUNDARY BETWEEN BLM AND PRIVATE LANDS

2316'

327'

PARCEL AREA EXCLUDED FROM SOLAR PLANT SITE (APPROX. 1.3 AC)

333'

SOLAR PLANT SITE BOUNDARY (SEE DETAIL 1 ON DRAWING C-03)

8' PERIMETER SECURITY FENCE WITH 3-STRAND BARBED WIRE (TYP.) (SEE DETAIL 2 ON DRAWING C-03)

APN – 812130008 (APPROX. 157.6 AC)

2288'

PARCEL BOUNDARIES

BLM LAND

PRIVATE LAND

1893'

751'

PARCEL BOUNDARY

PARCEL AREA EXCLUDED FROM SOLAR PLANT SITE (APPROX. 5.7 AC)

999'

20' WIDE INTERNAL ACCESS ROADS (TYP.)

PARCEL BOUNDARY

APN – 812130007 (APPROX. 158.8 AC)

APN – 812130006 (APPROX. 153.3 AC)

2 MW PV ARRAY (SEE DETAIL 1 THIS DRAWING) (TYP. OF 23 ON PRIVATE PROPERTIES)

1959'

24' WIDE PAVED ACCESS ROAD

24' WIDE ACCESS GATE (NOTE 1)

PROPOSED DISTRIBUTION POWERLINE TO SOLAR PLANT

REFER TO DRAWING C-01 FOR EXTENT OF SOLAR PLANT ON BLM LAND

5281'

24' WIDE PAVED ACCESS ROAD TO BLYTHE SOLAR PLANT ACCESS ROAD (NOTE 2)

PROPOSED GENERATION TIE LINE

2 MW PV ARRAY (SEE DETAIL 1 THIS DRAWING FOR TYPICAL)

PARCEL BOUNDARY BETWEEN BLM AND PRIVATE LANDS

BLYTHE SOLAR POWER PLANT SITE

INVERTERS AND PARKING AREA (TYP) (SEE DETAIL 1 THIS DRAWING)

SEE SECTION DETAIL ON DRAWING C-03

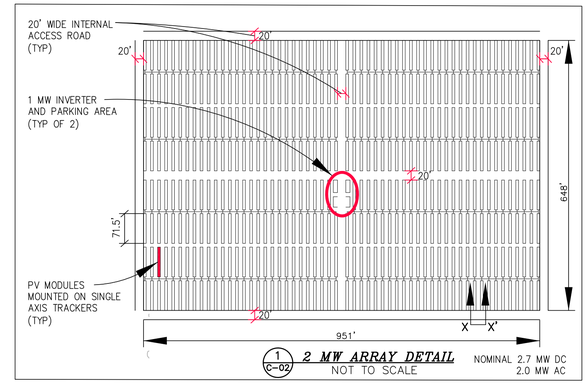
A

A

500 0 500 1,000

1"=500'

SCALE IN FEET




1 C-02 **2 MW ARRAY DETAIL** NOMINAL 2.7 MW DC 2.0 MW AC
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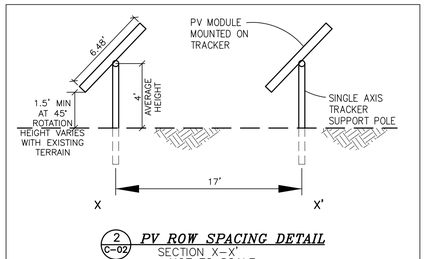


2 C-02 **PV ROW SPACING DETAIL** SECTION X-X'
NOT TO SCALE

## LEGEND:

| | |
|---|---|
| AC | ACRES |
| APN | ASSESSOR'S PARCEL NUMBER |
| MW | MEGAWATTS |
| PV | PHOTOVOLTAIC |
| SQFT | SQUARE FEET |
| | 2 MW PV ARRAY |
| | PERIMETER FENCE AND ROAD |
| | PROPOSED GENERATION TIE LINE |
| | PROPOSED DISTRIBUTION LINE |
| | SOLAR PLANT SITE BOUNDARY |
| | PAVED ACCESS ROAD |
| | PARCEL BOUNDARY |
| (450') | SURFACE ELEVATION CONTOUR |

## NOTES:

1. CONTROLLED ACCESS GATE WILL PROVIDE FULL WIDTH ACCESS. FIRE DEPARTMENT LOCK BOX WILL BE PROVIDED AT THE GATE TO ALLOW EMERGENCY ACCESS.
2. SITE ACCESS IS FROM MESA DRIVE/AIRPORT EXIT FROM I-10, WEST ON BLACK ROCK ROAD TO BLYTHE SOLAR POWER PLANT PROJECT ACCESS ROAD. NEW 24' WIDE ACCESS ROAD TO BE CONSTRUCTED ON BLM LAND FROM BLYTHE SOLAR POWER PROJECT ACCESS ROAD TO SOLAR PLANT SITE.
3. DRAINAGE ACROSS SITE IS CURRENTLY FROM THE NORTHWEST TOWARDS THE SOUTHEAST, AS SHOWN ON THE SURFACE CONTOURS. A HYDROLOGY EVALUATION IS UNDER WAY FOR THE PROJECT. CONTOURS ARE BASED ON DIGITAL TERRAIN MODEL DATA COLLECTED IN 2005 USING AIRBORNE INTERFEROMETRIC SYNTHETIC APERTURE RADAR (INTERMAP TECHNOLOGIES).
4. TEMPORARY LAYDOWN AREA PROVIDED ON BLM LAND WILL SERVE AS LOCATION FOR CONSTRUCTION TRAILERS, PARKING AND EQUIPMENT STAGING AREAS. THIS WILL PROVIDE AMPLE SPACE FOR VEHICLE TURN AROUND.

C-02

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| A | 5/17/11 | INITIAL ISSUE | WS | JAD |

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*RIVERSIDE COUNTY, CALIFORNIA*

*FIGURE 1-6 DETAILED SITE PLAN*

SHEET 3 OF 4 SHEETS

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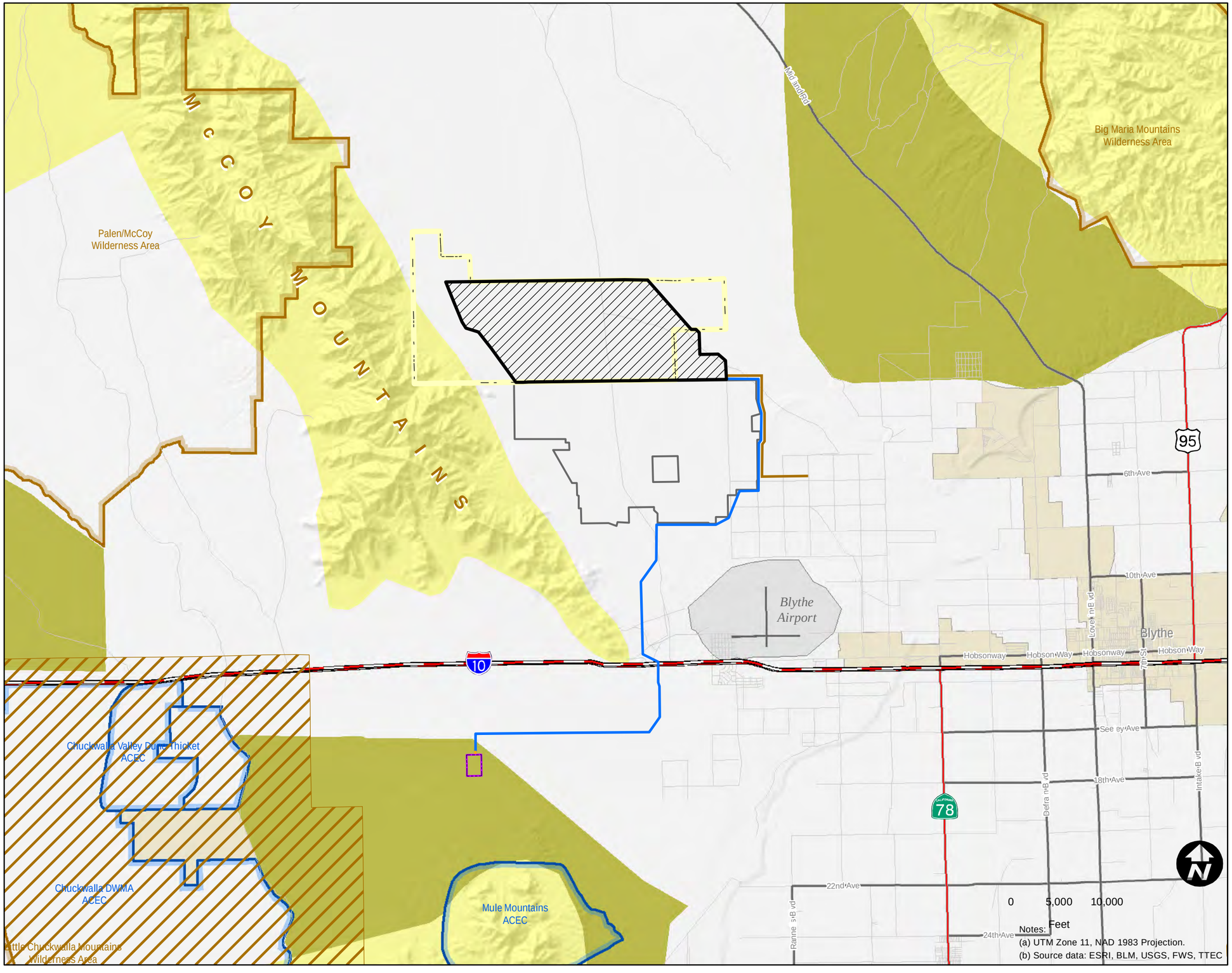
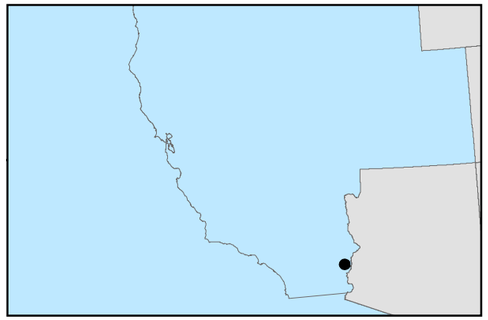



Notes:
(a) UTM Zone 11, NAD 1983 Projection.
(b) Source data: ESRI, BLM, USGS, FWS, TTEC

# McCOY SOLAR ENERGY PROJECT RIVERSIDE COUNTY, CA



## Legend

**Project Features**

- MSEP BLM ROW Grant Application Boundary
- MSEP Solar Plant Site Boundary
- Blythe Solar Power Project
- Proposed Gen-Tie Line
- Proposed Distribution Line
- Proposed Switchyard
- Proposed SCE Colorado River Substation

**Special Management Areas**

- Desert Tortoise Critical Habitat (FWS)
- Multi Species WHMA
- Big Horn Sheep WHMA
- Area of Critical Environmental Concern
- Wilderness Area

FIGURE 5-1
SPECIAL MANAGEMENT AREAS
WITHIN PROJECT VICINITY

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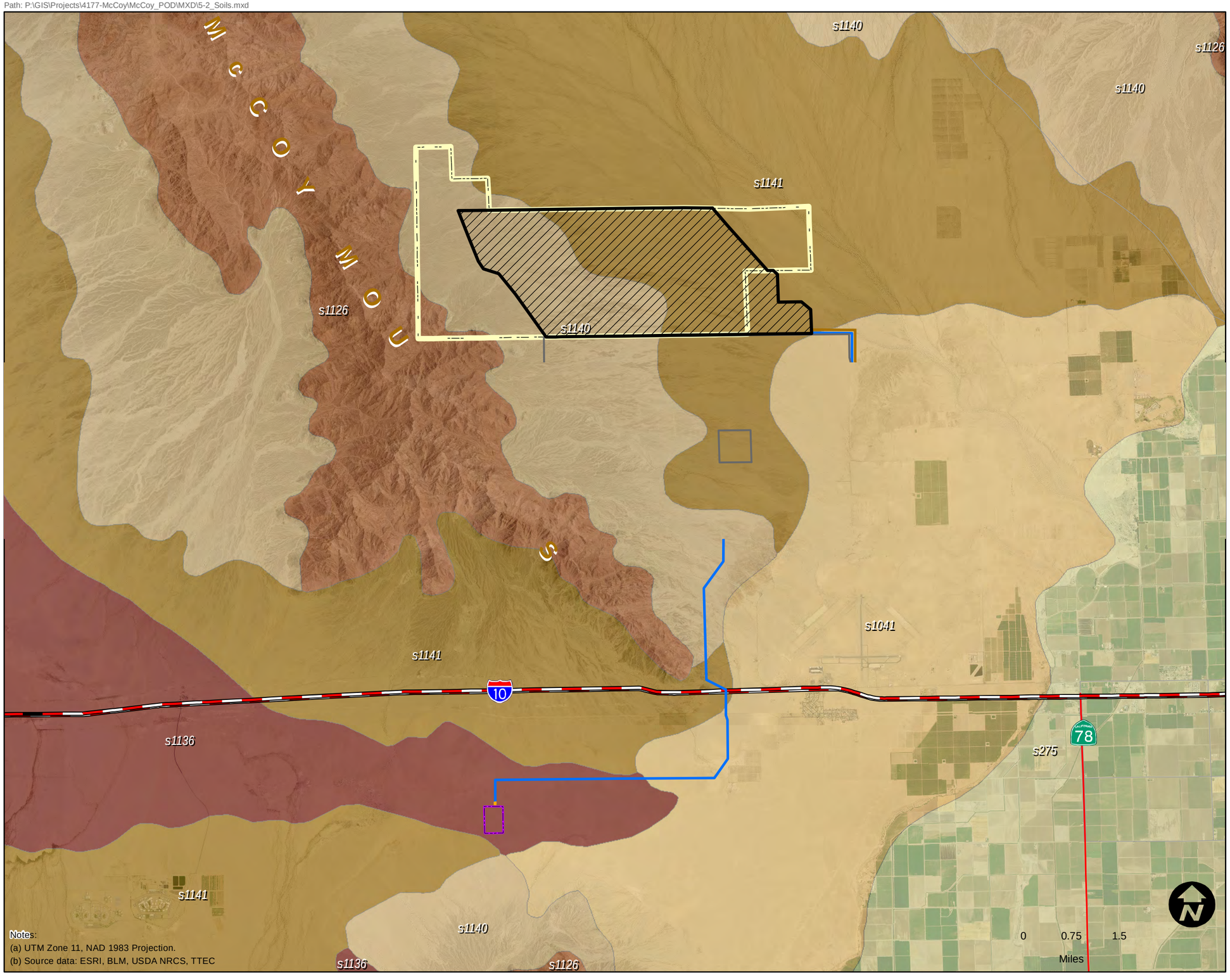


Notes:
(a) UTM Zone 11, NAD 1983 Projection.
(b) Source data: ESRI, BLM, USDA NRCS, TTEC

# McCOY SOLAR ENERGY PROJECT RIVERSIDE COUNTY, CA

PROJECT LOCATION

1 in = 363 miles

**Legend**

- MSEP BLM ROW Grant Application Boundary
- MSEP Solar Plant Site Boundary
- Blythe Solar Power Project
- Proposed Gen-Tie Line
- Proposed Distribution Line
- Proposed Switchyard
- Proposed SCE Colorado River Substation

**Soil Designations**

- s1041 Rositas-Carrizo
- s1126 Rock Outcrop-Tecopa Lithic Torriorthents
- s1136 Rositas Carsitas-Dune Land
- s1140 Gunsight-Rillito-Chuckawallen
- s1141 Cherion-Hyder-Cipriano
- s275 Gilman-Rositas-Indio

FIGURE 5-2
REGIONAL SOILS

TETRA TECH EC, INC.

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# McCOY SOLAR ENERGY PROJECT RIVERSIDE COUNTY, CA

PROJECT LOCATION

1 in = 363 miles

**Legend**

- MSEP BLM ROW Grant Application Boundary
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- Proposed Gen-Tie Line
- Proposed Distribution Line
- Proposed Switchyard
- Proposed SCE Colorado River Substation

**Regional Geology**

- Q Quaternary Sediments
- I Igneous
- S Sedimentary
- M Metamorphic

**Peak Acceleration (%g) with 20% Probability of Exceedance in 50 Years**

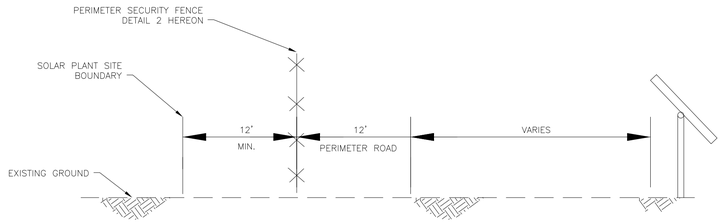
- 10-15
- 9-10
- 8-9
- 7-8

Notes:
(a) UTM Zone 11, NAD 1983 Projection.
(b) Source data: ESRI, BLM, USGS, MEC

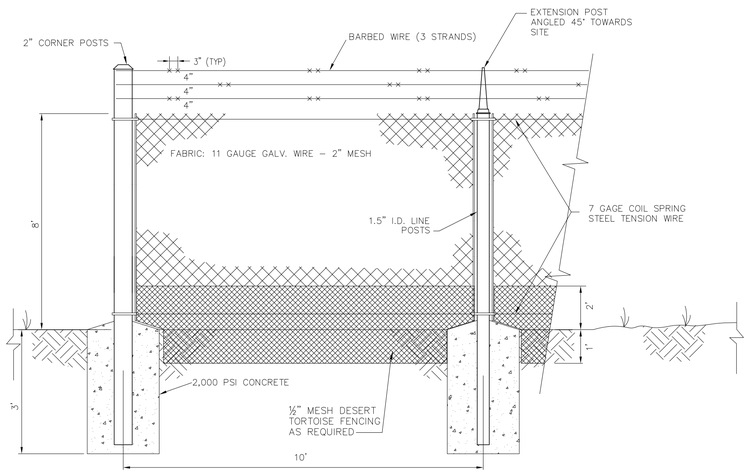
0 1 2 Miles

FIGURE 5-3
REGIONAL GEOLOGY

TETRA TECH EC, INC.

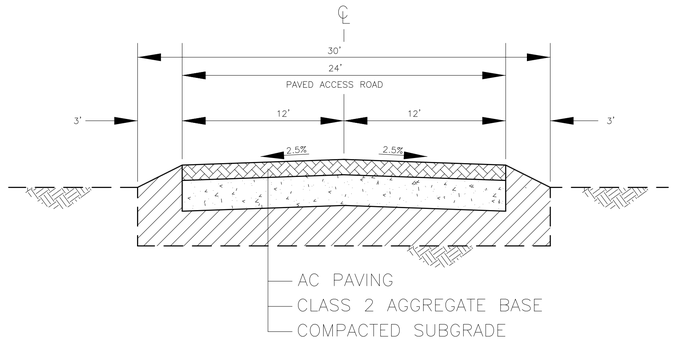



1 C-03 **TYPICAL PERIMETER ROAD & SECURITY FENCE MAINTENANCE ROAD**
N.T.S.



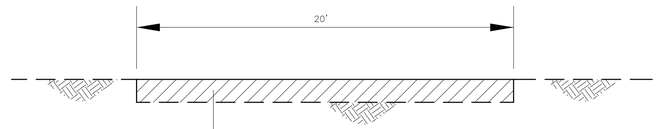

NOTE:
1. MAINTENANCE GATES AT 1000' INTERVALS ALONG FENCE.
2. FIRE DEPARTMENT ACCESS DEVICE AND EMERGENCY CONTACT PLACARD TO BE LOCATED AT MAIN ACCESS GATE.
3. SITE IDENTIFICATION PLACARD APPROX. 15"x15" WITH COMPANY IDENTIFICATION AND CONTACT INFORMATION TO BE LOCATED AT INTERVALS OF 300' ALONG FENCE.

2 C-03 **PERIMETER SECURITY FENCE**
N.T.S.



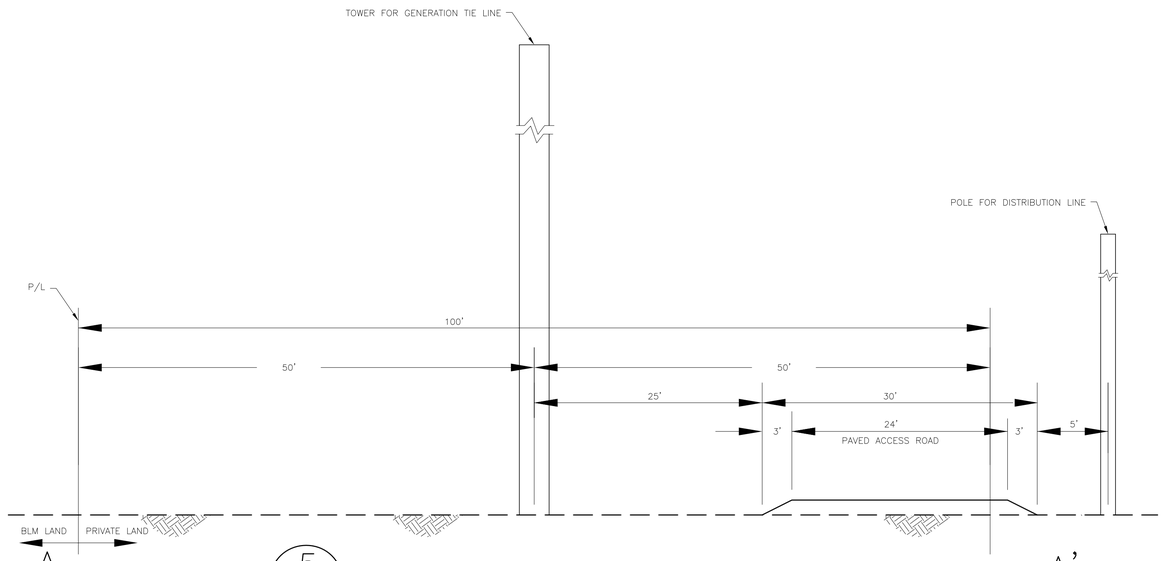

THICKNESS OF EACH LAYER TO BE DETERMINED BASED ON GEOTECHNICAL ANALYSIS AND LOADS (N.T.S.)

3 C-03 **24' WIDE ACCESS ROAD SECTION**
N.T.S.




20' WIDE INTERNAL ROAD:
TO BE SCARIFIED, MOISTURE CONDITIONED AND COMPACTED. THICKNESS AND MAXIMUM DENSITY TO BE IDENTIFIED IN GEOTECHNICAL DESIGN/REPORT.

4 C-03 **INTERNAL ACCESS ROAD SECTION**
N.T.S.




5 C-03 **GENERATION TIE LINE RIGHT-OF-WAY SECTION A-A'**
N.T.S.

C-03

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McCOY SOLAR ENERGY PROJECT
*RIVERSIDE COUNTY, CALIFORNIA*

*FIGURE 6-1*
*DETAILS AND TYPICAL SECTIONS*

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# APPENDIX A

# McCOY SOLAR ENERGY PROJECT DRAFT PRE- AND POST-DEVELOPMENT HYDROLOGY REPORT

AECOM

# McCoy Solar Energy Project

# Pre- and Post-Development Hydrology Report

August 4, 2011

DRAFT REPORT

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## EXECUTIVE SUMMARY

***Note to Reader:*** *This draft report constitutes only the pre development condition analysis at this time. The results of post development conditions in this report are currently noted as "TBD" and will be incorporated for comparison to pre development conditions subsequent to preliminary post development design layout, which is currently in progress.*

This report provides results (HEC-HMS and FLO-2D hydrology/hydraulics modeling) for pre- and post-development drainage conditions at the McCoy Solar Energy Project (MSEP) solar plant site utilizing topographic site data, precipitation information, and two-dimensional unconfined flow modeling.

Appendices A and B include site maps of the McCoy site (associated with the 10-year and 100-year storm events, respectively) of pre- and post-development simulated maximum flow depth, maximum velocity, and maximum water surface elevation.

Figure ES-1 is a site map showing the MSEP solar plant site boundary, drainage model boundaries, and "Flow Analysis Cross Sections".

Tables 1 and 2 below provide a summary of peak flow rate (CFS) and total flow volume (AF) at six Flow Analysis Cross Sections, shown in Figure ES-1, intended to describe flows entering (sections 3-6) and exiting (sections 1 and 2) the MSEP solar plant site. The peak flow in CFS represents the instantaneous peak flow across the section, and the volume in AF summarizes the total flow across the section during the storm event and receding hydrograph.

The Flow Analysis Cross Section locations associated with pre-development flows are utilized as flow measurement locations to compare pre- and post-development site drainage conditions. This comparison, or "delta", will help guide proposed site design to minimize the delta between pre- and post-development site drainage discharges.

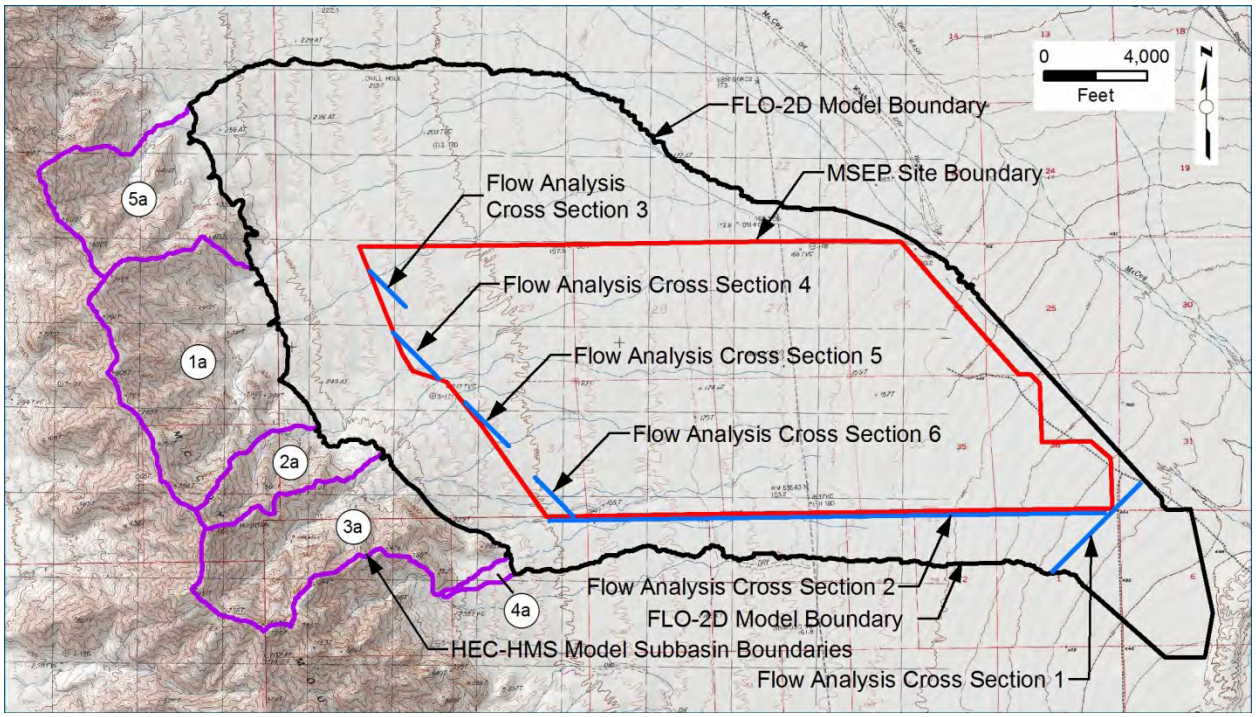


**Figure ES-1: MSEP Solar Plant Site Boundary, Model Boundaries, and Flow Analysis Cross Sections**

**TABLE 1**
**PRE- and POST-DEVELOPMENT FLO2D RESULTS**
**10-Year Storm Event**

| | Pre-Development | | Post-Development | |
|---|---|---|---|---|
| Flow Analysis Cross Section | Peak Flow Rate (CFS) | Total Flow Volume (AF) | Peak Flow Rate (CFS) | Total Flow Volume (AF) |
| 1 | 165 | 333 | TBD | TBD |
| 2 | 441 | 332 | TBD | TBD |
| 3 | 85 | 18 | TBD | TBD |
| 4 | 329 | 50 | TBD | TBD |
| 5 | 154 | 30 | TBD | TBD |
| 6 | 270 | 36 | TBD | TBD |

**TABLE 2**
**PRE-and POST-DEVELOPMENT FLO2D RESULTS**
**100-Year Storm Event**

| | Pre-Development | | Post-Development | |
|---|---|---|---|---|
| Flow Analysis Cross Section | Peak Flow Rate (CFS) | Total Flow Volume (AF) | Peak Flow Rate (CFS) | Total Flow Volume (AF) |
| 1 | 979 | 1031 | TBD | TBD |
| 2 | 1308 | 939 | TBD | TBD |
| 3 | 323 | 50 | TBD | TBD |
| 4 | 1051 | 143 | TBD | TBD |
| 5 | 660 | 84 | TBD | TBD |
| 6 | 687 | 91 | TBD | TBD |

A summary discussion of the changes between pre- and post-development condition peak flow rate and total volume at the defined cross sections will be completed when post development condition information is available.

## GLOSSARY OF TERMS

The following glossary provides brief definitions of technical terms used throughout this report.

**Project Name:** McCoy Solar Energy Project (MSEP).

**Applicant:** McCoy Solar, LLC (a subsidiary of NextEra Energy Resources, LLC).

**Bureau of Land Management (BLM):** Administers the land on which the MSEP is located. Includes the MSEP BLM Right-of-Way Grant Application Boundary (ROW Boundary), which is larger than the included MSEP Solar Plant Site Boundary.

**Drainage Basin:** Extent of land where water from rain or snow-melt drains by gravity into a body of water (e.g., river, lake, reservoir, estuary, wetland, sea, or ocean).

**FLO-2D Model:** An integrated river/floodplain and flood routing hydrologic/hydraulic model.

**Grid Element (also Grid Cell):** Geographic space, as an array, of equally sized square grid points arranged in rows and columns. Each grid point stores a numeric value that represents a geographic attribute (such as elevation or surface slope) for that unit of space. Each grid cell is referenced by its X and Y coordinate location.

**Hydrograph:** Graph showing changes in flow rate over time.

**Hydrologic Model:** Simplified, conceptual representation of portions of the hydrologic cycle.

**Hydrology:** Study of movement, distribution, and quality of water through a system.

**Initial Abstraction:** The portion of rainfall that does not initially generate runoff due to Interception (due to vegetated cover or other man-made obstructions) and surface depressions.

**MSEP Solar Plant Site:** A subset of the MSEP ROW Application Boundary that includes all facilities that create a footprint in and around the field of solar panels, such as the solar field itself, substation, perimeter road, fencing, drainage, operations and maintenance (O&M) facilities, etc. Does not include the BLM ROW Application Boundary.

**Model Domain:** Geographic area represented by the FLO-2D model.

**Non-Uniform Flow:** Flow characterized by varying velocity with respect to distance at a given time.

**Project Vicinity:** A general term to describe the broader, surrounding area.

**Spatial Resolution:** The level of detail that can be included in the geographic representation of the model. The smaller the model grid cell size, the higher the model resolution.

**Unsteady Flow:** Flow characterized by varying velocity with respect to time at a given location.

## ABBREVIATIONS AND ACRONYMS

| | |
|---|---|
| **AF/yr** | Acre-feet per year (volume per time) |
| **AF** | Acre-feet (volume) |
| **BLM** | Bureau of Land Management |
| **CFS** | Cubic Feet per Second |
| **CN** | Curve Number |
| **FEMA** | Federal Emergency Management Agency |
| **I-10** | Interstate 10 |
| **LIDAR** | Light Detection and Ranging |
| **MSEP** | McCoy Solar Energy Project |
| **MW** | megawatt |
| **NOAA** | National Ocean and Atmospheric Administration |
| **NRCS** | Natural Resources Conservation Service |
| **PV** | Photovoltaic |
| **SCS** | Soils Conservation Survey (now NRCS) |
| **USACE** | United States Army Corps of Engineers |
| **USGS** | United States Geological Survey |

# 1. PROJECT DESCRIPTION

## 1.1 Introduction

McCoy Solar, LLC (a subsidiary of NextEra Energy Resources, LLC) proposes to locate the McCoy Solar Energy Project (MSEP) solar plant site near the City of Blythe, in Riverside County, California, on land administered by the Bureau of Land Management (BLM). McCoy Solar has filed an application with the BLM to construct the facilities needed for the photovoltaic (PV) solar technology (up to 750 MW), which includes the solar field itself (PV modules are elevated above ground by supporting steel structures and organized in rows to maximize exposure to the sun), substation, perimeter road, fencing, drainage, operations and maintenance (O&M) facilities.

Tetra Tech completed a hydrologic study (Tetra Tech, 2011) to evaluate surface water drainage characteristics at the MSEP solar plant site and project vicinity. The study included pre-development hydrologic modeling (HEC-HMS[1]) of drainage areas off-site (upslope) and through the MSEP solar plant site. The study utilized USGS 30-foot contour-interval topography and radar data (10-foot contour interval) to generate elevation data for the modeled area.

Subsequent to completion of the Tetra Tech hydrologic study, LIDAR two-foot contour-interval topography and updated precipitation information[2] were collected and used to refine the on-site hydrologic analysis for both pre- and post-development conditions. Using this updated information, a combination of two hydrologic models were used to better represent the two distinct land types of the Project Vicinity: the steeper mountainous terrain up-slope of the MSEP solar plant site (modeled with HEC-HMS), and the flatter terrain on which the MSEP solar plant site is located (modeled with FLO-2D[3]), as shown in Figure 1.

[1] U.S. Army Corps of Engineer's HEC-HMS software, version 3.5

[2] Precipitation frequency estimates in semiarid southeastern California were updated with the April 8, 2011 release of NOAA Atlas 14 Volume 6.
http://www.nws.noaa.gov/oh/hdsc/PF_documents/Atlas14_Vol1_Ver5_Addendum.pdf

[3] FLO-2D Flood Routing Model, Version 2009.06

**Figure 1: Steep Mountainous Terrain and Flat Alluvial Terrain at the Project Vicinity**

## 1.2 Site Description

The MSEP solar plant site is approximately 5,363 acres located 12 miles northwest of Blythe, California and is approximately 6 miles north of I-10, see Figure 2. The area is considered within the boundaries of the BLM, un-incorporated Riverside County, and the Sonoran Desert. Vegetation in the Sonoran Desert includes succulent cacti and drought resistant shrub (Figure 3) adapted to sparse rainfall and well-draining soil. Soils are generally made of larger, more angular, cobble stone near the mountains, and become smaller, closely packed, cobble and pebble stone in the project vicinity and at the MSEP solar plant site (Figure 4).

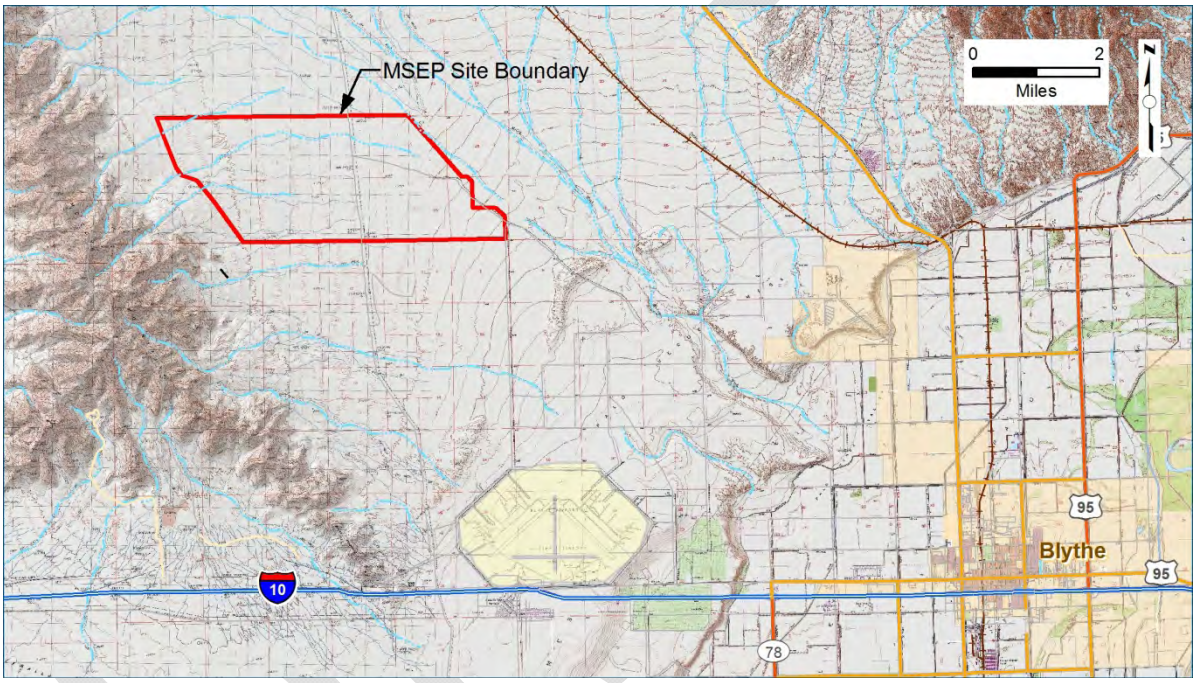


**Figure 2: MSEP Solar Plant Site and Surrounding Areas**

**Figure 3: Site Vegetation**

**Figure 4: Onsite Soils and Gravel**

## 2. METHODOLOGY

Drainage conditions at the MSEP solar plant site are modeled using LIDAR two-foot contour-interval topography[4], 24-hr precipitation data[5] (10- and 100-year return periods), and a combination of two physical process hydrologic models, HEC-HMS and FLO-2D, to route rainfall-runoff and flood hydrographs for the project vicinity and the MSEP solar plant site.

### 2.1 Spatial Configuration

A modeled area is defined by the computational boundary (the model boundary), a line that encloses the terrain to be analyzed. The model boundary for this study is a closed polygon defined by drainage basin delineation. The base of the McCoy Mountain foothills define the west boundary, while the north, east, and south boundaries are defined by sub basin delineation (using points of higher elevation). This modeled area includes all drainage areas that contribute to the western and southern project site boundaries and most of the drainage area contributing to the northern project site boundary. Figure 5 shows the boundary delineation of the up-slope HEC-HMS model subbasin boundaries (labeled 1a-5a) and the overland FLO-2D model boundary in relation to the MSEP solar plant site boundary.

The FLO-2D grid element size was determined to coincide with FLO-2D efficiency (stability / computation) guidelines, resulting in grid squares measuring 100 feet on each side. This cell size provides good spatial resolution of the floodplain, without compromising model run time and stability.

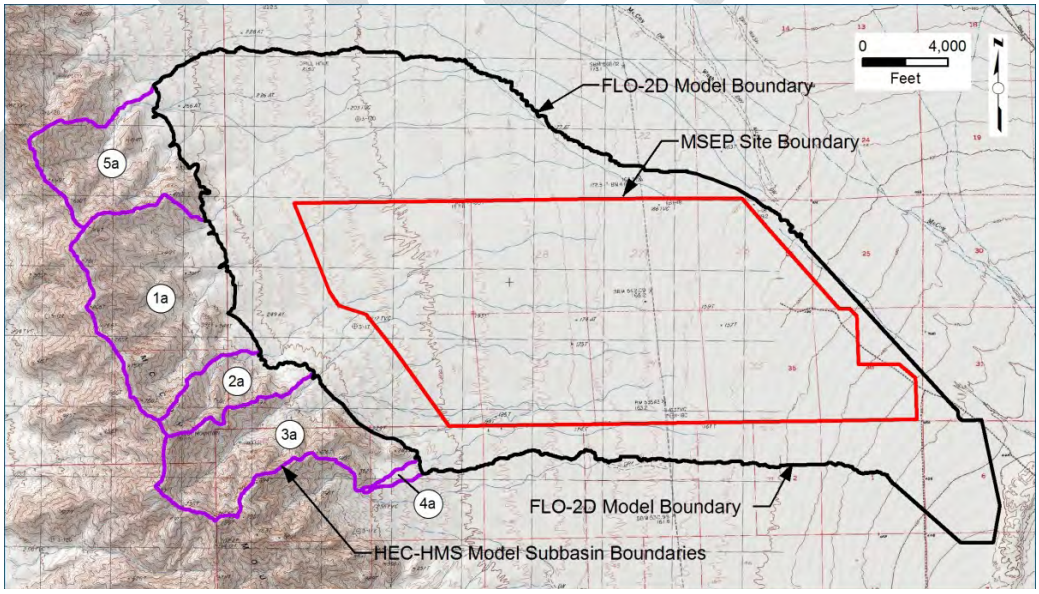


**Figure 5: HMS and FLO-2D Model Boundaries**

[4] TetraTech, *area-e.dwg*, CAD File, April 2011, DVD.

[5] Precipitation frequency estimates in semiarid southeastern California were updated with the April 8, 2011 release of NOAA Atlas 14 Volume 6.
http://www.nws.noaa.gov/oh/hdsc/PF_documents/Atlas14_Vol1_Ver5_Addendum.pdf

## 2.2 Elevation

Grid elevations were interpolated from a data set generated by merging high-resolution (2.0-foot contour) LIDAR data inside the site with lower-resolution (10.0-foot contour) radar[6] data and (30.0-foot contour) USGS topography outside the site. The FLO-2D model tools were used to perform the interpolation, assigning representative elevation to each grid element.

## 2.3 Manning's N

Overland flow velocities and depths vary with topography and surface roughness. A composite overland flow roughness value was assigned to each grid cell to account for vegetation, surface irregularity, and non-uniform[7] and unsteady flow[8]. Manning's n values were chosen based on field observation (refer to Figures 3 and 4) and documented values. Note, FLO-2D utilizes a manning's n roughness value[9] which is specific to overland flow computations and different than the manning's n value[10] used for the HEC-HMS model. Figure 6 shows how the manning's n roughness value (FLO-2D) and manning's n value (HEC-HMS) vary within the model boundaries. Large angular rocks are located upstream where HEC-HMS is used to model the upstream hydrology conditions. Sparse vegetation and sandy soils are predominant across the MSEP solar plant site and values ranging from 0.10-0.15 are used in the FLO-2D model.

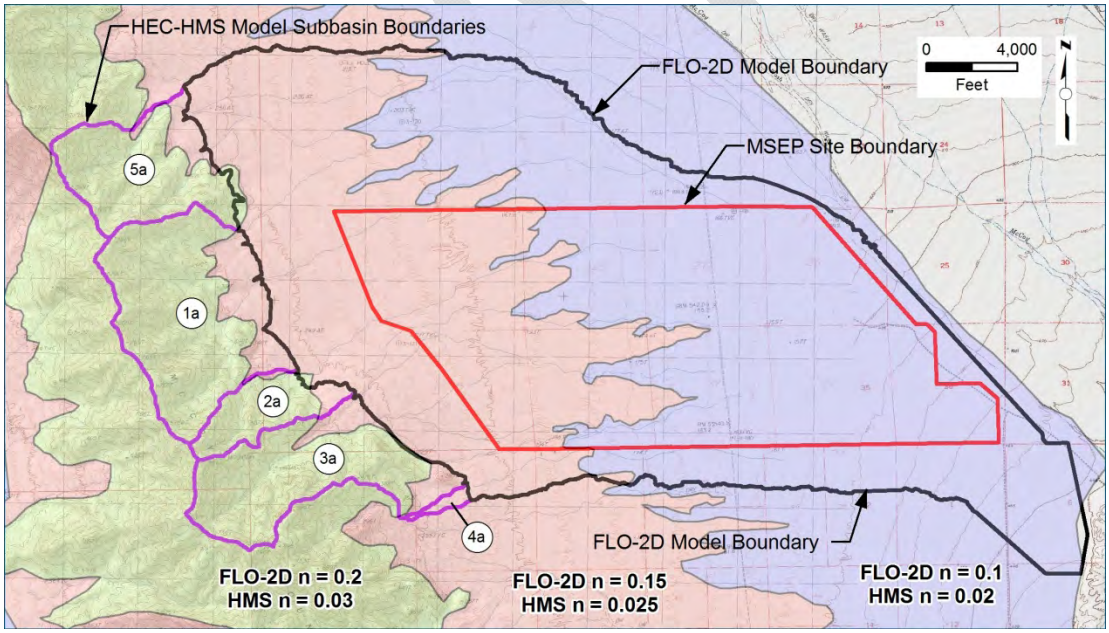


**Figure 6: Manning's N Values**

[6] TetraTech, *Intermap_topo.shp*, Shapefile, March 2011, DVD.
[7] Flow characterized by a varying velocity with respect to distance at a given time.
[8] Flow characterized by a varying velocity with respect to time at a given location.
[9] FLO 2D Reference Manual, Version 2009
[10] Army Corps of Engineers HEC-1 Manual (1990) and Technical Engineering Design Guide, No. 19 (1997)

## 2.4 SCS Curve Number

The SCS Curve Number approach, including water loss through infiltration, was used to account for rainfall-runoff processes inside the modeled area. Curve number (CN) values representing Desert Shrub[11] Soil Groups B and D were used as shown in Figure 7. Initial abstraction values representing the depression storage, evaporation, and interception losses are a function of the CN value and is equal to 0.597 inches where the CN value is 77, and 0.273 inches where the CN value is equal to 88.

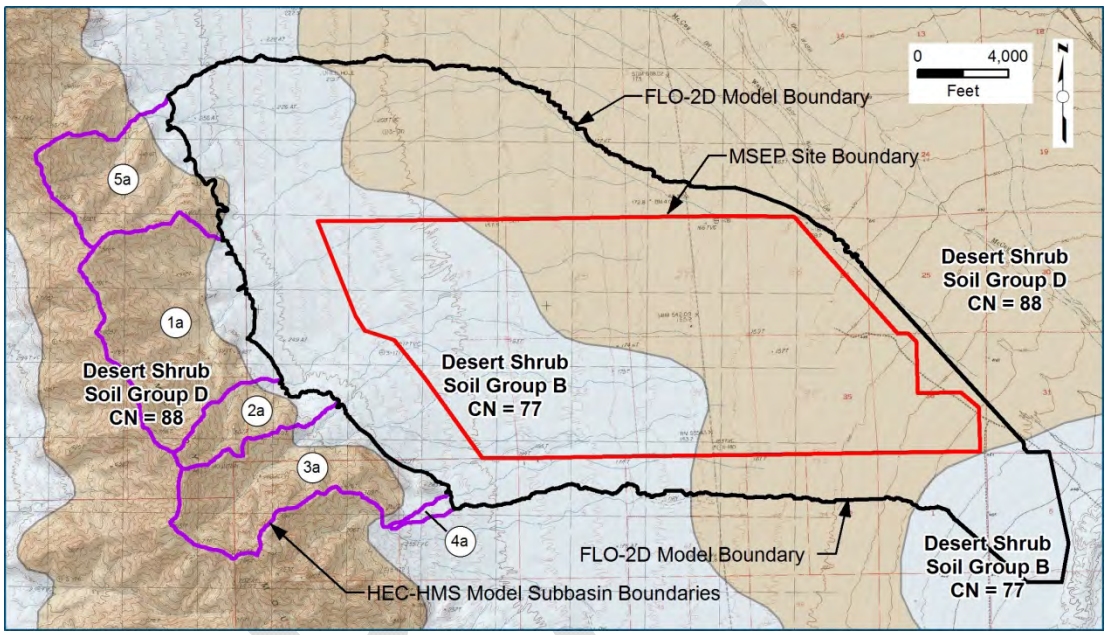


**Figure 7: Curve Number Values**

## 2.5 Precipitation

The 24-hour precipitation event that generates the modeled inflow (HEC-HMS) from upstream drainage basins is assumed to occur concurrently over the project area (FLO-2D model domain). The 24-hour precipitation depth was obtained from NOAA's Precipitation Frequency Data Server. Rainfall depths used for 10-and 100-year return periods were, respectively, 2.22 inches, and 3.93 inches. Precipitation was distributed temporally as a Type II storm, in accordance with the U.S. Soil Conservation Service (now NRCS) Technical Release 55 recommendation for extreme eastern California.

[11] Major plants include saltbrush, greasewood, creosotebush, blackbrush, bursage, palo verde, mesquite, and cactus.

## 2.6 Hydrologic Modeling

The MSEP solar plant site receives surface water flow from higher elevations in the mountains located approximately 3 miles west of the site. Two hydrologic models were used in succession to define the MSEP solar plant site hydrology for the 10-, and 100-year hydrologic events. The upslope hydrology data (modeled in HEC-HMS), LIDAR topography, MSEP solar plant site conditions, on-site rainfall, and physical land attributes (Manning's n and CN), were used as input parameters for the FLO-2D model[12], to analyze flow characteristics (flow rate, velocity, volume, depth, and width) across the MSEP solar plant site.

Five drainage basins were used to define the upslope hydrology (Figure 7 above). Each of these basins was individually modeled in HEC-HMS. Output hydrographs were created for the 10-, and 100-year hydrologic events (see Figures 8 and 9 respectively) and then used to define the FLO-2D inflow contributions at selected inflow nodes located along the western FLO-2D model boundary.

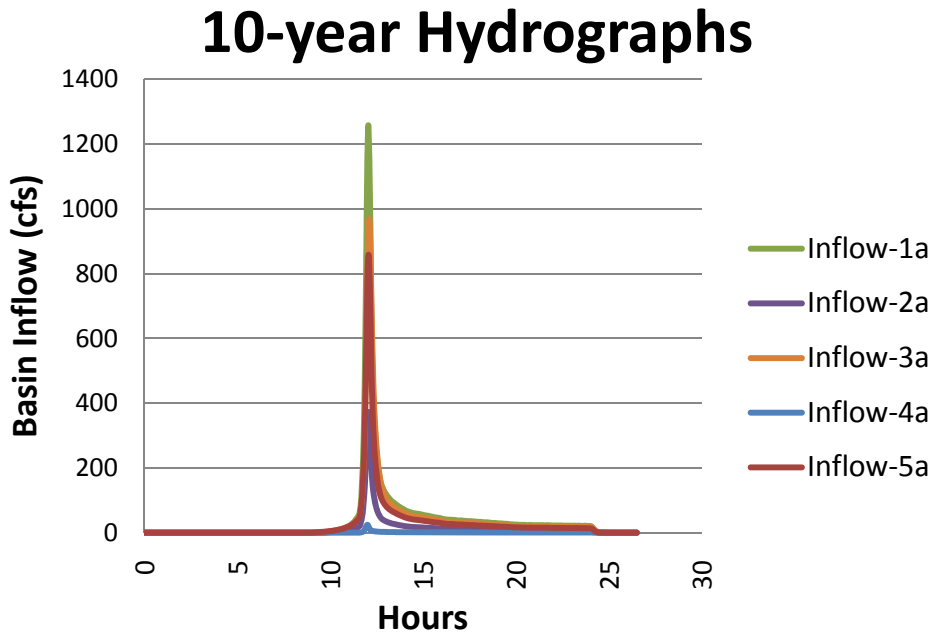


**Figure 8: 10-year Inflow Hydrographs**

[12] FLO-2D Version 2009.06 is a physical process model that routes rainfall-runoff and flood hydrographs over unconfined flow surfaces or in channels. FLO-2D, owned by FLO-2D Software, Inc., is on FEMA's list of approved hydraulic models for riverine and unconfined alluvial fan flood studies, and has been extensively used by the US Army Corps of Engineers (USACE). The FLO-2D model's spatial domain is represented as a system of square grid elements (tiles), called cells, each with an elevation derived from a digital terrain model of the LIDAR topography and hydraulic characteristics. The model provides results of water surface elevation, flow rate and velocity, and other hydraulic parameters for all grid elements in discrete time steps, using a dynamic wave approximation to the momentum equation. FLO-2D simulates infiltration and runoff after rainfall initial abstraction, using the SCS CN method.

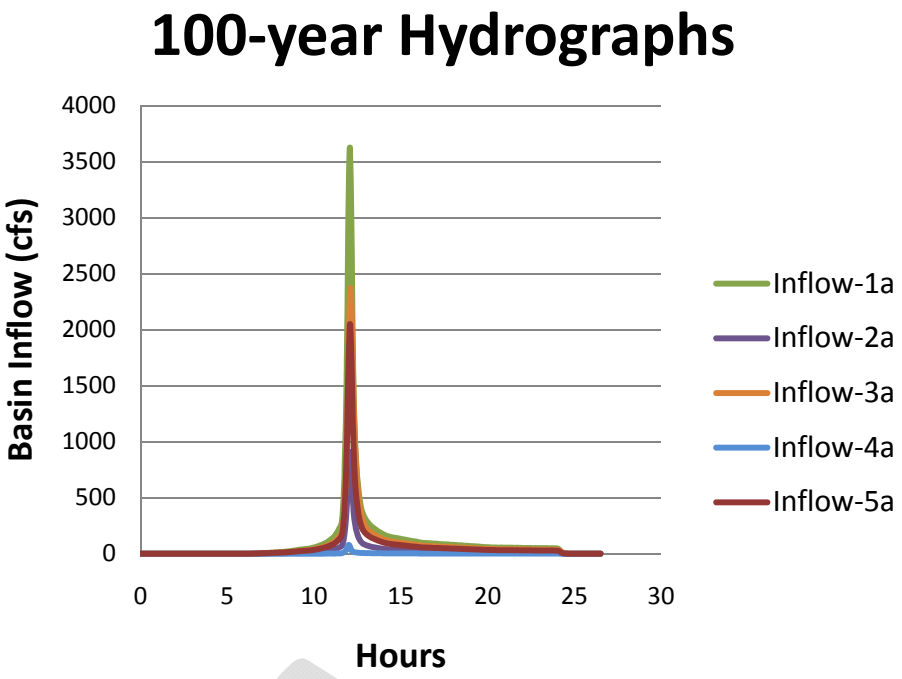


**Figure 9: 100-year Inflow Hydrographs**

Movement of water inside the FLO-2D model area is based on topography and roughness characteristics; therefore, an approximate and extensive portion of the south and east model boundaries were designated as potential model outflow locations. Simulation of drainage outflow through the model boundary was achieved by designating cells along this boundary as "floodplain outflow cells". The two-dimensional modeling process across and through the site simulates outflow locations along the model boundary based on the topographic direction of the overland flow at each model boundary cell.

## 2.7 MSEP Solar Plant Site Condition Flow Patterns (FLO-2D)

### 2.7.1 Off-Site Flow Patterns – Pre-Development

The major watercourse in the project area is McCoy Wash (east of the project site) which drains 210 square miles of the Palo Verde Mesa, McCoy Mountains, Little Maria Mountains and Big Maria Mountains and exits the mesa to the southeast of the site.

The project site lies in the Palo Verde Mesa east of the McCoy Mountains. The general storm water flow pattern is from higher elevations in the McCoy Mountains, located approximately 3 miles west of the project site, into shallow moderately defined channels at the base of the mountains.

Alluvial fans radiate out from the base of the McCoy Mountains and mesa discharging to a broad flat expanse of desert terrain sloping in a southeasterly direction across the MSEP solar plant site. Based on field observations, low flows from the ephemeral washes that traverse the project site from the McCoy Mountains in a west-to-east orientation transition into alluvial fans and abate into the landscape prior to connecting with the McCoy Wash.

The flow generated upstream of the MSEP solar plant site, will not change as a result of the site development.

### 2.7.2 On-site Flow Patterns – Pre-Development

Pre-development onsite flow patterns are generally in an easterly direction and are a continuation of the alluvial fan conditions described above. Most flow is typically directed to moderately defined channels, also known as arroyos. Dry most of the year, the arroyos are shallow channels generally traveling west to east across the MSEP solar plant site. Flow across the MSEP solar plant site generally enter at the west boundary and exit at the southeast boundary.

*Post development flow patterns are to be determined.*

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## 3. RESULTS

- This report provides results of analysis of on-site, pre- and post-development drainage conditions (post-development TBD) at the MSEP solar plant site, utilizing refined topographic site data (LIDAR) and a combination of two physical process hydrologic models, HEC-HMS and FLO-2D. This refined model approach was utilized to generate a more detailed representation of water movement across the MSEP solar plant site, including routing flow from mountainous terrain through shallow moderately-defined channels at the base of the mountains that radiate outward in a complex alluvial fan onto a broad, flat expanse of desert terrain.

- Appendices A and B include maps of the McCoy site (associated with the 10-, and 100-year storm events) of pre- and post-development simulated maximum flow depth (Sheets 1 and 2), maximum velocity (Sheets 3 and 4), and maximum water surface elevation (Sheets 5 and 6).

  Review of the maps described above provides observations of several general flow characteristics. Pre-development flow patterns onsite are generally in an easterly direction with a slight arched pattern across the site. The arch is described by a minor change in flow direction noted to the northeast at the western MSEP solar plant site boundary and a minor change in flow direction to the southeast at the eastern MSEP solar plant site boundary. Post development flow patterns are TBD. The Flow Analysis Cross Sections (refer to Figure ES-1) present the potential changes in flow rate and volume between pre- and post-development conditions.

  - Flow Analysis Cross Section 1- The majority of water flow exiting the site is captured at this cross section. Site alluvial fans converge at the southeastern corner of the site and flows are more concentrated toward the drainage basin outlet.

  - Flow Analysis Cross Section 2- Flows crossing the southern MSEP solar plant site boundary are quantified at this cross section. This cross section corresponds with the boundary of the MSEP solar plant site and the Solar Millennium Blythe Solar Power Project (BSPP) to the South.

  - Flow Analysis Cross Sections 3, 4, 5, and 6 - Incoming water contributions from west of the MSEP solar plant site as it flows through moderately defined channels. Channels are relatively parallel and abate as they move east across the site. Cross section locations were determined based on the flow patterns in these channels. Essentially no changes in flow will occur at these cross sections because no MSEP solar plant site development activity will occur upstream.

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- Tables 1 and 2 below provide a summary of peak flow rate (CFS) and total flow volume (AF) at six Flow Analysis Cross Sections, shown in Figure ES-1, intended to describe flows entering (sections 3-6) and exiting (sections 1 and 2) the MSEP solar plant site. The Flow Analysis Cross Section locations associated with existing flows are utilized as flow measurement locations to compare pre- and post-development site drainage conditions. This comparison, or "delta", will help guide proposed site design to minimize the delta between pre- and post-development site drainage discharges.

**TABLE 1**
**PRE- and POST-DEVELOPMENT FLO2D RESULTS**
**10-Year Storm Event**

| | Pre-Development | | Post-Development | |
|---|---|---|---|---|
| **Flow Analysis Cross Section** | **Peak Flow Rate (CFS)** | **Total Flow Volume (AF)** | **Peak Flow Rate (CFS)** | **Total Flow Volume (AF)** |
| 1 | 165 | 333 | TBD | TBD |
| 2 | 441 | 332 | TBD | TBD |
| 3 | 85 | 18 | TBD | TBD |
| 4 | 329 | 50 | TBD | TBD |
| 5 | 154 | 30 | TBD | TBD |
| 6 | 270 | 36 | TBD | TBD |

**TABLE 2**
**PRE-and POST-DEVELOPMENT FLO2D RESULTS**
**100-Year Storm Event**

| | Pre-Development | | Post-Development | |
|---|---|---|---|---|
| **Flow Analysis Cross Section** | **Peak Flow Rate (CFS)** | **Total Flow Volume (AF)** | **Peak Flow Rate (CFS)** | **Total Flow Volume (AF)** |
| 1 | 979 | 1031 | TBD | TBD |
| 2 | 1308 | 939 | TBD | TBD |
| 3 | 323 | 50 | TBD | TBD |
| 4 | 1051 | 143 | TBD | TBD |
| 5 | 660 | 84 | TBD | TBD |
| 6 | 687 | 91 | TBD | TBD |

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- The FLO-2D model simulates volumetric mass balance of water inflows, losses, and outflows consisting of five primary components listed below and tabulated in Table 4 by column:

  A. Off-Site Surface Water Inflow (estimated with HEC-HMS model).
  B. On-Site Precipitation Inflow (estimated with FLO-2D model).
  C. On-Site Initial Abstraction and Infiltration Losses (estimated with FLO-2D model).
  D. On-Site Watershed Storage (estimated with FLO-2D model).
  E. Surface Water Outflow (calculated with FLO-2D model as item A plus B minus C minus D).

  The volumes represented in the mass balance are intended only to be compared against the corresponding pre- and post- development results, not with the flow volumes represented in the cross section tables above. (The cross sections do not capture the entire outflow of the model boundary.)

**TABLE 3**
**PRE-DEVELOPMENT FLO-2D MODEL RESULTS (MASS BALANCE)**

| Storm Event | A Off-Site SW Inflow (AF) | B On-Site Precip. Inflow (AF) | C On-Site Initial Ab. and Infil. Loss (AF) | D On-Site Watershed Storage (AF) | E Surface Water Outflow (AF) |
|---|---|---|---|---|---|
| 10-Year | 250 | 2044 | 1114 | 404 | 777 |
| 100-Year | 647 | 3919 | 1408 | 419 | 2439 |

**TABLE 4**
**POST-DEVELOPMENT FLO-2D MODEL RESULTS (MASS BALANCE)**

| Storm Event | A Off-Site SW Inflow (AF) | B On-Site Precip. Inflow (AF) | C On-Site Initial Ab. and Infil. Loss (AF) | D On-Site Watershed Storage (AF) | E Surface Water Outflow (AF) |
|---|---|---|---|---|---|
| 10-Year | TBD | TBD | TBD | TBD | TBD |
| 100-Year | TBD | TBD | TBD | TBD | TBD |

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**APPENDIX A:**
**10-year Pre-Development Hydrology Flow Depth, Velocity, and Water Surface Maps**

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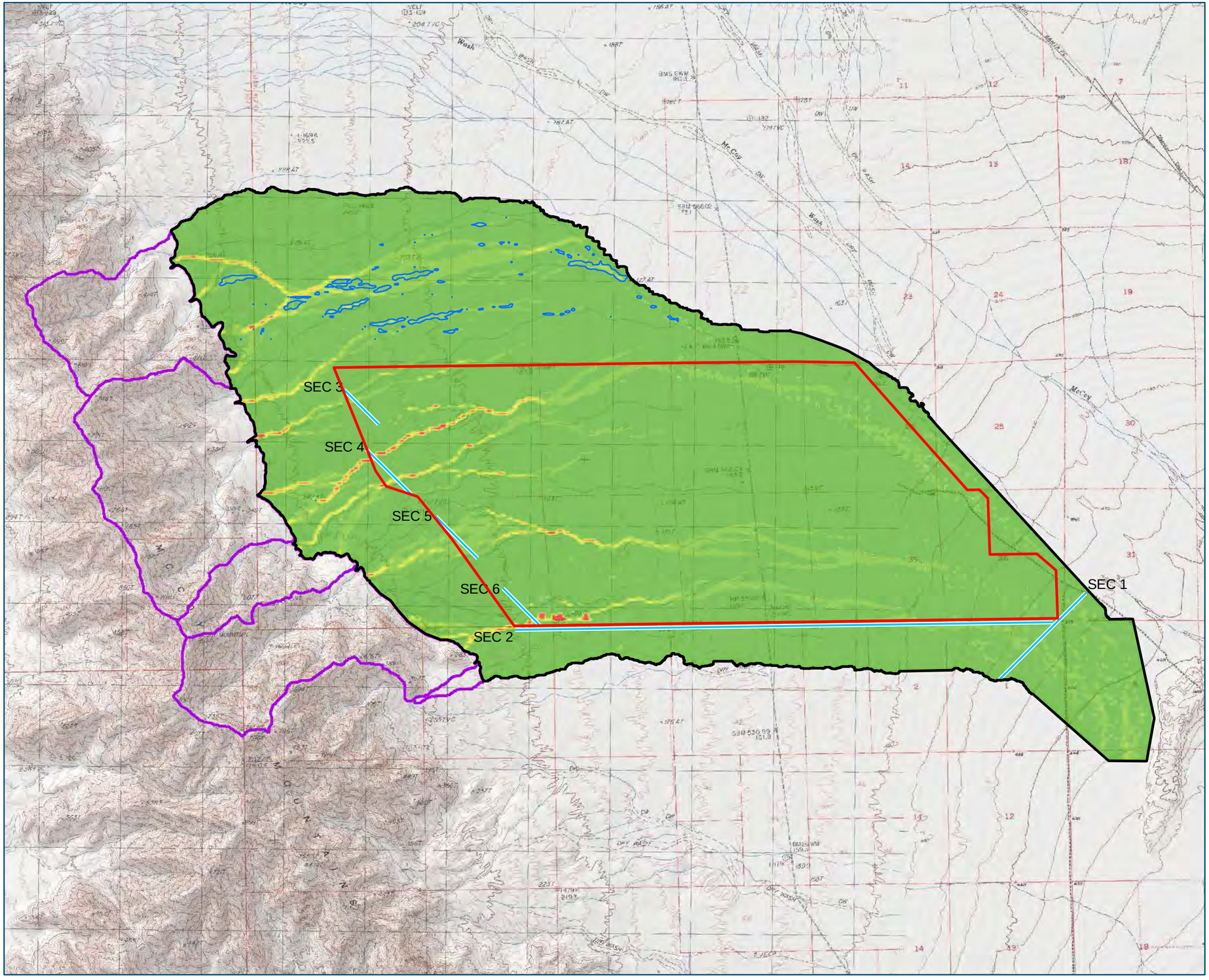
# McCoy Solar Energy Project

Riverside County, CA **DRAFT 08/02/2011**

FIG A1: PRE-DEVELOPMENT CONDITIONS
10 YEAR MAX FLOW DEPTH

*Prepared for* NEXTera ENERGY RESOURCES




## Legend

- McCoy Solar Energy Plant Site Boundary
- Flo2D Model Boundary
- HEC-HMS Model Subbasin Boundaries
- Area of Concentrated Flow*
- Flow Analysis Cross Sections

**Flow Depth (Feet)**

- 0.00 - 0.25
- 0.26 - 0.50
- 0.51 - 0.75
- 0.76 - 1.00
- 1.01 - 1.25
- 1.26 - 1.50
- 1.51 - 1.75
- 1.76 - 2.00
- 2.01 - 2.25
- 2.25 - 3.00

*Area of maximum concentrated flow with water depth exceeding 0.3 feet

0 4,000 8,000 Feet

N

## PROJECT LOCATOR MAP


**File Name:** PreDev10yr_Depth
**MXD File Path:** NextEra\60196225-McCoy\GIS\Layouts\PreDev_10yr
**PDF File Path:** NextEra\60196225-McCoy\GIS\Maps\PreDev_10yr
**Date Modified:** May 26, 2011
**Projection:** NAD 1983 State Plane, California VI, Feet
**Data Sources:** ESRI, USGS, US Census, TetraTech, NextEra

AECOM

# McCoy Solar Energy Project

Riverside County, CA **DRAFT 08/02/2011**

FIG A2: PRE-DEVELOPMENT CONDITIONS
10 YEAR MAX VELOCITY

*Prepared for* NEXTera ENERGY RESOURCES

SEC 3
SEC 4
SEC 5
SEC 6
SEC 2
SEC 1

## Legend

- McCoy Solar Energy Plant Site Boundary
- Flo2D Model Boundary
- HEC-HMS Model Subbasin Boundaries
- Area of Concentrated Flow*
- Flow Analysis Cross Sections

**Velocity (feet/second)**

- 0.00 - 0.25
- 0.26 - 0.50
- 0.51 - 0.75
- 0.76 - 1.00
- 1.01 - 1.25
- 1.26 - 1.50
- 1.51 - 1.75
- 1.76 - 2.00
- 2.01 - 2.25
- 2.25 - 2.30

*Area of maximum concentrated flow with water depth exceeding 0.3 feet

0 4,000 8,000 Feet

N

## PROJECT LOCATOR MAP


**File Name:** PreDev10yr_Depth
**MXD File Path:** NextEra\60196225-McCoy\GIS\Layouts\PreDev_10yr
**PDF File Path:** NextEra\60196225-McCoy\GIS\Maps\PreDev_10yr
**Date Modified:** May 26, 2011
**Projection:** NAD 1983 State Plane, California VI, Feet
**Data Sources:** ESRI, USGS, US Census, TetraTech, NextEra

AECOM

# McCoy Solar Energy Project

Riverside County, CA **DRAFT 08/02/2011**

FIG A3: PRE-DEVELOPMENT CONDITIONS
10 YEAR MAX WATER SURFACE

*Prepared for* NEXTera ENERGY RESOURCES

## Legend

- McCoy Solar Energy Plant Site Boundary
- Flo2D Model Boundary
- HEC-HMS Model Subbasin Boundaries
- Water Elevation (feet)
- Area of Concentrated Flow*
- Flow Analysis Cross Sections

*Area of maximum concentrated flow with water depth exceeding 0.3 feet

0 4,000 8,000 Feet

N

## PROJECT LOCATOR MAP


**File Name:** PreDev10yr_Depth
**MXD File Path:** NextEra\60196225-McCoy\GIS\Layouts\PreDev_10yr
**PDF File Path:** NextEra\60196225-McCoy\GIS\Maps\PreDev_10yr
**Date Modified:** May 26, 2011
**Projection:** NAD 1983 State Plane, California VI, Feet
**Data Sources:** ESRI, USGS, US Census, TetraTech, NextEra

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**APPENDIX B**
**100-year Pre-Development Hydrology Flow Depth, Velocity, and Water Surface Maps**

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# McCoy Solar Energy Project

Riverside County, CA **DRAFT 08/02/2011**

FIG B1: PRE-DEVELOPMENT CONDITIONS
100 YEAR MAX FLOW DEPTH

*Prepared for* NEXTera ENERGY RESOURCES

SEC 3
SEC 4
SEC 5
SEC 6
SEC 2
SEC 1

## Legend

- McCoy Solar Energy Plant Site Boundary
- Flo2D Model Boundary
- HEC-HMS Model Subbasin Boundaries
- Area of Concentrated Flows*
- Flow Analysis Cross Sections

**Flow Depth (Feet)**

- 0.00 - 0.25
- 0.26 - 0.50
- 0.51 - 0.75
- 0.76 - 1.00
- 1.01 - 1.25
- 1.26 - 1.50
- 1.51 - 1.75
- 1.76 - 2.00
- 2.01 - 2.25
- 2.25 - 3.00

*Area of maximum concentrated flow with water depth exceeding 0.3 feet

0 4,000 8,000 Feet

N

## PROJECT LOCATOR MAP


**File Name:** PreDev100yr_Depth
**MXD File Path:** NextEra\60196225-McCoy\GIS\Layouts\PreDev_100yr
**PDF File Path:** NextEra\60196225-McCoy\GIS\Maps\PreDev_100yr
**Date Modified:** May 26, 2011
**Projection:** NAD 1983 State Plane, California VI, Feet
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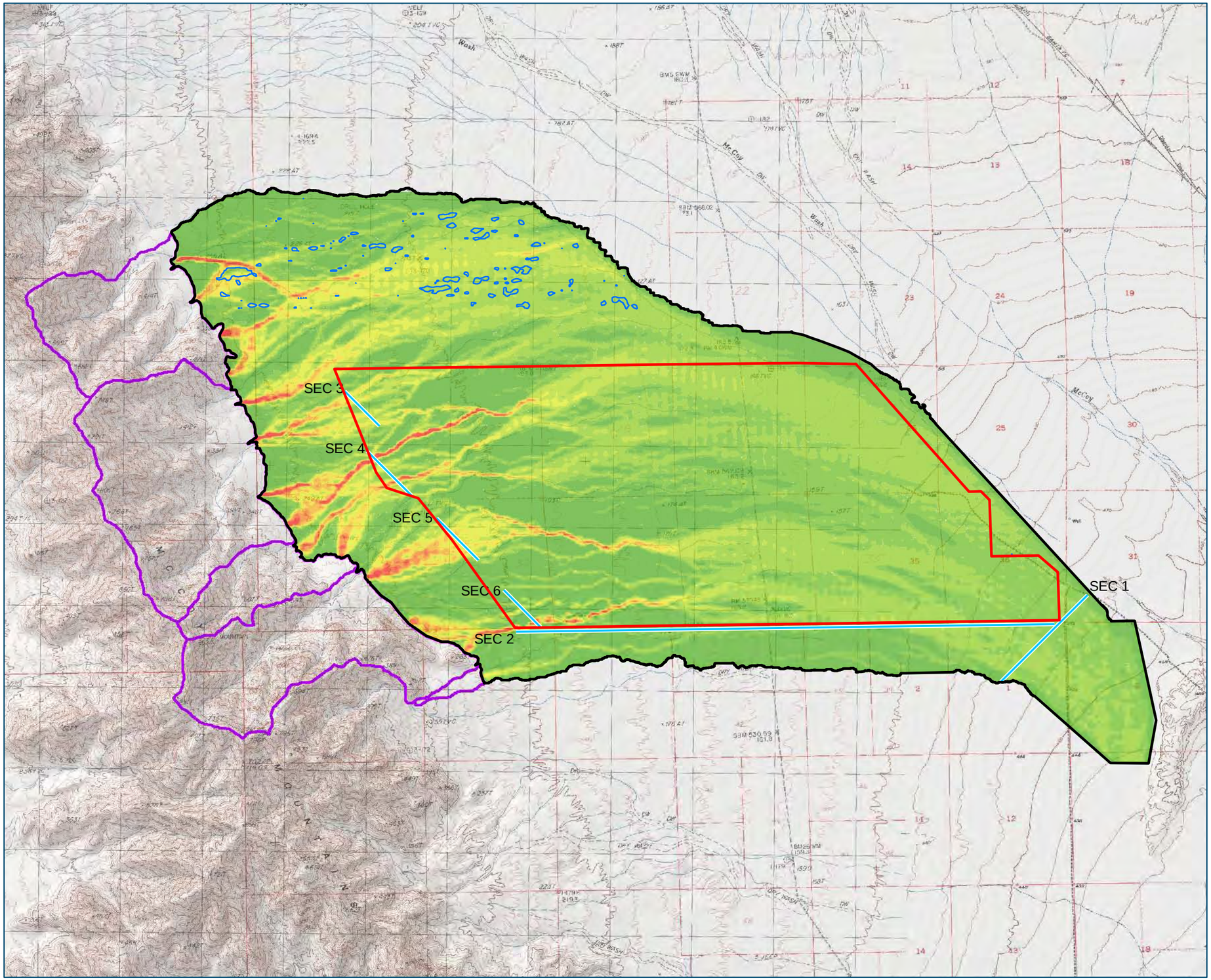
Riverside County, CA **DRAFT 08/02/2011**

FIG B2: PRE-DEVELOPMENT CONDITIONS
100 YEAR MAX VELOCITY

*Prepared for* NEXTera ENERGY RESOURCES




## Legend

- McCoy Solar Energy Plant Site Boundary
- Flo2D Model Boundary
- HEC-HMS Model Subbasin Boundaries
- Area of Concentrated Flows*
- Flow Analysis Cross Sections

**Velocity (feet/second)**

- 0.00 - 0.25
- 0.26 - 0.50
- 0.51 - 0.75
- 0.76 - 1.00
- 1.01 - 1.25
- 1.26 - 1.50
- 1.51 - 1.75
- 1.76 - 2.00
- 2.01 - 2.25
- 2.25 - 2.30

*Area of maximum concentrated flow with water depth exceeding 0.3 feet

0 4,000 8,000 Feet

N

## PROJECT LOCATOR MAP


**File Name:** PreDev100yr_Depth
**MXD File Path:** NextEra\60196225-McCoy\GIS\Layouts\PreDev_100yr
**PDF File Path:** NextEra\60196225-McCoy\GIS\Maps\PreDev_100yr
**Date Modified:** May 26, 2011
**Projection:** NAD 1983 State Plane, California VI, Feet
**Data Sources:** ESRI, USGS, US Census, TetraTech, NextEra

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# McCoy Solar Energy Project

Riverside County, CA **DRAFT 08/02/2011**

FIG B3: PRE-DEVELOPMENT CONDITIONS
100 YEAR MAX WATER SURFACE

*Prepared for* NEXTera ENERGY RESOURCES

## Legend

- McCoy Solar Energy Plant Site Boundary
- Flo2D Model Boundary
- HEC-HMS Model Subbasin Boundaries
- Water Elevation (feet)
- Area of Concentrated Flow*
- Flow Analysis Cross Sections

*Area of maximum concentrated flow with water depth exceeding 0.3 feet

0 4,000 8,000 Feet

N

## PROJECT LOCATOR MAP


**File Name:** PreDev100yr_Depth
**MXD File Path:** NextEra\60196225-McCoy\GIS\Layouts\PreDev_100yr
**PDF File Path:** NextEra\60196225-McCoy\GIS\Maps\PreDev_100yr
**Date Modified:** May 26, 2011
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