APPENDIX 1
ENVIRONMENTAL CHECKLIST FORM INFORMATION

Appendix 1
Environmental Checklist Form Information

PROJECT INFORMATION

1. **Project title:** Adelanto Solar Power Project (ASPP)

2. **Lead agency name and address:**

   Los Angeles Department of Water and Power (LADWP)
   111 North Hope Street
   Los Angeles, California 90012

3. **Contact person and phone number:**
   Charles Holloway, Manager of Environmental Planning and Assessment, (213) 367-0285
   Shilpa Gupta, Project Manager, (213) 367-0610

4. **Project location:** City of Adelanto, San Bernardino County, California - See Section 2.0 of this document.

5. **Project sponsor's name and address:**

   Los Angeles Department of Water and Power (LADWP)
   111 North Hope Street
   Los Angeles, California 90012

6. **General plan designation:** Manufacturing/Industrial (MI)

7. **Zoning:** Manufacturing/Industrial (MI)

8. **Description of project:** The Los Angeles Department of Water and Power (LADWP) proposes to construct and operate the Adelanto Solar Power Project (ASPP) to help the City of Los Angeles meet its renewable energy goals. The ASPP would be a 10-megawatt (MW) solar photovoltaic (PV) power project located on 42.5 acres of LADWP-owned land within the fenced Adelanto Switching Station and DC Converter Station (Adelanto Station), which is located in the City of Adelanto, San Bernardino County, California.

9. **Surrounding land uses and setting:** The project site is located in a sparsely developed section of the City of Adelanto that is zoned for manufacturing and industrial use (MI). The station property is surrounded primarily by paved roads, which receive minimal traffic on the west, south, and east, and light traffic on the north. Adjacent uses include vacant property to the west, southwest, south, and southeast; vacant property and a pipe manufacturing facility to the east; vacant property, a San Bernardino County fire station, the Adelanto Community Correctional Facility, and a California Department of Corrections and Rehabilitation facility to the north; and industrial facilities to the northeast. The nearest residential developments to the project site lie over a mile to the north, southeast, and south, although a few isolated residences are located approximately 0.5 miles to the east of the station.

10. **Other public agencies whose approval is required:** LADWP would coordinate with the following agencies regarding the proposed project:

    - City of Adelanto
    - California Department of Fish and Game
    - Regional Water Quality Control Board
    - U.S. Fish and Wildlife Service

ENVIRONMENTAL FINDINGS

The environmental analysis contained in Section 3 of this document evaluated the potential environmental impacts that would occur with implementation of the proposed project. Accordingly, the environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact".

	Aesthetics
	Agriculture and Forest Resources
	Air Quality
X	Biological Resources
X	Cultural Resources
	Geology/Soils
	Greenhouse Gas Emissions
	Hazards & Hazardous Material
	Hydrology/Water Quality
	Land Use Planning
	Mineral Resources
	Noise
	Population/Housing
	Public Services
	Recreation
	Transportation/Traffic
	Utilities/Service Systems
X	Mandatory Findings of Significance

For those impacts that are potentially significant, measures are incorporated that would avoid or reduce the potentially significant impacts to a level of less than significant. A Mitigation Monitoring and Reporting Program for these measures is provided in Section 4 of this document.

DETERMINATION

On the basis of this initial evaluation:

	I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.
X	I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.
	I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.
	I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.
	I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Charles C. Holloway — 5/20/2010

Charles C. Holloway
Manager of Environmental Planning and Assessment

Date

APPENDIX 2
AIR QUALITY TECHNICAL REPORT

Air Quality Technical Report

for the

Adelanto Solar Power Project

Submitted To:

Power Engineers, Inc.
731 East Ball Road, Suite 100
Anaheim, California 92805

Prepared By:

Scientific Resources Associated
1328 Kaimalino Lane
San Diego, CA 92109

May 7, 2010

Table of Contents

1.0 Introduction

The Los Angeles Department of Water and Power (LADWP) proposes to construct and operate the Adelanto Solar Power Project (ASPP) to help the City of Los Angeles meet its renewable energy goals. The ASPP would be a 10-megawatt (MW) solar photovoltaic (PV) power project located on LADWP-owned land within the fenced Adelanto Switching Station and DC Converter Station (Adelanto Station), which is located in the City of Adelanto, San Bernardino County, California. The parcel identified for development of the ASPP includes approximately 42.5 acres of land in the southwest portion of the Adelanto Station. The actual PV panels and the ancillary facilities necessary for project operations (including roads, transformers, inverters, and transmission lines) may occupy less than the total acres available. It is anticipated that construction for the project would begin in the summer of 2010 and be completed by the end of 2010.

This report presents an assessment of potential air quality impacts associated with the proposed ASPP. The evaluation addresses existing conditions and discusses the potential for air quality impacts from the Project.

2.0 Existing Conditions

2.1 Resource Overview

Criteria Pollutants. Air quality is defined by ambient air concentrations of specific pollutants determined by the United States Environmental Protection Agency (USEPA) to be of concern with respect to the health and welfare of the general public. Seven major pollutants of concern, called "criteria pollutants," are carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), ozone (O_3), suspended particulate matter less than or equal to 10 microns in diameter (PM_{10}), fine particulate matter less than or equal to 2.5 microns in diameter ($PM_{2.5}$), and lead (Pb). The USEPA has established National Ambient Air Quality Standards (NAAQS) for these pollutants. Areas that violate a federal air quality standard are designated as non-attainment areas.

Ambient air quality refers to the atmospheric concentration of a specific compound (amount of pollutants in a specified volume of air) that occurs at a particular geographic location. The ambient air quality levels measured at a particular location are determined by the interactions of emissions, meteorology, and chemistry. Emission considerations include the types, amounts, and locations of pollutants emitted into the atmosphere. Meteorological considerations include wind and precipitation patterns affecting the distribution, dilution, and removal of pollutant emissions. Chemical reactions can transform pollutant emissions into other chemical substances. Ambient air quality data are generally reported as a mass per unit volume (e.g., micrograms per cubic meter of air) or as a volume fraction (e.g., parts per million [ppm] by volume).

Pollutant emissions typically refer to the amount of pollutants or pollutant precursors introduced into the atmosphere by a source or group of sources. Pollutant emissions contribute to the ambient air concentrations of criteria pollutants, either by directly affecting the pollutant concentrations measured in the ambient air or by interacting in the atmosphere to form criteria pollutants. Primary pollutants, such as CO, SO_2, Pb, and some particulates, are emitted directly into the atmosphere from emission sources.

Secondary pollutants, such as O_3, NO_2, and some particulates, are formed through atmospheric chemical reactions that are influenced by meteorology, ultraviolet light, and other atmospheric processes. PM_{10} and $PM_{2.5}$ are generated as primary pollutants by various mechanical processes (for example, abrasion, erosion, mixing, or atomization) or combustion processes. However, PM_{10} and $PM_{2.5}$ can also be formed as secondary pollutants through chemical reactions or by gaseous pollutants condensing into fine aerosols. In general, emissions that are considered "precursors" to secondary pollutants in the atmosphere (such as reactive organic gases [ROG] and oxides of nitrogen [NOx], which are considered precursors for O_3), are the pollutants for which emissions are evaluated to control the level of O_3 in the ambient air.

Existing air quality at a given location can be described by the concentrations of various pollutants in the atmosphere. Pollutants are defined as two general types: (1) "criteria" pollutants and (2) toxic compounds. Criteria pollutants have national and/or state ambient air

quality standards. The USEPA establishes the NAAQS, while the California Air Resources Board (ARB) establishes the state standards, termed the California Ambient Air Quality Standards (CAAQS). The NAAQS represent maximum acceptable concentrations that generally may not be exceeded more than once per year, except the annual standards, which may never be exceeded. The CAAQS represent maximum acceptable pollutant concentrations that are not to be equaled or exceeded.

Toxic Air Contaminants. Toxic air contaminants (TACs) are substances that have the potential to be emitted into the ambient air that have been determined to present some level of acute or chronic health risk (cancer or non-cancer) to the general public. These pollutants may be emitted in trace amounts from various types of sources, including combustion sources.

Greenhouse Gas Emissions. Greenhouse gases (GHGs) are gases that trap heat in the atmosphere. These emissions occur from natural processes as well as human activities. The accumulation of GHGs in the atmosphere regulates the earth's temperature. Scientific evidence indicates a trend of increasing global temperature over the past century, which a number of scientists attribute to an increase in GHG emissions from human activities. The climate change associated with this global warming is predicted to produce negative economic and social consequences across the globe.

Recent observed changes due to global warming include shrinking glaciers, thawing permafrost, a lengthened growing season, and shifts in plant and animal ranges (Intergovernmental Panel on Climate Change 2007). Generally accepted predictions of long-term environmental impacts due to global warming include sea level rise, changing weather patterns with increases in the severity of storms and droughts, changes to local and regional ecosystems including the potential loss of species, and a significant reduction in winter snow pack.

The most common GHGs emitted from natural processes and human activities include carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). Examples of GHGs created and emitted primarily through human activities include fluorinated gases (hydrofluorocarbons and perfluorocarbons) and sulfur hexafluoride. Each GHG is assigned a global warming potential.

The global warming potential is the ability of a gas or aerosol to trap heat in the atmosphere. The global warming potential rating system is standardized to CO_2, which has a value of one. For example, CH_4 has a global warming potential of 21, which means that it has a global warming effect 21 times greater than CO_2 on an equal-mass basis. Total GHG emissions from a source are often reported as a CO_2 equivalent (CO_2e). The CO_2e is calculated by multiplying the emission of each GHG by its global warming potential and adding the results together to produce a single, combined emission rate representing all GHGs. On a national scale, federal agencies are addressing emissions of GHGs by reductions mandated in federal laws and Executive Orders, most recently, Executive Order 13423 Strengthening Federal Environmental, Energy, and Transportation Management (January 24, 2007) was enacted. Several states have promulgated laws as a means to reduce statewide levels of GHG emissions. In particular, the California Global Warming Solutions Act of 2006 directs the State of California to reduce statewide GHG emissions to 1990 levels by the year 2020.

The potential effects of proposed GHG emissions are by nature global, and have cumulative impacts. As individual sources, GHG emissions are not large enough to have an appreciable effect on climate change. Therefore, the impact of proposed GHG emissions to climate change is discussed in the context of cumulative impacts.

2.2 Regulatory Framework

The Federal Clean Air Act (CAA) and its subsequent amendments establish air quality regulations and the NAAQS and delegate the enforcement of these standards to the states. In California, the ARB is responsible for enforcing air pollution regulations. The ARB has in turn delegated the responsibility of regulating stationary emission sources to regional air agencies. In the Adelanto area, which is located in the Western Mojave Desert Area, the Mojave Desert Air Quality Management District (MDAQMD) has this responsibility. The CAA establishes air quality planning processes and requires areas in nonattainment of a NAAQS to develop a State Implementation Plan (SIP) that details how the state will attain the standard within mandated time frames. The requirements and compliance dates for attainment are based on the severity of the nonattainment classification of the area. The national and state ambient air quality standards

are shown in Table 1. In California, the ARB is responsible for enforcing both the federal and state air pollution standards.

Areas that do not meet the NAAQS or CAAQS for a given criteria pollutant are designated as "nonattainment areas" by the USEPA and/or the ARB. Further classifications are given to nonattainment areas to identify the severity and number of violations experienced, and the year in which attainment is anticipated based on implementation of attainment plans. The Western Mojave Desert Area is considered a moderate nonattainment area for the 8-hour O_3 NAAQS; however, a large portion of O_3 exceedances in the Western Mojave Desert Area are attributable to O_3 transport from the South Coast Air Basin. The area is also designated as a moderate nonattainment area for the NAAQS for PM_{10}. The Western Mojave Desert Area is also considered a nonattainment area for the CAAQS for O_3, $PM_{2.5}$, and PM_{10}. The area is considered unclassified or attainment for all other NAAQS and CAAQS for the other criteria pollutants.

Table 1 National and California Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards	NATIONAL STANDARDS [a]	
			Primary [b,c]	Secondary [b,d]
Ozone (O_3)	8-hour	0.070 ppm (137 µg/m^3)	0.075 ppm (147 µg/m^3)	Same as primary
	1-hour	0.09 ppm (180 µg/m^3)	—	—
Carbon monoxide (CO)	8-hour	9.0 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)	—
	1-hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)	—
Nitrogen dioxide (NO_2)	Annual	0.030 ppm (56 µg/m^3)	0.053 ppm (100 µg/m^3)	Same as primary
	1-hour	0.18 ppm (338 µg/m^3)	—	—
Sulfur dioxide (SO_2)	Annual	—	0.030 ppm (80 µg/m^3)	—
	24-hour	0.04 ppm (105 µg/m^3)	0.14 ppm (365 µg/m^3)	—
	3-hour	—	—	0.5 ppm (1,300 µg/m^3)
	1-hour	0.25 ppm (655 µg/m^3)	—	—
PM_{10}	Annual 24-hour	20 µg/m^3 50 µg/m^3	— 150 µg/m^3	— Same as primary
$PM_{2.5}$	Annual 24-hour	12 µg/m^3 —	15.0 µg/m^3 35 µg/m^3	
Lead	Rolling 3-month period	—	0.15 µg/m^3	Same as primary
	Calendar Quarter 30-day average	— 1.5 µg/m^3	1.5 µg/m^3 —	Same as primary —
Hydrogen Sulfide	1-hour	0.03 ppm (42 µg/m^3)	—	—

Notes:

(a) Standards other than the 1-hour ozone, 24-hour PM_{10}, 24-hour $PM_{2.5}$, and those based on annual averages are not to be exceeded more than once a year. The 8-hour ozone national standard has replaced the 1-hour ozone national standard.

(b) Concentrations are expressed first in units in which they were promulgated. Equivalent units given in parenthesis.

(c) Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health. Each state must attain the primary standards no later than 3 years after that state's implementation plan is approved by the USEPA.

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

The following summarizes the air quality rules and regulations that apply to the ASPP.

Federal Regulations. The CAA applies to all air emission sources and to all areas within the United States. Regulations adopted under the CAA that would apply to the ASPP would include the NAAQS, as well as other requirements that have been adopted as part of the MDAQMD's federally approved plans and programs.

As indicated in Federal Register Volume 75, No. 11, Page 2938, the USEPA is considering lowering the 8-hour O_3 standard from 0.075 ppm, which is its current level, to a lower level within the range of 0.060 and 0.070 ppm. The lower level is proposed to provide increased protection for children and other "at risk" populations against O_3 health effects.

State Regulations. The ARB has oversight over air quality in the state of California. Regulation of individual stationary sources has been delegated to local air pollution control agencies. The ARB is responsible for developing programs designed to reduce emissions from non-stationary sources, including motor vehicles and off-road equipment.

The ARB and the California Office of Environmental Health Hazard Assessment (OEHHA) are also responsible for developing regulations governing TACs. TACs include air pollutants that can cause serious illnesses or increased mortality, even in low concentrations. The ARB and OEHHA identify specific air pollutants as TACs, develop health thresholds for exposure to TACs, and develop guidelines for conducting health risk assessments for sources of TAC emissions.

Local Regulations. As discussed in Section 2.1, the APSS is located in the jurisdiction of the MDAQMD. The MDAQMD is responsible for regulating stationary sources of air emissions in the Adelanto area. Stationary sources that have the potential to emit air pollutants into the ambient air are subject to the Rules and Regulations adopted by the MDAQMD.

2.3 Regional Climate

Data from the Western Regional Climate Center (WRCC 2010) indicate that precipitation data were measured at Adelanto from June 1959 through June 1977, but precipitation is no longer monitored at that location. Both precipitation and temperature data are available from the Victorville monitoring station for the period from January 1917 through July 2009. These data are representative of the region. The mean temperature for the Victorville station is 60.50 degrees F with a standard deviation of 1.47 degrees F, and the mean annual precipitation is 5.48 inches with a standard deviation of 2.99 inches. Monthly average temperatures and precipitation for the area are summarized in Table 2.

Table 2 Monthly Average Temperatures and Precipitation – Victorville Meteorological Station

Month	Temperature, ºF				Precipitation, Inches	
	Maximum	Standard Deviation	Minimum	Standard Deviation	Measurement	Standard Deviation
January	58.70	4.12	29.79	3.87	0.96	1.09
February	62.13	3.88	33.08	3.64	1.06	1.33
March	66.95	4.63	36.58	3.10	0.82	0.96
April	74.12	4.71	41.51	2.42	0.36	0.49
May	82.51	4.56	47.73	2.84	0.13	0.24
June	91.61	3.84	54.15	3.02	0.04	0.14
July	98.26	2.84	60.76	3.66	0.13	0.28
August	97.12	2.87	60.00	3.15	0.20	0.36
September	91.11	3.20	53.90	3.52	0.24	0.67
October	80.20	3.98	44.34	3.15	0.32	0.58
November	67.37	4.28	34.48	3.94	0.50	0.64
December	59.38	4.14	29.21	3.39	0.80	0.94
Annual	**77.26**	**1.60**	**43.81**	**1.97**	**5.48**	**2.99**

Source: www.wrcc.dri.edu

Annual temperatures in the Adelanto area range from the high 20s ºF in winter to the high 90s ºF in summer (WRCC 2010). December is the coldest month, with an average minimum temperature of 37.2°. July is the hottest month, with an average maximum temperature of 90.2°F.

The climate in the Adelanto area is categorized as a high desert climate, with dry, hot summers and cool winters. The major influences on the regional climate are the Eastern Pacific high

pressure system, the San Bernardino and San Gabriel mountains to the west, and the Mojave Desert. Figure 1 presents a wind rose from the Victorville meteorological station.

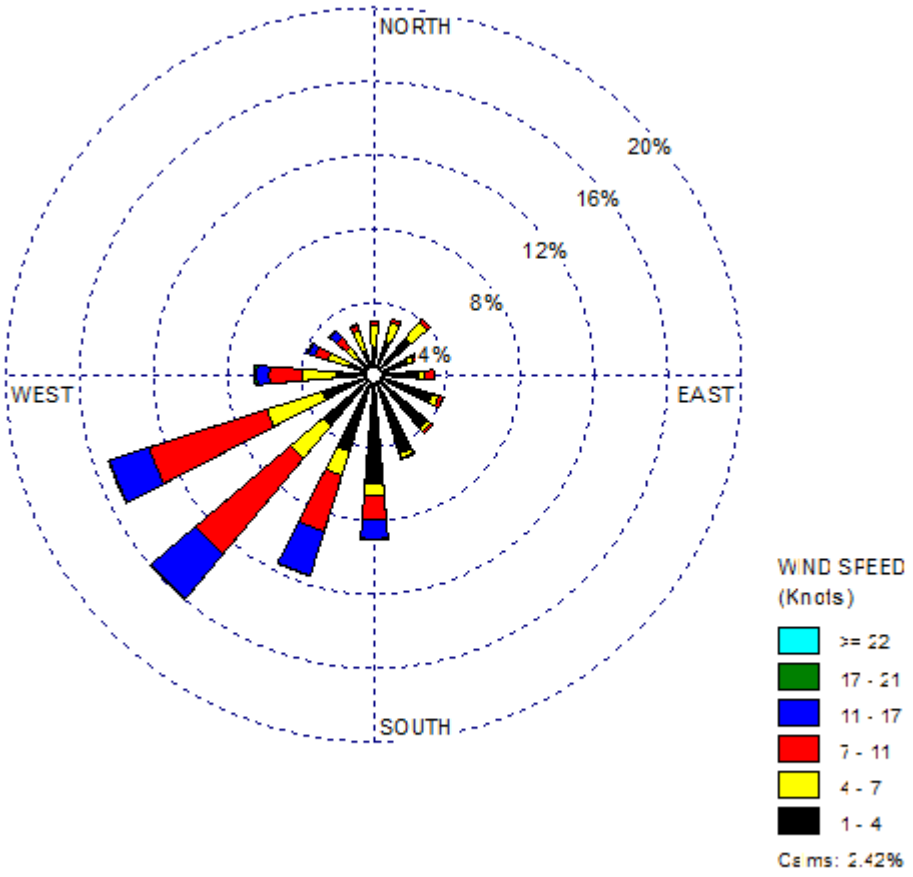

Figure 1. Victorville Wind Rose

2.4 Existing Air Quality

The ARB and the MDAQMD operate a series of ambient air quality monitoring stations throughout the Western Mojave Desert Area. The closest monitoring site to the APSS is located at 14306 Park Avenue in Victorville. The Victorville monitoring station measures O_3, PM_{10}, $PM_{2.5}$, CO, NO_2, and SO_2. Table 3 provides a summary of background air quality representative of the Project region.

Table 3
Representative Air Quality Data for the Adelanto Solar Power Project Area (2004-2008)

Air Quality Indicator	2004	2005	2006	2007	2008
Ozone (O_3)[(1)]					
Peak 1-hour value (ppm)	0.111	0.131	0.136	0.107	0.109
Days above state standard (0.09 ppm)	8	16	9	7	16
Peak 8-hour value (ppm)	0.090	0.107	0.105	0.090	0.098
Days above state standard (0.070 ppm)	39	53	47	45	59
Days above federal standard (0.075 ppm)[(1,3)]	19	33	28	27	30
Particulate matter less than or equal to 10 microns in diameter (PM_{10})					
Peak 24-hour value ($\mu g/m^3$)	56	61	62	358	77
Days above state standard (50 $\mu g/m^3$)	1	1	2	4	2
Days above federal standard (150 $\mu g/m^3$)	0	0	0	1	0
Annual Average value (ppm)	28.0	26.1	30.4	35.9	27.0
Particulate matter less than or equal to 2.5 microns in diameter ($PM_{2.5}$)[(2)]					
Peak 24-hour value ($\mu g/m^3$)	34	27	22	28	19
Days above federal standard (35 $\mu g/m^3$)	0	0	0	0	0
Annual Average value (ppm)	10.7	9.6	10.3	9.7	*
Carbon Monoxide					
Peak 8-hour value ($\mu g/m^3$)	1.70	1.63	1.56	1.61	1.04
Days above federal standard (9 ppm)	0	0	0	0	0
Nitrogen Dioxide (NO_2)					
Peak 1-hour value (ppm)	0.080	0.077	0.079	0.071	0.074
Days above state standard (0.18 ppm)	0	0	0	0	0
Annual Average value (ppm)	0.021	0.019	0.020	0.018	0.016
Sulfur Dioxide (SO_2)					
Peak 24-hour value (ppm)	0.003	0.003	0.005	0.005	0.002
Days above state standard (0.04 ppm)	0	0	0	0	0
Days above federal standard (0.14 ppm)	0	0	0	0	0
Annual Average value (ppm)	0.000	0.000	0.000	0.000	0.000

Notes: [(1)] The federal O_3 standard was revised downward in 2008 to 0.075 ppm.

[(2)] The federal $PM_{2.5}$ standard was revised downward in 2007 to 35 $\mu g/m^3$.

[(3)] The federal eight-hour ozone standard was previously defined as 0.08 ppm (1 significant digit). Measurements were rounded up or down to determine compliance with the standard; therefore a measurement of 0.084 ppm is rounded to 0.08 ppm. The 8-hour ozone ambient air quality standards are met at an ambient air quality monitoring site when the average of the annual fourth-highest daily maximum 8-hour average ozone concentration is less than or equal to the standard.

ppm = parts per million; $\mu g/m^3$ = micrograms per cubic meter; * = not available

Source: http://www.arb.ca.gov/adam/php_files/aqdphp/topfourdisplay.php

3.0 Thresholds of Significance

The CEQA thresholds of significance for air quality are derived from Appendix G of the state CEQA guidelines. These thresholds indicate that a project could have potentially significant impacts if it could:

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

The MDAQMD has adopted its own CEQA guidelines (MDAQMD 2009) and has established significance thresholds based on the state CEQA thresholds. The MDAQMD's significance thresholds are as follows:

Any project is significant if it:

1. Generates total emissions (direct and indirect) in excess of the thresholds given in Table 6 in the guidelines (reproduced as Table 4 below); and/or
2. Generates a violation of any ambient air quality standard when added to the local background; and/or
3. Does not conform with the applicable attainment or maintenance plan(s); and/or
4. Exposes sensitive receptors to substantial pollutant concentrations, including those resulting in a cancer risk greater than 10 in a million and/or a Hazard Index (HI) (non-cancerous) greater than or equal to 1.

Table 4 presents the emission thresholds that are identified in Item 1 above.

Table 4
MDAQMD Significant Emission Thresholds

Criteria Pollutant	Annual Threshold (tons)	Daily Threshold (pounds)
Carbon Monoxide (CO)	100	548
Oxides of Nitrogen (NOx)	25	137
Volatile Organic Compounds (VOCs)	25	137
Oxides of Sulfur (SOx)	25	137
Particulate Matter (PM_{10})	15	82
Particulate Matter ($PM_{2.5}$)	15	82
Hydrogen Sulfide (H_2S)	10	54
Lead (Pb)	0.6	3

The impacts associated with the project were evaluated for significance based on these significance criteria.

4.0 Impacts

The proposed project's air quality impacts are mainly attributable to the construction of the 10 MW solar power plant, including mobilization; clearing, grading, and trenching; construction of the framework foundations and frameworks; installation of the panels and system wiring; installation of the inverters and transformers; and cabling and connection to the switching station. Operational impacts may include inspection and maintenance operations, which would be minor.

4.1 Construction

Emissions of pollutants such as fugitive dust and heavy equipment exhaust that are generated during construction are generally highest near the construction site. Emissions associated with construction would include the following:

- Emissions of fugitive dust from surface disturbance activities
- Emissions of combustion pollutants from heavy construction equipment

- Emissions of combustion pollutants from worker vehicles
- Emissions of combustion pollutants from heavy-duty vehicles transporting construction materials and equipment to the site

As discussed, above, construction activities associated with the ASPP will include the following steps:

1. Mobilization
2. Clearing, grading, and trenching
3. Construction of the framework foundations and frameworks
4. Installation of the panels and system wiring
5. Installation of the inverters and transformers; and
6. Cabling and connection to the switching station

While these tasks are generally sequential in that some must precede others at a given location, a certain amount of overlap would likely occur in different locations within the project site as construction proceeds. It is anticipated that during the peak of construction activity, up to 60 workers may be present on site on a given day. This would generally occur during the last three months of the projected five-month construction schedule, when up to 10 five-person crews and 10 additional construction or supervisory personnel would be required. During the initial two months of construction, it is anticipated that approximately 30 personnel would be on site on a given day. Table 5 provides a monthly estimate of construction worker vehicle commute trips.

Table 5
Construction Worker Vehicle Commute Trips

	Aug 2010	**Sep 2010**	**Oct 2010**	**Nov 2010**	**Dec 2010**
Daily Total (Roundtrip)	30	30	60	60	60
Monthly Total (Roundtrip)	630	630	1260	1260	1260

Other than the delivery of materials and supplies to the site, all construction activities, including supplies laydown, soil excavation and stockpiling, equipment storage, and worker parking, would be confined within the project site or other already disturbed areas of the Adelanto Station. The general truck route during construction would be via Rancho Road (the east-west road north of the station) from Highway 395, which is located approximately 1.5 miles east of the station. No road closures are anticipated during construction. Direct access to the project site would be from existing gates off Pansy Road (the southern boundary of the station) and/or Raccoon Avenue (the western boundary of the station). A very limited number of oversize loads may be required to deliver large equipment to the site at the outset of construction and remove the equipment after construction is completed. However, most deliveries would be made with standard flatbed trucks. Construction materials and supplies would be delivered to the site in a staged manner to minimize the land area required for the laydown. Delivery of materials is expected to be made on flatbed trailers in palletized form and unloaded at the site. During months two through four, approximately 183 total truck trips would be required to deliver materials and supplies to the project site, which would result in an average of 31 truck roundtrips per week. To insure that adequate materials and supplies are available when needed, most of these deliveries may occur early in a given week, resulting in a daily peak of up to 4 flatbed truck roundtrips. When gravel material is being transported to the site, a daily peak of 4 dump truck trips would be made. In addition, during months one through four, a daily peak of 2 concrete truck deliveries per day may be made to the site. Table 6 provides an estimate of the round trips for construction trucks.

Table 6
Construction Truck Round Trips

Truck Description	**Total Trips**	**Trips/ Month**				**Average Trips/Day**	**Peak Trips/Day**
		August	September	October	November		
Dump Trucks	24	0	24	0	0	4	4
Concrete Truck (mths. 1-4)	60	15	15	15	15	1	2
Flatbed Truck (mths. 2-4)	99	0	33	33	33	2	4
Total	**183**	**15**	**72**	**48**	**48**		

Various types of construction equipment would be required during project construction, including graders, bulldozers, backhoes, dump trucks, water trucks, and pickup trucks.

Construction equipment that may be used at various times on the project is listed with estimated hours of operation in Table 7.

Table 7
On-Site Construction Equipment

Equipment Description	Quantity	Days	Hours /Day	Hours of Operation per Month				
				Aug	Sep	Oct	Nov	Dec
3/4 Ton Pickup	6	105	2	252	252	252	252	252
1 Ton Pickup	4	105	2	168	168	168	168	168
CAT D8 Dozer	2	42	4	168	168	0	0	0
CAT 14H Motor Grader	1	42	2	42	42	0	0	0
CAT 563 Roller	1	42	4	84	84	0	0	0
Compact Excavator*	2	63	4	168	168	168	0	0
4000 Gallon Water Truck	1	63	4	84	84	84	0	0
Cable Trencher	1	63	8	168	168	168	0	0
CAT 416 Rubber Tire Backhoe	2	105	4	168	168	168	168	168
Pitman Truck Crane	4	63	4	0	0	336	336	336

As discussed above, the project site is relatively level within the designated solar array field area, and minimal site grading is anticipated. The site currently drains to the northwest. Existing site drainage structures include an earthen berm, which was installed at the time that the switching station was built to redirect natural sheet flow around the switchyard and conduct it along the western side of the station property. The solar panel arrays would be accommodated with minimal modification to the existing site topography and drainage pattern. In addition, most of the area involved in the project, including the solar array field, would remain as permeable surface. A minimum 0.5 percent slope would be required throughout the site to maintaining positive drainage and avoid standing water. It is anticipated that site drainage would continue to be handled primarily above grade and that minimal, if any, sub-grade structures would be required.

Emissions from heavy equipment used in construction of the ASPP were estimated based on emission factors for the SCAB from the ARB's OFFROAD2007 Model (ARB 2007a), as published on the SCAQMD's website. Emission factors for 2010 represent the average fleet emissions throughout the SCAB and were considered representative of construction equipment

that would be used during construction of the project. Emissions from worker travel and truck traffic were calculated using the ARB's EMFAC2007 Model (ARB 2007b) for on-road vehicles. Emissions of fugitive dust were estimated based on SCAQMD and USEPA emission factors. Unmitigated construction emissions may have the potential to result in a temporary significant impact on the air quality. Under the MDAQMD Rules and Regulations, all projects must comply with Rule 403, which prohibits fugitive dust from construction activities that results in emissions that are visible in the atmosphere beyond the property line where construction is occurring. Through the implementation of Rule 403, fugitive dust control measures must be utilized to reduce emissions of particulate matter during construction, and emissions from construction would therefore not conflict with or obstruct implementation of the applicable air quality management plan, and will be mitigated to below a level of significance.

Emissions were estimated based on the construction schedule and equipment requirements for the project provided by the project team. Table 8 presents a summary of the daily construction emissions for the project, for each month during construction, in comparison with the MDAQMD significance thresholds. As shown in Table 8, emissions would be below the significance threshold for all pollutants for each month of construction. Impacts from construction would therefore be less than significant.

Table 8
Estimated Construction Emissions
Adelanto Solar Power Project

Emission Source	ROG	NOx	CO	SOx	PM_{10}	$PM_{2.5}$
Total Construction Emissions, lbs/day						
August						
Heavy Construction Equipment	6.77	24.05	50.56	0.05	2.76	2.46
Worker Vehicles	1.05	26.22	2.93	0.02	0.44	0.16
Construction Truck Trips	0.32	2.91	5.13	0.01	3.23	0.74
Fugitive Dust	-	-	-	-	33.15	6.96
TOTAL	**8.14**	**53.18**	**58.62**	**0.08**	**39.58**	**10.32**
Significance Thresholds	137	137	548	137	82	82
Above Significance Thresholds?	*No*	*No*	*No*	*No*	*No*	*No*
September						
Heavy Construction Equipment	11.69	36.95	99.01	0.11	4.48	3.99
Worker Vehicles	1.05	26.22	2.93	0.02	0.44	0.16
Construction Truck Trips	0.47	3.83	6.22	0.01	3.74	0.89
Fugitive Dust	-	-	-	-	33.15	6.96
TOTAL	**13.20**	**67.01**	**108.16**	**0.14**	**41.82**	**12.00**
Significance Thresholds	137	137	548	137	82	82
Above Significance Thresholds?	*No*	*No*	*No*	*No*	*No*	*No*
October						
Heavy Construction Equipment	6.41	21.61	48.72	0.05	2.58	2.30
Worker Vehicles	2.10	52.45	5.85	0.04	0.88	0.32
Construction Truck Trips	0.47	3.83	6.22	0.01	3.74	0.89
Fugitive Dust	-	-	-	-	33.15	6.96
TOTAL	**8.98**	**77.89**	**60.80**	**0.10**	**40.36**	**10.47**
Significance Thresholds	137	137	548	137	82	82
Above Significance Thresholds?	*No*	*No*	*No*	*No*	*No*	*No*
November						
Heavy Construction Equipment	3.64	13.50	32.89	0.03	1.51	1.34
Worker Vehicles	2.10	52.45	5.85	0.04	0.88	0.32
Construction Truck Trips	0.47	3.83	6.22	0.01	3.74	0.89
Fugitive Dust	-	-	-	-	33.15	6.96
TOTAL	**6.21**	**69.78**	**44.96**	**0.09**	**39.28**	**9.51**
Significance Thresholds	137	137	548	137	82	82
Above Significance Thresholds?	*No*	*No*	*No*	*No*	*No*	*No*
December						
Heavy Construction Equipment	3.64	13.50	32.89	0.03	1.51	1.34
Worker Vehicles	2.10	52.45	5.85	0.04	0.88	0.32
Fugitive Dust	-	-	-	-	33.15	6.96
TOTAL	**5.74**	**65.95**	**38.74**	**0.08**	**35.54**	**8.63**
Significance Thresholds	137	137	548	137	82	82
Above Significance Thresholds?	*No*	*No*	*No*	*No*	*No*	*No*

4.2 Operational Emissions

Operational emissions would be confined to inspection and maintenance activities. No additional personnel would be required at the Adelanto Station on a daily basis to maintain and operate the project. A small number of personnel may be required during brief periods when certain maintenance operations must be performed. Routine maintenance is expected to occur during daylight hours only. Emissions associated with these activities would include on-road vehicle emissions, and fugitive dust generated from inspection and maintenance vehicles traveling on unpaved surfaces at the site. Maintenance equipment is expected to consist of light to medium duty utility pickup trucks and may include a towed trailer with 500 gallon water trailer for PV module washing.

Emissions were estimated to be the same as those for light to medium duty pickup trucks used during construction activities. Table 9 provides an estimate of emissions from maintenance activities. As shown in Table 9, emissions would be below the MDAQMD's significance thresholds, and no significant impacts would result from operation of the ASPP.

Table 9
Estimated Operational Emissions – Maintenance Activities
Adelanto Solar Power Project

Emission Source	ROG	NOx	CO	SOx	PM_{10}	$PM_{2.5}$
Total Operational Emissions, lbs/day						
Construction Truck Trips	0.22	1.50	1.93	0.00	0.95	0.23
TOTAL	**0.22**	**1.50**	**1.93**	**0.00**	**0.95**	**0.23**
Significance Thresholds	137	137	548	137	82	82
Above Significance Thresholds?	*No*	*No*	*No*	*No*	*No*	*No*

4.3 Toxic Air Contaminant Emissions

Construction activities would result in emissions of diesel particulate matter from heavy construction equipment used on site and truck traffic to and from the site, as well as minor amounts of TAC emissions from motor vehicles (such as benzene, 1,3-butadiene, toluene, and xylenes). Health effects attributable to exposure to diesel particulate matter are long-term effects based on chronic (i.e., long-term) exposure to emissions. Health effects are generally evaluated based on a lifetime (70 years) of exposure. Due to the short-term nature of construction at the

site, no adverse health effects would be anticipated from short-term diesel particulate emissions. Motor vehicle emissions would not be concentrated in any one area but would be dispersed along travel routes and would not be anticipated to pose a significant health risk to receptors.

4.4 Odors

Project construction could result in minor amounts of odor compounds associated with diesel heavy equipment exhaust; however, because the construction equipment would be operating at various locations throughout the construction site, and because any operations near existing receptors would be temporary, impacts associated with odors during construction are not considered significant. Solar facilities are not generally considered to be a source of odors.

5.0 Global Climate Change

Global Climate Change (GCC) refers to changes in average climatic conditions on Earth as a whole, including temperature, wind patterns, precipitation and storms. Global temperatures are moderated by naturally occurring atmospheric gases, including water vapor, carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_2O), which are known as greenhouse gases (GHGs). These gases allow solar radiation (sunlight) into the Earth's atmosphere, but prevent radiative heat from escaping, thus warming the Earth's atmosphere. Gases that trap heat in the atmosphere are often called greenhouse gases, analogous to a greenhouse. GHGs are emitted by both natural processes and human activities. The accumulation of GHGs in the atmosphere regulates the Earth's temperature. Emissions from human activities, such as burning fossil fuels for electricity production and vehicle use, have elevated the concentration of these gases in the atmosphere.

The State of California has been at the forefront of developing solutions to address GCC. GCC refers to any significant change in measures of climate, such as average temperature, precipitation, or wind patterns over a period of time. GCC may result from natural factors, natural processes, and/or human activities that change the composition of the atmosphere and alter the surface and features of land.

The United Nations Intergovernmental Panel on Climate Change (IPCC) constructed several emission trajectories of GHGs needed to stabilize global temperatures and climate change impacts. The IPCC concluded that a stabilization of GHGs at 400 to 450 ppm CO_2 equivalent concentration is required to keep global mean warming below 35.6º Fahrenheit (2º Celsius), which is assumed to be necessary to avoid dangerous climate change (Association of Environmental Professionals 2007).

State law defines greenhouse gases as any of the following compounds: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulfur hexafluoride (SF_6) (California Health and Safety Code Section 38505(g).) CO_2, followed by CH_4 and N_2O, are the most common GHGs that result from human activity.

The State of California GHG Inventory performed by the California Air Resources Board (ARB), compiled statewide anthropogenic GHG emissions and sinks. It includes estimates for CO_2, CH_4, N_2O, SF_6, HFCs, and PFCs. The current inventory covers the years 1990 to 2004, and is summarized in Table 10. Data sources used to calculate this GHG inventory include California and federal agencies, international organizations, and industry associations. The calculation methodologies are consistent with guidance from the IPCC. The 1990 emissions level is the sum total of sources and sinks from all sectors and categories in the inventory. The inventory is divided into seven broad sectors and categories in the inventory. These sectors include: Agriculture; Commercial; Electricity Generation; Forestry; Industrial; Residential; and Transportation.

Table 10
State of California GHG Emissions by Sector

Sector	Total 1990 Emissions ($MMTCO_2e$)	Percent of Total 1990 Emissions	Total 2004 Emissions ($MMTCO_2e$)	Percent of Total 2004 Emissions
Agriculture	23.4	5%	27.9	6%
Commercial	14.4	3%	12.8	3%
Electricity Generation	110.6	26%	119.8	25%
Forestry (excluding sinks)	0.2	<1%	0.2	<1%
Industrial	103.0	24%	96.2	20%
Residential	29.7	7%	29.1	6%
Transportation	150.7	35%	182.4	38%
Forestry Sinks	(6.7)		(4.7)	

When accounting for GHGs, all types of GHG emissions are expressed in terms of CO_2 equivalents (CO_2e) and are typically quantified in metric tons (MT) or millions of metric tons (MMT).

GHGs have varying global warming potential (GWP). The GWP is the potential of a gas or aerosol to trap heat in the atmosphere; it is the "cumulative radiative forcing effect of a gas over a specified time horizon resulting from the emission of a unit mass of gas relative to a reference gas" (USEPA 2006). The reference gas for GWP is CO_2; therefore, CO_2 has a GWP of 1. The other main greenhouse gases that have been attributed to human activity include CH_4, which has a GWP of 21, and N_2O, which has a GWP of 310. Table 11 presents the GWP and atmospheric lifetimes of common GHGs.

Table 11
Global Warming Potentials and Atmospheric Lifetimes of GHGs

GHG	Formula	100-Year Global Warming Potential	Atmospheric Lifetime (Years)
Carbon Dioxide	CO_2	1	Variable
Methane	CH_4	21	12 ± 3
Nitrous Oxide	N_2O	310	120
Sulfur Hexafluoride	SF_6	23,900	3,200

Human-caused sources of CO_2 include combustion of fossil fuels (coal, oil, natural gas, gasoline and wood). Data from ice cores indicate that CO_2 concentrations remained steady prior to the current period for approximately 10,000 years. Concentrations of CO_2 have increased in the atmosphere since the industrial revolution.

CH_4 is the main component of natural gas and also arises naturally from anaerobic decay of organic matter. Human-caused sources of natural gas include landfills, fermentation of manure and cattle farming. Human-caused sources of N_2O include combustion of fossil fuels and industrial processes such as nylon production and production of nitric acid.

Other GHGs are present in trace amounts in the atmosphere and are generated from various industrial or other uses.

5.1 Regulatory Framework

All levels of government have some responsibility for the protection of air quality, and each level (Federal, State, and regional/local) has specific responsibilities relating to air quality regulation. GHG emissions and the regulation of GHGs is a relatively new component of air quality.

5.1.1 National and International Efforts

GCC is being addressed at both the international and federal levels. In 1988, the United Nations and the World Meteorological Organization established the IPCC to assess the scientific, technical, and socioeconomic information relevant to understanding the scientific basis for human-induced climate change, its potential impacts, and options for adaptation and mitigation. The most recent reports of the IPCC have emphasized the scientific consensus that real and measurable changes to the climate are occurring, that they are caused by human activity, and that significant adverse impacts on the environment, the economy, and human health and welfare are unavoidable.

In October 1993, President Clinton announced his Climate Change Action Plan (CCAP), which had a goal of returning GHG emissions to 1990 levels by the year 2000. This was to be

accomplished through 50 initiatives that relied on innovative voluntary partnerships between the private sector and government aimed at producing cost-effective reductions in GHG emissions. On March 21, 1994, the United States joined a number of countries around the world in signing the United Nations Framework Convention on Climate Change (UNFCCC). Under the Convention, governments agreed to gather and share information on GHG emissions, national policies, and best practices; launch national strategies for addressing GHG emissions and adapting to expected impacts, including the provision of financial and technological support to developing countries; and cooperate in preparing for adaptation to the impacts of GCC. Recently, the United States Supreme Court declared in the court case of Massachusetts et al. vs. the Environmental Protection Agency et al., 549 C.S. 497 (2007) that the EPA does have the ability to regulate GHG emissions. In addition to the national and international efforts described above, many local jurisdictions have adopted climate change policies and programs.

Endangerment Finding. On April 17, 2009, EPA issued its proposed endangerment finding for GHG emissions. On December 7, 2009, the EPA Administrator signed two distinct findings regarding greenhouse gases under section 202(a) of the Clean Air Act:

> **Endangerment Finding:** The Administrator finds that the current and projected concentrations of the six key well-mixed greenhouse gases--carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6)--in the atmosphere threaten the public health and welfare of current and future generations.
>
> **Cause or Contribute Finding:** The Administrator finds that the combined emissions of these well-mixed greenhouse gases from new motor vehicles and new motor vehicle engines contribute to the greenhouse gas pollution which threatens public health and welfare.

The endangerment findings do not themselves impose any requirements on industry or other entities. However, this action is a prerequisite to finalizing the EPA's proposed greenhouse gas emission standards for light-duty vehicles, which were jointly proposed by EPA and the

Department of Transportation's National Highway Safety Administration on September 15, 2009.

Proposed Mandatory GHG Reporting Rule. On March 10, 2009, in response to the FY2008 Consolidated Appropriations Act (H.R. 2764; Public Law 110–161), EPA proposed a rule that requires mandatory reporting of greenhouse gas (GHG) emissions from large sources in the United States. The proposed rule would collect accurate and comprehensive emissions data to inform future policy decisions.

EPA is proposing that suppliers of fossil fuels or industrial greenhouse gases, manufacturers of vehicles and engines, and facilities that emit 25,000 metric tons or more per year of GHG emissions submit annual reports to EPA. The gases covered by the proposed rule are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFC), perfluorocarbons (PFC), sulfur hexafluoride (SF_6), and other fluorinated gases including nitrogen trifluoride (NF_3) and hydrofluorinated ethers (HFE).

Corporate Average Fuel Economy Standards. The federal Corporate Average Fuel Economy (CAFE) standard determines the fuel efficiency of certain vehicle classes in the United States. In 2007, as part of the Energy and Security Act of 2007, CAFE standards were increased for new light-duty vehicles to 35 miles per gallon by 2020. In May 2009, President Obama announced plans to increase CAFE standards to require light-duty vehicles to meet an average fuel economy of 35.5 miles per gallon by 2016.

5.1.2 State Regulations and Standards

The following subsections describe regulations and standards that have been adopted by the State of California to address GCC issues.

Assembly Bill 32, the California Global Warming Solutions Act of 2006. In September 2006, Governor Schwartzenegger signed California AB 32, the global warming bill, into law. AB 32 directs the ARB to do the following:

- Make publicly available a list of discrete early action GHG emission reduction measures that can be implemented prior to the adoption of the statewide GHG limit and the measures required to achieve compliance with the statewide limit.
- Make publicly available a GHG inventory for the year 1990 and determine target levels for 2020.
- On or before January 1, 2010, adopt regulations to implement the early action GHG emission reduction measures.
- On or before January 1, 2011, adopt quantifiable, verifiable, and enforceable emission reduction measures by regulation that will achieve the statewide GHG emissions limit by 2020, to become operative on January 1, 2012, at the latest. The emission reduction measures may include direct emission reduction measures, alternative compliance mechanisms, and potential monetary and non-monetary incentives that reduce GHG emissions from any sources or categories of sources that ARB finds necessary to achieve the statewide GHG emissions limit.
- Monitor compliance with and enforce any emission reduction measure adopted pursuant to AB 32.

AB 32 required that by January 1, 2008, ARB determine what the statewide GHG emissions level was in 1990, and approve a statewide GHG emissions limit that is equivalent to that level, to be achieved by 2020. ARB adopted its Scoping Plan in December 2008, which provided estimates of the 1990 GHG emissions level and identified sectors for the reduction of GHG emissions. The ARB has estimated that the 1990 GHG emissions level was 427 MMT net CO_2e (ARB 2007b). The ARB estimates that a reduction of 173 MMT net CO_2e emissions below business-as-usual would be required by 2020 to meet the 1990 levels (ARB 2007b). This amounts to a 15-percent reduction from today's levels, and a 30-percent reduction from projected business-as-usual levels in 2020 (ARB 2008a).

Senate Bill 97. Senate Bill 97, enacted in 2007, amends the CEQA statute to clearly establish that GHG emissions and the effects of GHG emissions are appropriate subjects for CEQA analysis. It directs OPR to develop draft CEQA guidelines "for the mitigation of greenhouse gas

emissions or the effects of greenhouse gas emissions" by July 1, 2009 and directs the Resources Agency to certify and adopt the CEQA guidelines by January 1, 2010.

The Governor's Office of Planning and Research (OPR) published a technical advisory on CEQA and Climate Change on June 19, 2008. The guidance did not include a suggested threshold, but stated that the OPR has asked CARB to, "recommend a method for setting thresholds which will encourage consistency and uniformity in the CEQA analysis of greenhouse gas emissions throughout the state." The OPR does recommend that CEQA analyses include the following components:

- Identify greenhouse gas emissions
- Determine Significance
- Mitigate Impacts

In April, the OPR published its proposed revisions to CEQA to address GHG emissions. The amendments to CEQA indicate the following:

- Climate action plans and other greenhouse gas reduction plans can be used to determine whether a project has significant impacts, based upon its compliance with the plan.
- Local governments are encouraged to quantify the greenhouse gas emissions of proposed projects, noting that they have the freedom to select the quantitative and qualitative models and methodologies that best meet their needs and circumstances. The section also recommends consideration of several qualitative factors that may be used in the determination of significance, such as the extent to which the given project complies with state, regional, or local GHG reduction plans and policies. OPR does not set or dictate specific thresholds of significance. Consistent with existing CEQA Guidelines, OPR encourages local governments to develop and publish their own thresholds of significance for GHG impacts assessment.
- When creating their own thresholds of significance, local governments may consider the thresholds of significance adopted or recommended by other public agencies, or recommended by experts.
- New amendments include guidelines for determining methods to mitigate the effects of greenhouse gas emissions in Appendix F of the CEQA Guidelines.
- OPR is clear to state that "to qualify as mitigation, specific measures from an existing plan must be identified and incorporated into the project; general compliance with a plan, by itself, is not mitigation."

- OPR's emphasizes the advantages of analyzing GHG impacts on an institutional, programmatic level. OPR therefore approves tiering of environmental analyses and highlights some benefits of such an approach.
- Environmental impact reports (EIRs) must specifically consider a project's energy use and energy efficiency potential.

On July 3, 2009, the California Natural Resources Agency published proposed amendment of regulations based on OPR's proposed revisions to CEQA to address GHG emissions. On that date, the Natural Resources Agency commenced the Administrative Procedure Act rulemaking process for certifying and adopting these amendments pursuant to Public Resources Code section 21083.05. Having reviewed and considered all comments received, the Natural Resources Agency revised the CEQA regulation. The new regulations became effective on March 18, 2010.

Executive Order S-3-05. Executive Order S-3-05, signed by Governor Schwartzenegger on June 1, 2005, calls for a reduction in GHG emissions to 1990 levels by 2020 and for an 80 percent reduction in GHG emissions by 2050. Executive Order S-3-05 also calls for the California EPA (CalEPA) to prepare biennial science reports on the potential impact of continued GCC on certain sectors of the California economy. The first of these reports, "Our Changing Climate: Assessing Risks to California", and its supporting document "Scenarios of Climate Change in California: An Overview" were published by the California Climate Change Center in 2006.

California Code of Regulations Title 24. Although not originally intended to reduce greenhouse gas emissions, California Code of Regulations Title 24 Part 6: California's Energy Efficiency Standards for Residential and Nonresidential Buildings were first established in 1978 in response to a legislative mandate to reduce California's energy consumption. The standards are updated periodically to allow consideration and possible incorporation of new energy efficiency technologies and methods. The GHG emission inventory was based on Title 24 standards as of October 2005; however, Title 24 has been updated as of 2008 and standards are set to be phased in in summer 2009. Energy efficient buildings require less electricity, natural gas, and other fuels. Electricity production from fossil fuels and on-site fuel combustion (typically for water heating) results in greenhouse gas emissions. Therefore, increased energy

efficiency results in decreased greenhouse gas emissions.

State Standards Addressing Vehicular Emissions. California Assembly Bill 1493 (Pavley) enacted on July 22, 2002, required the ARB to develop and adopt regulations that reduce greenhouse gases emitted by passenger vehicles and light duty trucks. Regulations adopted by ARB would apply to 2009 and later model year vehicles. ARB estimated that the regulation would reduce climate change emissions from light duty passenger vehicle fleet by an estimated 18% in 2020 and by 27% in 2030 (AEP 2007). The ARB has adopted amendments to the "Pavley" regulations that reduce greenhouse gas (GHG) emissions in new passenger vehicles from 2009 through 2016. The amendments, approved by the Board on September 24, 2009, are part of California's commitment toward a nation-wide program to reduce new passenger vehicle GHGs from 2012 through 2016. ARB's September amendments will cement California's enforcement of the Pavley rule starting in 2009 while providing vehicle manufacturers with new compliance flexibility. The amendments will also prepare California to harmonize its rules with the federal rules for passenger vehicles.

Executive Order S-01-07 was enacted by the Governor on January 18, 2007. Essentially, the order mandates the following: 1) that a statewide goal be established to reduce the carbon intensity of California's transportation fuels by at least 10 percent by 2020; and 2) that a Low Carbon Fuel Standard ("LCFS") for transportation fuels be established for California. It is assumed that the effects of the LCFS would be a 10% reduction in GHG emissions from fuel use by 2020. On April 23, 2009, ARB adopted regulations to implement the LCFS.

Executive Order S-21-09. Executive Order S-21-09 was enacted by the Governor on September 15, 2009. Executive Order S-21-09 requires that the ARB, under its AB 32 authority, adopt a regulation by July 31, 2010 that sets a 33 percent renewable energy target as established in Executive Order S-14-08. Under Executive Order S-21-09, the ARB will work with the Public Utilities Commission and California Energy Commission to encourage the creation and use of renewable energy sources, and will regulate all California utilities. The ARB will also consult with the Independent System Operator and other load balancing authorities on the impacts on reliability, renewable integration requirements, and interactions with wholesale power markets in carrying out the provisions of the Executive Order. The order requires the

ARB to establish highest priority for those resources that provide the greatest environmental benefits with the least environmental costs and impacts on public health.

5.2 Potential Climate Change Impacts to Project

The Climate Scenarios Report (CCCC 2006), uses a range of emissions scenarios developed by the IPCC to project a series of potential warming ranges (i.e., temperature increases) that may occur in California during the 21st century. Three warming ranges were identified: Lower warming range (3.0 to 5.5 degrees Fahrenheit (ºF)); medium warming range (5.5 to 8.0 ºF); and higher warming range (8.0 to 10.5 ºF). The Climate Scenarios report then presents an analysis of the future projected climate changes in California under each warming range scenario.

According to the report, substantial temperature increases would result in a variety of impacts to the people, economy, and environment of California. These impacts would result from a projected increase in extreme conditions, with the severity of the impacts depending upon actual future emissions of GHGs and associated warming. These impacts are described below.

Public Health. Higher temperatures are expected to increase the frequency, duration, and intensity of conditions conducive to air pollution formation. For example, days with weather conducive to O_3 formation are projected to increase by 25 to 35 percent under the lower warming range and 75 to 85 percent under the medium warming range. In addition, if global background O_3 levels increase as is predicted in some scenarios, it may become impossible to meet local air quality standards. An increase in wildfires could also occur, and the corresponding increase in the release of pollutants including $PM_{2.5}$ could further compromise air quality. The Climate Scenarios report indicates that large wildfires could become up to 55 percent more frequent of GHG emissions are not significantly reduced.

Potential health effects from global climate change may arise from temperature increases, climate-sensitive diseases, extreme events, and air quality. There may be direct temperature effects through increases in average temperature leading to more extreme heat waves and less extreme cold spells. Those living in warmer climates are likely to experience more stress and

heat-related problems (e.g., heat rash and heat stroke). In addition, climate sensitive diseases (such as malaria, dengue fever, yellow fever, and encephalitis) may increase, such as those spread by mosquitoes and other disease-carrying insects.

Climate change could affect the project area in that it is located in the desert area of California, where warmer climates may lead to more of the problems identified above related to heat, should increases in average temperature in the project area occur.

Water Resources. A vast network of reservoirs and aqueducts capture and transport water throughout the State from northern California rivers and the Colorado River. The current distribution system relies on Sierra Nevada mountain snowpack to supply water during the dry spring and summer months. Rising temperatures, potentially compounded by decreases in precipitation, could severely reduce spring snowpack, increasing the risk of summer water shortages. In addition, if temperatures continue to rise more precipitation would fall as rain instead of snow, further reducing the Sierra Nevada spring snowpack by as much as 70 to 90 percent. The State's water resources are also at risk from rising sea levels. An influx of seawater would degrade California's estuaries, wetlands, and groundwater aquifers.

This global climate change impact is not likely to have a direct effect on the operation of the APSS.

Agriculture. Increased GHG and associated increases in temperature are expected to cause widespread changes to the agricultural industry, reducing the quantity and quality of agricultural products statewide. Significant reductions in available water supply to support agriculture would also impact production. Crop growth and development will change as will the intensity and frequency of pests and diseases. This effect of global climate change would not be anticipated to affect the project site directly because there are no agricultural uses present.

Ecosystems/Habitats. Continued global warming will likely shift the ranges of existing invasive plants and weeds, thus alternating competition patterns with native plants. Range expansion is expected in many species while range contractions are less likely in rapidly

evolving species with significant populations already established. Continued global warming is also likely to increase the populations of and types of pests. Continued global warming would also affect natural ecosystems and biological habitats throughout the State. This effect of global climate change could affect current ecosystems/habitats at the project site.

Wildland Fires. Global warming is expected to increase the risk of wildfire and alter the distribution and character of natural vegetation. If temperatures rise into the medium warming range, the risk of large wildfires in California could increase by as much as 55 percent, which is almost twice the increase expected if temperatures stay in the lower warming range. However, since wildfire risk is determined by a combination of factors including precipitation, winds, temperature, and landscape and vegetation conditions, future risks will not be uniform throughout the State. Should global climate change in the southern California region lead to increased risk of wildfires, this impact could directly affect the project site in that the potential for wildfire at the project location would increase.

Rising Sea Levels. Rising sea levels, more intense coastal storms, and warmer water temperatures will increasing threaten the State's coastal regions. Under the high warming scenario, sea level is anticipated to rise 22 to 35 inches by 2100. A sea level risk of this magnitude would inundate coastal areas with salt water, accelerate coastal erosion, threaten levees and inland water systems, and disrupt wetlands and natural habitats. Because the project site is located in the high desert area at approximately 2,900 feet above sea level, it is not anticipated that rising sea levels would have a direct affect on the project.

5.3 Impacts

The effects of project-specific GHG emissions are cumulative, and therefore GCC impacts are addressed as a cumulative, rather than a direct, impact. The guidance for determining significance of impacts has been developed from the requirements of AB 32. The guideline addresses the potential cumulative impacts that a project's GHG emissions could have on GCC. Based on Appendix G of the CEQA Guidelines, the following criteria are used to evaluate whether a project would result in a significant impact for GCC impacts:

Would the project:

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

As discussed in Section 15064.4 of the CEQA Regulations, the determination of the significance of greenhouse gas emissions calls for a careful judgment by the lead agency consistent with the provisions in section 15064. A lead agency should make a good-faith effort, based to the extent possible on scientific and factual data, to describe, calculate or estimate the amount of greenhouse gas emissions resulting from a project. A lead agency shall have discretion to determine, in the context of a particular project, whether to:

(1) Use a model or methodology to quantify greenhouse gas emissions resulting from a project, and which model or methodology to use. The lead agency has discretion to select the model or methodology it considers most appropriate provided it supports its decision with substantial evidence. The lead agency should explain the limitations of the particular model or methodology selected for use; and/or

(2) Rely on a qualitative analysis or performance based standards.

A lead agency should consider the following factors, among others, when assessing the significance of impacts from greenhouse gas emissions on the environment:

(1) The extent to which the project may increase or reduce greenhouse gas emissions as compared to the existing environmental setting;

(2) Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project.

(3) The extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of greenhouse gas emissions. Such requirements must be adopted by the relevant public agency through a public review process and must reduce or mitigate the project's incremental contribution of greenhouse

gas emissions. If there is substantial evidence that the possible effects of a particular project are still cumulatively considerable notwithstanding compliance with the adopted regulations or requirements, an EIR must be prepared for the project.

Different agencies and studies estimate different goals for reduction of emissions to achieve 1990 levels by the year 2020, as set forth in AB 32. Some agencies have estimated a reduction of 28 percent to 29 percent, based on the ARB's analysis that statewide 2020 business as usual GHG emissions would be 596 $MMTCO_2e$, with 1990 emissions of 427 $MMTCO_2e$, for a reduction of 28.35% (ARB 2010).

Projects that meet the criteria for conducting a climate change analysis are required to conduct a GHG inventory and disclose GHG emissions associated with project implementation and operation under "business as usual" conditions. "Business as usual" is defined as the emissions that would have occurred in the absence of reductions mandated under AB 32.

According to the California Energy Commission (CEC 2006), carbon dioxide (CO_2) accounts for approximately 84 percent of statewide greenhouse gas emissions, with methane accounting for approximately 5.7 percent of greenhouse gas emissions and nitrous oxide accounting for another 6.8 percent of greenhouse gas emissions. Other pollutants account for approximately 2.9 percent of greenhouse gas emissions in California. The transportation sector is the single largest category of California's greenhouse gas emissions, accounting for 41 percent of emissions statewide. In 2004, California produced 431 million metric tons of total carbon dioxide-equivalent emissions (not including energy imports).

The main source of greenhouse gas emissions associated with the ASPP would be combustion of fossil fuels during construction of the project. Emissions of GHG were calculated using the same approach as emissions for overall construction emissions discussed in Section 4.1. Estimated emissions of greenhouse gases are summarized in Table 12. Emission calculations are provided in Appendix A.

Table 12
Construction Greenhouse Gas Emissions

	CO_2	CH_4	N_2O
Emissions, metric tons/year			
Heavy Construction Equipment	244	0.03	0.24
Worker Vehicles	157	0.02	0.02
Construction Trucks	47	0.00	0.02
TOTAL	**448**	**0.04**	**0.28**
Global Warming Potential	**1**	**21**	**310**
CO_2 Equivalent	**448**	**1**	**87**
CO_2 Equivalent Total	**536**		

The total CO_2e emissions of 535 metric tons are below CAPCOA's recommended annual threshold of 900 metric tons of CO_2e, below which no analysis would be required. Emissions associated with construction would be temporary, likely to occur in only one one-year period. This level of GHG emissions would not result in a significant impact on global climate. Furthermore, because the Project would allow LADWP to generate additional solar power, it would serve meet LADWP's goals for the Renewable Portfolio Standard, which has been identified by the state as a means of meeting the goals of AB 32 to reduce emissions to 1990 levels by the year 2020. The project is therefore consistent with the goals of AB 32.

6.0 Cumulative Impacts

In analyzing cumulative impacts from a proposed project, the analysis must specifically evaluate a project's contribution to the cumulative increase in pollutants for which the project area is listed as "non-attainment" for the federal or state AAQS. In the event direct impacts from a project are less than significant, a project may still have a cumulatively considerable impact on air quality if the emissions from the project, in combination with the emissions from other proposed, or reasonably foreseeable future projects are in excess of screening levels identified above, and the project's contribution accounts for more than an insignificant proportion of the cumulative total emissions.

As discussed in Section 2.0, the Western Mojave Desert Area is considered a moderate nonattainment area for the 8-hour O_3 NAAQS; however, a large portion of O_3 exceedances in the

Western Mojave Desert Area are attributable to O_3 transport from the South Coast Air Basin. The area is also designated as a moderate nonattainment area for the NAAQS for PM_{10}. The Western Mojave Desert Area is considered a nonattainment area for the CAAQS for O_3, $PM_{2.5}$, and PM_{10}.

Because the project's emissions of O_3 precursors are mainly attributable to temporary construction activities, and because the project's direct emissions are below the MDAQMD's significance thresholds, the project would not result in a cumulatively considerable increase in nonattainment pollutants. Because the project would also provide renewable energy to the South Coast Air Basin, the project would reduce emissions within the South Coast Air Basin, thus lessening the amount of pollution available for transport to the Western Mojave Desert Area.

PM_{10} and $PM_{2.5}$ emissions associated with construction generally result in near-field impacts. Project construction emissions should be evaluated in consideration with other projects in the vicinity of the project (i.e., within one mile) to assess the potential for cumulative impacts due to PM_{10} emissions during construction. No additional projects have been identified that are likely to be under construction during the same timeframe as the ASPP that would result in cumulatively significant impacts due to particulate matter.

7.0 Conclusions and Recommendations

In summary, the proposed project would result in emissions of air pollutants for both the construction phase and operational phase of the project. The air quality impact analysis evaluated the potential for adverse impacts to the ambient air quality due to construction and operational emissions. Construction emissions would include emissions associated with fugitive dust, heavy construction equipment and construction workers commuting to and from the site. The emissions associated with construction would be less than the MDAQMD's significance thresholds under CEQA, and would therefore not result in a significant air quality impact.

Project operational emissions would be minor and would only be associated with inspection and maintenance activities. These activities would involve on-road vehicle travel, which would be periodic. Emissions from on-road vehicle travel would be minor.

The project would provide renewable energy to the LADWP and would therefore serve the purpose of assisting LADWP in meetings its goals for renewable energy as set forth in AB 32. The project would therefore not conflict with the goals of AB 32 in reducing emissions of GHG, and would result in a less than significant impact on global climate.

8.0 References

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Appendix A

Emission Calculations

Table A-1
Construction Heavy Equipment Emissions
Adelanto Solar Power Project

Adelanto Solar Power Project

			Emission Factors												Emissions									Emission, tons (total)								
Equipment and Month	**FUEL**	**HP**	**ROG (lb/hr)**	**CO (lb/hr)**	**NOX (lb/hr)**	**SOX (lb/hr)**	**PM10 (lb/hr)**	**PM2.5 (lb/hr)**	**CO2 (lb/hr)**	**CH4 (lb/hr)**	**N2O (lb/hr)**	**No of Equipment**	**Hrs Per Day**	**Days in Service**	**ROG lbs/day**	**CO lbs/day**	**NOX lbs/day**	**SOX lbs/day**	**PM10 lbs/day**	**PM2.5 lbs/day**	**CO2 lbs/day**	**CH4 lbs/day**	**N2O lbs/day**	**ROG tons (total)**	**CO tons (total)**	**NOX tons (total)**	**SOX tons (total)**	**PM10 tons (total)**	**PM2.5 tons (total)**	**CO2 tons (total)**	**CH4 tons (total)**	**N2O tons (total)**
August																																
4000 Gallon Water Truck	DIESEL	235	0.1639	0.4301	1.6150	0.0019	0.0574	0.0511252	166.5	0.0148	0.1534	1	4	21	0.66	1.72	6.46	0.01	0.23	0.20	666.18	0.06	0.61	0.007	0.018	0.068	0.000	0.002	0.002	7	0.001	0.006
CAT D8 Dozer	DIESEL	310	0.2913	1.1931	2.7255	0.0025	0.1101	0.0979504	259.2	0.0263	0.2589	2	4	21	2.33	9.55	21.80	0.02	0.88	0.78	2073.84	0.21	2.07	0.024	0.100	0.229	0.000	0.009	0.008	22	0.002	0.022
CAT 416 Rubber Tire Backhoe	DIESEL	87	0.0910	0.3623	0.5664	0.0006	0.0515	0.0458517	51.7	0.0082	0.0538	2	4	21	0.73	2.90	4.53	0.00	0.41	0.37	413.82	0.07	0.43	0.008	0.030	0.048	0.000	0.004	0.004	4	0.001	0.005
CAT 14H Motor Grader	DIESEL	215	0.1761	0.4934	1.7904	0.0019	0.0662	0.0589573	172.1	0.0159	0.1701	1	2	21	0.35	0.99	3.58	0.00	0.13	0.12	344.23	0.03	0.34	0.004	0.010	0.038	0.000	0.001	0.001	4	0.000	0.004
CAT 563 Roller	DIESEL	145	0.1478	0.6270	1.2022	0.0012	0.0659	0.0586278	108.1460	0.0133	0.1142	1	4	21	0.59	2.51	4.81	0.00	0.26	0.23	432.58	0.05	0.46	0.006	0.026	0.050	0.000	0.003	0.002	5	0.001	0.005
Compact Excavator	DIESEL	47	0.1131	0.3145	0.2638	0.0003	0.0276	0.0245475	25.0175	0.0102	0.0251	2	4	21	0.91	2.52	2.11	0.00	0.22	0.20	200.14	0.08	0.20	0.010	0.026	0.022	0.000	0.002	0.002	2	0.001	0.002
Cable Trencher	DIESEL	63	0.1509	0.4840	0.9082	0.0008	0.0776	0.0690492	64.8951	0.0136	0.0863	1	8	21	1.21	3.87	7.27	0.01	0.62	0.55	519.16	0.11	0.69	0.013	0.041	0.076	0.000	0.007	0.006	5	0.001	0.007
Subtotal															**6.77**	**24.05**	**50.56**	**0.05**	**2.76**	**2.46**	**4649.95**	**0.61**	**4.80**	**0.07**	**0.25**	**0.53**	**0.00**	**0.03**	**0.03**	**48.82**	**0.01**	**0.05**
September																																
4000 Gallon Water Truck	DIESEL	235	0.1639	0.4301	1.6150	0.0019	0.0574	0.0511252	166.5	0.0148	0.1534	1	4	21	0.66	1.72	6.46	0.01	0.23	0.20	666.18	0.06	0.61	0.007	0.018	0.068	0.000	0.002	0.002	7	0.001	0.006
Dump Trucks	DIESEL	235	0.1639	0.4301	1.6150	0.0019	0.0574	0.0511252	166.5	0.0148	0.1534	5	6	21	4.92	12.90	48.45	0.06	1.72	1.53	4996.36	0.44	4.60	0.052	0.135	0.509	0.001	0.018	0.016	52	0.005	0.048
CAT D8 Dozer	DIESEL	310	0.2913	1.1931	2.7255	0.0025	0.1101	0.0979504	259.2	0.0263	0.2589	2	4	21	2.33	9.55	21.80	0.02	0.88	0.78	2073.84	0.21	2.07	0.024	0.100	0.229	0.000	0.009	0.008	22	0.002	0.022
CAT 416 Rubber Tire Backhoe	DIESEL	87	0.0910	0.3623	0.5664	0.0006	0.0515	0.0458517	51.7	0.0082	0.0538	2	4	21	0.73	2.90	4.53	0.00	0.41	0.37	413.82	0.07	0.43	0.008	0.030	0.048	0.000	0.004	0.004	4	0.001	0.005
CAT 14H Motor Grader	DIESEL	215	0.1761	0.4934	1.7904	0.0019	0.0662	0.0589573	172.1	0.0159	0.1701	1	2	21	0.35	0.99	3.58	0.00	0.13	0.12	344.23	0.03	0.34	0.004	0.010	0.038	0.000	0.001	0.001	4	0.000	0.004
CAT 563 Roller	DIESEL	145	0.1478	0.6270	1.2022	0.0012	0.0659	0.0586278	108.1460	0.0133	0.1142	1	4	21	0.59	2.51	4.81	0.00	0.26	0.23	432.58	0.05	0.46	0.006	0.026	0.050	0.000	0.003	0.002	5	0.001	0.005
Compact Excavator	DIESEL	47	0.1131	0.3145	0.2638	0.0003	0.0276	0.0245475	25.0175	0.0102	0.0251	2	4	21	0.91	2.52	2.11	0.00	0.22	0.20	200.14	0.08	0.20	0.010	0.026	0.022	0.000	0.002	0.002	2	0.001	0.002
Cable Trencher	DIESEL	63	0.1509	0.4840	0.9082	0.0008	0.0776	0.0690492	64.8951	0.0136	0.0863	1	8	21	1.21	3.87	7.27	0.01	0.62	0.55	519.16	0.11	0.69	0.013	0.041	0.076	0.000	0.007	0.006	5	0.001	0.007
Subtotal															**11.69**	**36.95**	**99.01**	**0.11**	**4.48**	**3.99**	**9646.32**	**1.05**	**9.41**	**0.12**	**0.39**	**1.04**	**0.00**	**0.05**	**0.04**	**101.29**	**0.01**	**0.10**
October																																
4000 Gallon Water Truck	DIESEL	235	0.1639	0.4301	1.6150	0.0019	0.0574	0.0511252	166.5	0.0148	0.1534	1	4	21	0.66	1.72	6.46	0.01	0.23	0.20	666.18	0.06	0.61	0.007	0.018	0.068	0.000	0.002	0.002	7	0.001	0.006
CAT 416 Rubber Tire Backhoe	DIESEL	87	0.0910	0.3623	0.5664	0.0006	0.0515	0.0458517	51.7	0.0082	0.0538	2	4	21	0.73	2.90	4.53	0.00	0.41	0.37	413.82	0.07	0.43	0.008	0.030	0.048	0.000	0.004	0.004	4	0.001	0.005
Compact Excavator	DIESEL	47	0.1131	0.3145	0.2638	0.0003	0.0276	0.0245475	25.0175	0.0102	0.0251	2	4	21	0.91	2.52	2.11	0.00	0.22	0.20	200.14	0.08	0.20	0.010	0.026	0.022	0.000	0.002	0.002	2	0.001	0.002
Pitman Truck Crane	DIESEL	320	0.1821	0.6625	1.7722	0.0018	0.0685	0.0609636	180.1013	0.0164	0.1684	4	4	21	2.91	10.60	28.36	0.03	1.10	0.98	2881.62	0.26	2.69	0.031	0.111	0.298	0.000	0.012	0.010	30	0.003	0.028
Cable Trencher	DIESEL	63	0.1509	0.4840	0.9082	0.0008	0.0776	0.0690492	64.8951	0.0136	0.0863	1	8	21	1.21	3.87	7.27	0.01	0.62	0.55	519.16	0.11	0.69	0.013	0.041	0.076	0.000	0.007	0.006	5	0.001	0.007
Subtotal															**6.41**	**21.61**	**48.72**	**0.05**	**2.58**	**2.30**	**4680.93**	**0.58**	**4.63**	**0.07**	**0.23**	**0.51**	**0.00**	**0.03**	**0.02**	**49.15**	**0.01**	**0.05**
November																																
CAT 416 Rubber Tire Backhoe	DIESEL	87	0.0910	0.3623	0.5664	0.0006	0.0515	0.0458517	51.7	0.0082	0.0538	2	4	21	0.73	2.90	4.53	0.00	0.41	0.37	413.82	0.07	0.43	0.008	0.030	0.048	0.000	0.004	0.004	4	0.001	0.005
Pitman Truck Crane	DIESEL	320	0.1821	0.6625	1.7722	0.0018	0.0685	0.0609636	180.1013	0.0164	0.1684	4	4	21	2.91	10.60	28.36	0.03	1.10	0.98	2881.62	0.26	2.69	0.031	0.111	0.298	0.000	0.012	0.010	30	0.003	0.028
Subtotal															**3.64**	**13.50**	**32.89**	**0.03**	**1.51**	**1.34**	**3295.44**	**0.33**	**3.12**	**0.04**	**0.14**	**0.35**	**0.00**	**0.02**	**0.01**	**34.60**	**0.00**	**0.03**
December																																
CAT 416 Rubber Tire Backhoe	DIESEL	87	0.0910	0.3623	0.5664	0.0006	0.0515	0.0458517	51.7	0.0082	0.0538	2	4	21	0.73	2.90	4.53	0.00	0.41	0.37	413.82	0.07	0.43	0.008	0.030	0.048	0.000	0.004	0.004	4	0.001	0.005
Pitman Truck Crane	DIESEL	320	0.1821	0.6625	1.7722	0.0018	0.0685	0.0609636	180.1013	0.0164	0.1684	4	4	21	2.91	10.60	28.36	0.03	1.10	0.98	2881.62	0.26	2.69	0.031	0.111	0.298	0.000	0.012	0.010	30	0.003	0.028
Subtotal															**3.64**	**13.50**	**32.89**	**0.03**	**1.51**	**1.34**	**3295.44**	**0.33**	**3.12**	**0.04**	**0.14**	**0.35**	**0.00**	**0.02**	**0.01**	**34.60**	**0.00**	**0.03**
																							Total	**0.34**	**1.15**	**2.77**	**0.00**	**0.13**	**0.12**	**268.46**	**0.03**	**0.26**

Table A-2
Construction Worker Commute Emission Calculations
Adelanto Solar Power Project

Construction Month	Vehicle Class	No. of Daily Workers Per Construction Phase	Speed (mph)	VMT (mi/veh/day)	CO Running Exhaust lb/mi	CO Start-Up lb/start[a]	NO_x Running Exhaust lb/mi	NO_x Start-Up lb/start[a]	ROG Running Exhaust lb/mi	ROG Start-Up lb/start[a]	ROG Hot-Soak lb/trip	ROG Resting Loss lb/hot	ROG Running Evaporative lb/mi	ROG Diurnal Evaporative lb/hr	SOx Running Exhaust lb/mi	SOx Start-Up lb/start[a]	PM10 Running Exhaust lb/mi	PM10 Start-Up lb/start[a]	PM10 Tire Wear lb/mi	PM10 Brake Wear lb/mi	PM2.5 Running Exhaust lb/mi	PM2.5 Start-Up lb/start[a]	PM2.5 Tire Wear lb/mi	PM2.5 Brake Wear lb/mi	CO2 Running Exhaust lb/mi	CO2 Start-Up lb/start[a]	CH4 Running Exhaust lb/mi	CH4 Start-Up lb/start[a]	N2O Running Exhaust lb/mi	N2O Start-Up lb/start[a]
August	Light-Duty Truck, catalyst	30	35	80	4.551	16.206	0.534	0.763	0.123	1.021	0.229	0.034	0.055	0.073	0.004	0.002	0.014	0.02	0.008	0.013	0.013	0.019	0.002	0.005	385.25	204.8	0.036	0.068	0.05	0.07
September	Light-Duty Truck, catalyst	30	35	80	4.551	16.206	0.534	0.763	0.123	1.021	0.229	0.034	0.055	0.073	0.004	0.002	0.014	0.02	0.008	0.013	0.013	0.019	0.002	0.005	385.25	204.8	0.036	0.068	0.05	0.07
October	Light-Duty Truck, catalyst	60	35	80	4.551	16.206	0.534	0.763	0.123	1.021	0.229	0.034	0.055	0.073	0.004	0.002	0.014	0.02	0.008	0.013	0.013	0.019	0.002	0.005	385.25	204.8	0.036	0.068	0.05	0.07
November	Light-Duty Truck, catalyst	60	35	80	4.551	16.206	0.534	0.763	0.123	1.021	0.229	0.034	0.055	0.073	0.004	0.002	0.014	0.02	0.008	0.013	0.013	0.019	0.002	0.005	385.25	204.8	0.036	0.068	0.05	0.07
December	Light-Duty Truck, catalyst	60	35	80	4.551	16.206	0.534	0.763	0.123	1.021	0.229	0.034	0.055	0.073	0.004	0.002	0.014	0.02	0.008	0.013	0.013	0.019	0.002	0.005	385.25	204.8	0.036	0.068	0.05	0.07

Assume startup after 8 hours
Assume 45 minutes run time total

Total Vehicle Emissions

Emissions lbs/day

	CO	NO_x	VOCs	SOx	PM10	PM2.5	Paved Road Fugitive Dust PM10	Paved Road Fugitive Dust PM2.5	CO2	CH4	N2O
	26.22	2.93	1.05	0.02	0.19	0.11	0.25	0.05	2065.50	0.20	0.28
	26.22	2.93	1.05	0.02	0.19	0.11	0.25	0.05	2065.50	0.20	0.28
	52.45	5.85	2.10	0.04	0.38	0.22	0.51	0.11	4130.99	0.40	0.56
	52.45	5.85	2.10	0.04	0.38	0.22	0.51	0.11	4130.99	0.40	0.56
	52.45	5.85	2.10	0.04	0.38	0.22	0.51	0.11	4130.99	0.40	0.56
Max Day	**52.45**	**5.85**	**2.10**	**0.04**	**0.38**	**0.22**	**0.51**	**0.11**	**4130.99**	**0.40**	**0.56**

Construction Days	Total Emissions tons CO	NO_x	VOCs	SOx	PM10	PM2.5	Paved Road Fugitive Dust PM10	Paved Road Fugitive Dust PM2.5	CO2	CH4	N2O
21	0.28	0.03	0.01102	2.29E-04	0.00197	0.00114	0.00266	0.00056	22	0.00209	0.00292
21	0.28	0.03	0.01102	2.29E-04	0.00197	0.00114	0.00266	0.00056	22	0.00209	0.00292
21	0.55	0.06	0.02204	4.58E-04	0.00394	0.00228	0.00532	0.00112	43	0.00419	0.00584
21	0.55	0.06	0.02204	4.58E-04	0.00394	0.00228	0.00532	0.00112	43	0.00419	0.00584
21	0.55	0.06	0.02204	4.58E-04	0.00394	0.00228	0.00532	0.00112	43	0.00419	0.00584
Total	**2.20**	**0.25**	**0.09**	**0.00**	**0.02**	**0.01**	**0.02**	**0.00**	**173.58**	**0.02**	**0.02**

Table A-3
Construction Truck Trip Emissions
Adelanto Solar Power Project

Vehicle	Vehicle Class	Peak No. of Trucks per day	Speed (mph)	VMT (mi/vehicle-day)	CO Running Exhaust (g/mi)	NO_x Running Exhaust (g/mi)	ROG Running Exhaust (g/mi)	SOx Running Exhaust (g/mi)	PM10 Running Exhaust (g/mi)	PM10 Tire Wear (g/mi)	PM10 Brake Wear (g/mi)	PM2.5 Running Exhaust (g/mi)	PM2.5 Tire Wear (g/mi)	PM2.5 Brake Wear (g/mi)	CO2 Running Exhaust (g/mi)	CH4 Running Exhaust (g/mi)	N2O Running Exhaust (g/mi)	Emissions, lbs/day: CO	NOx	VOCs	SOx	PM10	PM2.5	Paved Road Fugitive Dust PM10	Paved Road Fugitive Dust PM2.5	Unpaved Road Fugitive Dust PM10	Unpaved Road Fugitive Dust PM2.5	CO2	CH4	N2O	Construction Days/Total Deliveries	Total Emissions, tons: CO	NOx	VOCs	SOx	PM10	PM2.5	Paved Road Fugitive Dust PM10	Paved Road Fugitive Dust PM2.5	Unpaved Road Fugitive Dust PM10	Unpaved Road Fugitive Dust PM2.5	CO2	CH4	N2O
On-Site, August-December																																										
3/4 Ton Truck, Pick-Up	Light Duty Truck 1, Diesel	6	15	60	1.081	1.586	0.129	0.003	0.083	0.008	0.013	0.077	0.002	0.005	346.632	0.006	0.15	0.86	1.26	0.10	0.00	0.08	0.07	0.04	0.01	0.54	0.05	275.11	0.00	0.12	105	0.05	0.07	0.00538	1.25E-04	0.00433	0.00350	0.00204	0.00043	0.02814	0.00281	14	0.00025	0.00628
1 Ton Truck, Pick-Up	Light Duty Truck 1, Diesel	4	15	60	1.081	1.586	0.129	0.003	0.083	0.008	0.013	0.077	0.002	0.005	346.632	0.006	0.15	0.57	0.84	0.07	0.00	0.06	0.04	0.03	0.01	0.36	0.04	183.41	0.00	0.08	105	0.03	0.04	0.00358	8.33E-05	0.00289	0.00233	0.00136	0.00029	0.01875	0.00188	10	0.00017	0.00419
Subtotal																		**1.43**	**2.10**	**0.17**	**0.00**	**0.14**	**0.11**	**0.06**	**0.01**	**0.89**	**0.09**	**458.52**	**0.01**	**0.20**		**0.08**	**0.11**	**0.01**	**0.00**	**0.01**	**0.01**	**0.00**	**0.00**	**0.05**	**0.00**	**24.07**	**0.00**	**0.01**
August																																											
Deliveries																																											
Truck, Concrete, 10 Yd	Medium Duty Truck, Diesel	2	35	80	4.197	8.595	0.413	0.014	0.49	0.012	0.013	0.451	0.003	0.005	1505	0.019	0.82	1.48	3.03	0.15	0.00	0.18	0.16	1.54	0.32	0.41	0.04	530.88	0.01	0.29	15	0.01	0.01	0.00	0.00	0.00	0.00	0.01154	0.00242	0.00311	0.00031	4	0.00005	0.00216
Subtotal																		**1.48**	**3.03**	**0.15**	**0.00**	**0.18**	**0.16**	**1.54**	**0.32**	**0.41**	**0.04**	**530.88**	**0.01**	**0.29**		**0.01**	**0.01**	**0.00**	**0.00**	**0.00**	**0.00**	**0.01**	**0.00**	**0.00**	**0.00**	**3.88**	**0.00**	**0.02**
September																																											
Deliveries																																											
Truck, Flatbed, 2 Ton	Light Duty Truck 2, Diesel	4	35	80	1.309	1.544	0.215	0.003	0.153	0.008	0.013	0.141	0.002	0.005	352.391	0.01	0.15	0.92	1.09	0.15	0.00	0.12	0.10	0.03	0.01	0.36	0.04	248.61	0.01	0.10	33	0.00	0.00	0.00	0.00	0.00	0.00	0.00556	0.00012	0.00590	0.00059	4	0.00012	0.00171
Truck, Concrete, 10 Yd	Medium Duty Truck, Diesel	2	35	80	4.197	8.595	0.413	0.014	0.49	0.012	0.013	0.451	0.003	0.005	1505	0.019	0.82	1.48	3.03	0.15	0.00	0.18	0.16	1.54	0.32	0.41	0.04	530.88	0.01	0.29	15	0.01	0.01	0.00	0.00	0.00	0.00	0.01154	0.00242	0.00311	0.00031	4	0.00005	0.00216
Dump Trucks	Heavy Duty Truck, Diesel	4	35	80	4.281	15.344	0.83	0.017	0.483	0.028	0.036	0.444	0.009	0.012	1827.808	0.039	1.46	3.02	10.82	0.59	0.01	0.39	0.33	1.08	0.65	0.83	0.08	1289.49	0.03	1.03	24	0.01	0.03	0.00	0.00	0.00	0.00	0.03692	0.00775	0.00996	0.00100	15	0.00033	0.01234
Subtotal																		**2.40**	**4.12**	**0.30**	**0.01**	**0.30**	**0.27**	**1.57**	**0.33**	**0.77**	**0.08**	**779.48**	**0.01**	**0.39**		**0.01**	**0.02**	**0.00**	**0.00**	**0.00**	**0.00**	**0.01**	**0.00**	**0.01**	**0.00**	**8.08**	**0.00**	**0.00**
October																																											
Deliveries																																											
Truck, Flatbed, 2 Ton	Light Duty Truck 2, Diesel	4	35	80	1.309	1.544	0.215	0.003	0.153	0.008	0.013	0.141	0.002	0.005	352.391	0.01	0.15	0.92	1.09	0.15	0.00	0.12	0.10	0.03	0.01	0.36	0.04	248.61	0.01	0.10	33	0.00	0.00	0.00	0.00	0.00	0.00	0.00556	0.00012	0.00590	0.00059	4	0.00012	0.00171
Truck, Concrete, 10 Yd	Medium Duty Truck, Diesel	2	35	80	4.197	8.595	0.413	0.014	0.49	0.012	0.013	0.451	0.003	0.005	1505	0.019	0.82	1.48	3.03	0.15	0.00	0.18	0.16	1.54	0.32	0.41	0.04	530.88	0.01	0.29	15	0.01	0.01	0.00	0.00	0.00	0.00	0.01154	0.00242	0.00311	0.00031	4	0.00005	0.00216
Subtotal																		**2.40**	**4.12**	**0.30**	**0.01**	**0.30**	**0.27**	**1.57**	**0.33**	**0.77**	**0.08**	**779.48**	**0.01**	**0.39**		**0.01**	**0.02**	**0.00**	**0.00**	**0.00**	**0.00**	**0.01**	**0.00**	**0.01**	**0.00**	**8.08**	**0.00**	**0.00**
November																																											
Deliveries																																											
Truck, Flatbed, 2 Ton	Light Duty Truck 2, Diesel	4	35	80	1.309	1.544	0.215	0.003	0.153	0.008	0.013	0.141	0.002	0.005	352.391	0.01	0.15	0.92	1.09	0.15	0.00	0.12	0.10	0.03	0.01	0.36	0.04	248.61	0.01	0.10	33	0.00	0.00	0.00	0.00	0.00	0.00	0.00556	0.00012	0.00590	0.00059	4	0.00012	0.00171
Truck, Concrete, 10 Yd	Medium Duty Truck, Diesel	2	35	80	4.197	8.595	0.413	0.014	0.49	0.012	0.013	0.451	0.003	0.005	1505	0.019	0.82	1.48	3.03	0.15	0.00	0.18	0.16	1.54	0.32	0.41	0.04	530.88	0.01	0.29	15	0.01	0.01	0.00	0.00	0.00	0.00	0.01154	0.00242	0.00311	0.00031	4	0.00005	0.00216
Subtotal																		**2.40**	**4.12**	**0.30**	**0.01**	**0.30**	**0.27**	**1.57**	**0.33**	**0.77**	**0.08**	**779.48**	**0.01**	**0.39**		**0.01**	**0.02**	**0.00**	**0.00**	**0.00**	**0.00**	**0.01**	**0.00**	**0.01**	**0.00**	**8.08**	**0.00**	**0.00**
																														Total	**0.11**	**0.17**	**0.01**	**0.00**	**0.01**	**0.01**	**0.05**	**0.01**	**0.08**	**0.01**	**52.30**	**0.00**	**0.02**

2010 Emission Factors from EMFAC2007,
average term 60F, Mojave Desert

Paved Road Fugitive Dust
EPA's AP-42, Section 13.2.1, November 2006
E = k(sL/2)^0.65 x (W/3)^1.5 - C
For LDT assume 2 tons/vehicle, MDT assume 13 tons/vehicle, HDT assume 20 tons/vehicle
Assume silt loading for 10,000 ADT roadways = 0.03 g/m3
Assume k = 0.016 PM10
Assume 6 miles in addition for track-out for PM10
Emission Factors

PM10, LDT	9.81231E-05
PM10, MDT	0.008944829
PM10, HDT	0.017495628

Unpaved Road Fugitive Dust
EPA's AP-42, Section 13.2.2
Industrial Roads
E = k (s/12)^a x (W/3)^b
For LDT assume 2 tons/vehicle, MDT assume 13 tons/vehicle, HDT assume 20 tons/vehicle
k = 1.5 for PM10, 0.15 for PM2.5
s = 8.5, a = 0.9, b = 0.45
Assume 61% control efficiency for watering 3x daily
Emission Factors

PM10, LDT	0.357378738
PM10, MDT	0.829735596
PM10, HDT	1.007230136
PM2.5, LDT	0.035737874
PM2.5, MDT	0.08297356
PM2.5, HDT	0.100723014

Assume 0.25 miles each way of unpaved road travel

Table A-4
Fugitive Dust Emission Calculations
Adelanto Solar Power Project

Activity Assumptions for Fugitive Dust Sources	
Acreage of Disturbance	42.5
Amount per day (assume 10% per day)	4.25
Emission Factor (uncontrolled), lbs/acre-day	20
Emissions, uncontrolled, lbs/day	85
Control Efficiency	0.61
Emissions, controlled, lbs/day	33.15
Emissions, uncontrolled, tons/year	2.6775
Control Efficiency	0.61
Emissions, controlled, tons/year	1.044225

Table A-5
Construction Emission Summary
Adelanto Solar Power Project

Summary

	Emissions									Emission, tons (total)								
August	**ROG lbs/day**	**CO lbs/day**	**NOX lbs/day**	**SOX lbs/day**	**PM10 lbs/day**	**PM2.5 lbs/day**	**CO2 lbs/day**	**CH4 lbs/day**	**N2O lbs/day**	**ROG tons (total)**	**CO tons (total)**	**NOX tons (total)**	**SOX tons (total)**	**PM10 tons (total)**	**PM2.5 tons (total)**	**CO2 tons (total)**	**CH4 tons (total)**	**N2O tons (total)**
Emissions, lbs/day																		
Heavy Construction Equipment	6.77	24.05	50.56	0.05	2.76	2.46	4649.95	0.61	4.80	0.34	1.15	2.77	0.00	0.13	0.12	243.55	0.03	0.24
Worker Vehicles	1.05	26.22	2.93	0.02	0.44	0.16	2065.50	0.20	0.28	0.09	2.20	0.25	0.00	0.04	0.01	157.40	0.02	0.02
Construction Trucks	0.32	2.91	5.13	0.01	3.23	0.74	989.39	0.01	0.49	0.01	0.11	0.17	0.00	0.14	0.02	47.45	0.00	0.02
Fugitive Dust					33.15	6.9615								1.044225	0.219287			
Total Daily	**8.14**	**53.18**	**58.62**	**0.08**	**39.58**	**10.32**	**7704.84**	**0.82**	**5.57**	**0.44**	**3.46**	**3.19**	**0.00**	**1.36**	**0.38**	**448.40**	**0.04**	**0.28**
Significance Threshold	*137*	*548*	*137*	*137*	*82*	*82*	*N/A*	*N/A*	*N/A*	*25*	*100*	*25*	*137*	*15*	*15*	*N/A*	*N/A*	*N/A*
Above Threshold?	No	No	No	No	No	No	N/A	N/A	N/A	No	No	No	No	No	No	N/A	N/A	N/A
Reduction Required:			0.427864															
														Metric Tons		448.40	0.04	0.28

September	**ROG lbs/day**	**CO lbs/day**	**NOX lbs/day**	**SOX lbs/day**	**PM10 lbs/day**	**PM2.5 lbs/day**	**CO2 lbs/day**	**CH4 lbs/day**	**N2O lbs/day**
Emissions, lbs/day									
Heavy Construction Equipment	11.69	36.95	99.01	0.11	4.48	3.99	9646.32	1.05	9.41
Worker Vehicles	1.05	26.22	2.93	0.02	0.44	0.16	2065.50	0.20	0.28
Construction Trucks	0.47	3.83	6.22	0.01	3.74	0.89	1238.00	0.02	0.59
Fugitive Dust					33.15	6.9615			
Total Daily	**13.20**	**67.01**	**108.16**	**0.14**	**41.82**	**12.00**	**12949.81**	**1.28**	**10.27**
Significance Threshold	*137*	*548*	*137*	*137*	*82*	*82*	*N/A*	*N/A*	*N/A*
Above Threshold?	No	No	No	No	No	No	N/A	N/A	N/A

October	**ROG lbs/day**	**CO lbs/day**	**NOX lbs/day**	**SOX lbs/day**	**PM10 lbs/day**	**PM2.5 lbs/day**	**CO2 lbs/day**	**CH4 lbs/day**	**N2O lbs/day**
Emissions, lbs/day									
Heavy Construction Equipment	6.41	21.61	48.72	0.05	2.58	2.30	4680.93	0.58	4.63
Worker Vehicles	2.10	52.45	5.85	0.04	0.88	0.32	4130.99	0.40	0.56
Construction Trucks	0.47	3.83	6.22	0.01	3.74	0.89	1238.00	0.02	0.59
Fugitive Dust					33.15	6.9615			
Total Daily	**8.98**	**77.89**	**60.80**	**0.10**	**40.36**	**10.47**	**10049.92**	**1.00**	**5.78**
Significance Threshold	*137*	*548*	*137*	*137*	*82*	*82*	*N/A*	*N/A*	*N/A*
Above Threshold?	No	No	No	No	No	No	N/A	N/A	N/A

November	**ROG lbs/day**	**CO lbs/day**	**NOX lbs/day**	**SOX lbs/day**	**PM10 lbs/day**	**PM2.5 lbs/day**	**CO2 lbs/day**	**CH4 lbs/day**	**N2O lbs/day**
Emissions, lbs/day									
Heavy Construction Equipment	3.64	13.50	32.89	0.03	1.51	1.34	3295.44	0.33	3.12
Worker Vehicles	2.10	52.45	5.85	0.04	0.88	0.32	4130.99	0.40	0.56
Construction Trucks	0.47	3.83	6.22	0.01	3.74	0.89	1238.00	0.02	0.59
Fugitive Dust					33.15	6.9615			
Total Daily	**6.21**	**69.78**	**44.96**	**0.09**	**39.28**	**9.51**	**8664.43**	**0.75**	**4.27**
Significance Threshold	*137*	*548*	*137*	*137*	*82*	*82*	*N/A*	*N/A*	*N/A*
Above Threshold?	No	No	No	No	No	No	N/A	N/A	N/A

December	**ROG lbs/day**	**CO lbs/day**	**NOX lbs/day**	**SOX lbs/day**	**PM10 lbs/day**	**PM2.5 lbs/day**	**CO2 lbs/day**	**CH4 lbs/day**	**N2O lbs/day**
Emissions, lbs/day									
Heavy Construction Equipment	3.64	13.50	32.89	0.03	1.51	1.34	3295.44	0.33	3.12
Worker Vehicles	2.10	52.45	5.85	0.04	0.88	0.32	4130.99	0.40	0.56
Fugitive Dust					33.15	6.9615			
Total Daily	**5.74**	**65.95**	**38.74**	**0.08**	**35.54**	**8.63**	**7426.43**	**0.73**	**3.68**
Significance Threshold	*137*	*548*	*137*	*137*	*82*	*82*	*N/A*	*N/A*	*N/A*
Above Threshold?	No	No	No	No	No	No	N/A	N/A	N/A

Maintenance Activities	**ROG lbs/day**	**CO lbs/day**	**NOX lbs/day**	**SOX lbs/day**	**PM10 lbs/day**	**PM2.5 lbs/day**	**CO2 lbs/day**	**CH4 lbs/day**	**N2O lbs/day**
Emissions, lbs/day									
Construction Trucks	0.22	1.50	1.93	0.00	0.95	0.23	432.01	0.01	0.18
Total Daily	**0.22**	**1.50**	**1.93**	**0.00**	**0.95**	**0.23**	**432.01**	**0.01**	**0.18**
Significance Threshold	*137*	*548*	*137*	*137*	*82*	*82*	*N/A*	*N/A*	*N/A*
Above Threshold?	No	No	No	No	No	No	N/A	N/A	N/A

APPENDIX 3
BIOLOGICAL SURVEY REPORTS

May 2010

ADELANTO SOLAR POWER PROJECT

Biological Resources Assessment
San Bernardino County, California

PROJECT NUMBER:
119485

PROJECT CONTACT:
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POWER ENGINEERS

Adelanto Solar Power Project

Biological Resources Assessment

PREPARED FOR: LOS ANGELES DEPARTMENT OF WATER AND POWER
111 NORTH HOPE STREET
LOS ANGELES, CA 90012

PREPARED BY: POWER ENGINEERS, INC.
731 E. BALL ROAD, SUITE 100
ANAHEIM, CA 92805

MELISSA LIPPINCOTT
TOM HERZOG

REVISION HISTORY		
DATE	**REVISED BY**	**REVISION**
5-12-10	TCR	1
5-13-2010	THE	1A – comment response

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1.0 INTRODUCTION

The Los Angeles Department of Water and Power (LADWP) proposes to construct a solar photovoltaic (PV) generation facility (Adelanto Solar Power Project [Project]) next to the existing LADWP Adelanto Switching Station. The Project has the potential to affect biological resources, including plants and wildlife, the ecological communities they occupy, and habitat suitable to support federal and state protected species. Through proper planning, impact avoidance, mitigation, and coordination with resource management agencies, development of the Project would occur in compliance with applicable regulations, thus minimizing or reducing to less-than-significant the negative impacts to biological resources.

Project elements with the potential to affect biological resources include site grading and vegetation removal, the construction of PV panel support structures, access roads, and operation. The site is within an existing utility in a heavy industrial parcel that is enclosed by a chain link fence. The fence has gaps at the point of soil contact, there are drainage culverts linked to adjacent native habitat, and there are access gates creating a partially obstructed site in respect to terrestrial wildlife movement.

The facility parcel is located in an area of desert habitat that supports areas of recent urbanization, a former military base, commercial zoning, and a mix of parcels supporting native habitat and parcels converted for urban and residential use.

1.1 PROJECT DESCRIPTION

LADWP proposes to build, own, and operate a photovoltaic solar power generation facility that will provide electricity to the City of Los Angeles, California. The Project will be located in the City of Adelanto, San Bernardino County, California, within a parcel owned by LADWP that currently supports the Adelanto Switching Station. The Project will be built to the south and west of the existing facility. Construction of the Project will necessitate removal of most vegetation within the 42.5 acre site, which is to the south of the main switching yard facility. The site is within a larger parcel that is enclosed by chain link fence and bound by paved County roads to all sides. The parcel is within an area of mixed parcels supporting native habitat and parcels disturbed by previous grading or converted to commercial, light industrial, or residential use. The Project is in the area to the south of the Logistic Air Base, which was formerly George Air Force Base.

The Project location is mapped in the State Plane, Adelanto quadrangle, R, T, Section of the U.S. Geological Service 7.5 minute Series. The general site coordinates are 34° 32’51”N and 117°26’27”W. The Project area is generally identified as being on a level grade at an elevation of approximately 2,990 feet above mean sea level. The site is expected to drain to County maintained roads and ditches that flow to the Mojave River.

The Project limits do not support defined Waters of the U.S., wetlands, or vernal features. The Project includes constructed ditches, berms, gabion-type erosion barriers, and detention basins to capture and direct surface stormwater around the existing switching station facility.

2.0 LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

The following section describes the primary laws, ordinances, regulations, and standards (LORS) relevant to biological resources within the Project area, and identifies the agencies responsible for compliance.

2.1 FEDERAL LORS

Federal Endangered Species Act (16 U.S.C. §1531 et seq.)

The federal Endangered Species Act (ESA) provides provisions for the protection of species listed as threatened or endangered as well as their designated critical habitats. It prohibits the "take" of listed species; however, "incidental take" as the result of otherwise legal project activities may be authorized pursuant to ESA Section 7 (with federal project nexus) or Section 10. Section 10 provides provisions for the development of habitat conservation plans. The United States Fish and Wildlife Service (USFWS) advises that proposed and candidate species may be listed at any time and should be considered during project planning.

ESA administration is managed by the USFWS for terrestrial species and the National Marine Fisheries Service for species with a significant marine life history component.

The **Migratory Bird Treaty Act (16 U.S.C. § 703 - 711)** affords protection to 836 species of migratory birds, including waterfowl, shorebirds, seabirds, wading birds, non-migratory upland game birds, raptors and passerines (including crows and ravens), their eggs and occupied nests. The Migratory Bird Treaty Act is administered by USFWS.

The **Bald and Golden Eagle Protection Act (16 U.S.C. § 668)** specifically protects bald and golden eagles from harm or trade of nests, eggs, and body parts of these species. The Bald and Golden Eagle Protection Act is administered by USFWS.

2.2 STATE LORS

California Endangered Species Act (Fish and Game Code Section 2050 et seq.)

The California Endangered Species Act (CESA) and implementing regulations in the Fish and Game Code, §2050 through §2098, include provisions for the protection and management of plant and animal species listed as endangered or threatened, or designated as candidates for such listing. CESA includes a consultation requirement "to ensure that any action authorized by a state lead agency is not likely to jeopardize the continued existence of any endangered or threatened species…or result in the destruction or adverse modification of habitat essential to the continued existence of the species" (§2090). Plants of California declared to be endangered, threatened, or rare are listed at 14 CCR §670.2. Animals of California declared to be endangered or threatened are listed at 14 CCR §670.5. Section §15000 *et seq.* of 14 CCR describes the types and extent of information required to evaluate the effects of a proposed project on the biological resources of a project site.

Fish and Game Code Sections 3511, 4700, 5050, and 5515 describe fish, amphibian, reptile, bird and mammal species that are "fully protected." Fully protected birds may not be taken or possessed, except under specific permit requirements. Administration of the code is through the California Department of Fish and Game (CDFG).

Fish and Game Code Section 3503 makes it unlawful to take, possess, or destroy any birds of prey or to take, possess, or destroy the nest or eggs of any such bird. Administration of the code is through CDFG.

Fish and Game Code Section 3513 states that it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto. Administration of the code is through CDFG.

Fish and Game Code Sections 1900 et seq., the California Native Plant Protection Act of 1977, protects rare plants listed as threatened, endangered, and rare. It defines specific protection measures for identified populations. Administration of the code is through CDFG.

Title 14, California Code of Regulations (Sections 670.2 and 670.5)

Title 14, California Code of Regulations (Sections 670.2 and 670.5) lists animals designated as threatened or endangered in California. Administration of the code is through CDFG.

California Fish and Game Code Sections 1601–1607

California Fish and Game Code Sections 1601–1607 prohibit alteration of any stream, including intermittent and seasonal channels and many artificial channels, without a Streambed Alteration Agreement from CDFG. This applies to any channel modifications that would be required to meet drainage, transportation, or flood control objectives of a project. Administration of the code is through CDFG.

California Environmental Quality Act (CEQA)

The California Environmental Quality Act (CEQA) (Public Resources Code Section 15380) defines "rare" in a broader sense than CESA and CDFG definitions of threatened, endangered, or species of special concern. Under this definition, CDFG can request additional consideration of species not otherwise protected. CEQA requires that the effects of a project on environmental resources be analyzed and assessed using criteria determined by the lead agency.

2.3 LOCAL LORS

Joshua tree (*Yucca Brevifolia*) is a conserved plant within California's desert areas and there are Joshua trees on the Project site. Various protection ordinances and regulations are established at several levels of government requiring permits for removal and/or transplantation of Joshua trees, including the City of Adelanto (Native Vegetation Removal Permit), County of San Bernardino (San Bernardino County Code, Title 8, Division 8, Section 88.01.050), and State of California (Food and Agriculture Code, Division 23, Chapter 5, Section 80001). As a government agency and municipal utility, LADWP is exempt from obtaining permits for native plant removal. The exemption is explicitly stated in both San Bernardino and State of California codes.

There are no Habitat Conservation Plans or other specific local LORS that apply to the Project.

3.0 ENVIRONMENTAL SETTING AND CURRENT CONDITION

The following sections describe the biological conditions of the Adelanto Solar Power Project area. This discussion includes a regional overview, survey methods, the vegetation types and habitat present in the Project area, a description of wildlife typical to the area, and a discussion of specific special-status species known or having the potential to occur in the general region.

The Project is located in the Mojave Desert in western San Bernardino County. The area receives little rainfall and has temperatures ranging from below freezing in the winter to over 100°F (38°C) during summer. The region experiences high winds frequently throughout the year. The Cajon Pass is located to the south, and the Interstate 15 corridor is a prominent feature to the east of the site, adjacent to State Route 395. The area is bound by the San Gabriel and San Bernardino Mountains to the south. The Project area is generally located along the Mojave River watershed.

3.1 FIELD METHODS

Field surveys were conducted in April, 2010 for the evaluation of biological resources in support of a Biological Assessment. Surveys included the proposed facility site, the remaining open space within the Adelanto Switching Yard parcel, and accessible open lands within approximately 0.25 mile (0.4 km) of the parcel that had the potential to support protected wildlife species. A thorough pedestrian survey was conducted at the Project site and a combination of pedestrian and windshield (driving) surveys were conducted in adjacent Project areas. Surveys were completed during suitable seasonal conditions to observe annual and perennial plant species and blooms, and migratory and resident bird species. No night surveys were conducted.

The survey included a protocol level focused survey for desert tortoise (*Gopherus agassizi*). Transects were walked by two experienced desert tortoise biologists with experience finding live tortoise and its sign in similar habitat. The site is generally level with clear ground visibility. Transects were spaced approximately 45 feet (15 meters) apart. The biologists were able to visually inspect the parcel areas of native vegetation within the facility perimeter chain link fence. Survey conditions included temperatures ranging from 70°F (21°C) to 80°F (27°C), and clear to partially cloudy skies with light winds. Seasonal temperatures were generally cooler than average, but suitable annuals were blooming and temperatures were considered suitable for tortoise activity if present. Scat from other species was observed, including recent lizard scat and old, weathered rabbit and coyote scat.

No focused survey or trapping was conducted for small mammals.

Joshua tree locations were mapped using a handheld global positioning system. Locations of observed trees are presented in Figure 1. The northeast quadrant of the facility parcel supports Joshua trees that are not shown on the figure because this area is not within the planned or potential work limits.

Habitat in the vicinity of the proposed Project site was surveyed at the reconnaissance level to identify wildlife habitat and the potential for occurrence of sensitive wildlife species.

A list of plant and wildlife species and their locations was compiled from all surveys. No herbarium collections were made because no sensitive species or potentially sensitive species were observed.

Field data were compared to descriptions of established ecological community types for the vicinity to identify community types in the Project survey area. All areas were assessed for their potential to support rare and special-status plant species, and special-status wildlife species.

The field surveys were aided by aerial photographs, which helped identify structures, land use, and potential existing natural habitat areas. The presence, or potential presence, of sensitive biological resources was determined from information gathered during field surveys conducted for the Project and a California Natural Diversity Database (CNDDB) search of U.S. Geological Survey (USGS) quadrangles encompassing of the Project area. A listof observed plant species is presented in Appendix A.

3.2 VEGETATION COMMUNITIES

3.2.1. Vegetation Description

Vegetation at the Adelanto Solar Project Site supports Joshua Tree Woodland and Mojave Creosote Bush Scrub (Holland 1986), equivalent to the *Yucca Brevifolia* Woodland Alliance and the *Larrea tridentata-Ambrosia dumosa* Shrubland Alliance described by Sawyer, Keeler-Wolf, and Evans (2009). Habitats are shown on Figure 1. The shrub layer at the Project site is dominated by Creosote bush (*Larrea tridentata*) with burweed (*Ambrosia dumosa*), winterfat (*Krascheninnikovia lanata*), spiny hopsage (*Grayia spinosa*), burro brush (*Hymenoclea salsola*), and scattered Joshua trees. The herbaceous layer includes a species-rich mix of native wildflowers including sand blossoms (*Linanthus parryae*), hairy-leaved comb-bur (*Pectocarya penicillata*), purple mat (*Nama demissum*), Pringle's woolly sunflower (*Eriophyllum pringlei*), Wallace eriophyllum (*Eriophyllum wallacei*), desert dandelion (*Malacothrix glabrata*), and coreopsis (*Coreopsis bigelovii*); non-native species common in the herbaceous layer throughout the Mojave Desert, including storksbill (*Erodium spp.*), foxtail brome (*Bromus madritensis*), and Mediterranean grass (*Schismus barbatus*), are also present. *Muilla maritima* and *Calochortus kennedyi* var. *kennedyi* were scattered around the site; neither species has special status but are infrequently observed in the Mojave Desert and should be noted. A total of 29 Joshua Trees, of various ages and sizes ranging from large, multi-branched individuals to juvenile trees less than two feet high, were counted within the Project footprint. Observed and mapped Joshua trees are depicted on Figure 1. A total of 58 vascular plant species belonging to 22 plant families were observed on-site (Appendix A). Fifty-three species were native, and the remaining five were non-native.

Joshua Tree Woodland

Joshua trees are an emergent small tree dispersed throughout a shrub canopy. The tree, shrub, and herbaceous layer can be open to intermittent with perennial shrubs and annual forbs and grasses. The dominant species display diverse life forms including sclerophyllus and microphyllus evergreen trees and shrubs, succulents, and ephemeral herbs requiring sufficient rainfall for germination. Joshua Tree Woodland is typically found on sandy, well-drained alluvial soils from 750–1,800 meters in elevation (Holland 1986).

Mojave Creosote Bush Scrub

Mojave Creosote Bush Scrub is an open shrubland dominated by widely spaced creosote bush and burro brush. Plant growth is limited by cold winter temperatures and drought. Many species of ephemeral herbs may flower in the spring with sufficient rainfall. It is widely distributed throughout the Mojave and Sonoran Deserts in southern California. Soils are well drained, with low water-holding capacity. Mojave creosote scrub intergrades with Joshua tree woodland at the Project site but generally was found along the perimeter of the site and in disturbed areas.

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FIGURE 1. HABITAT AND JOSHUA TREE LOCATIONS.

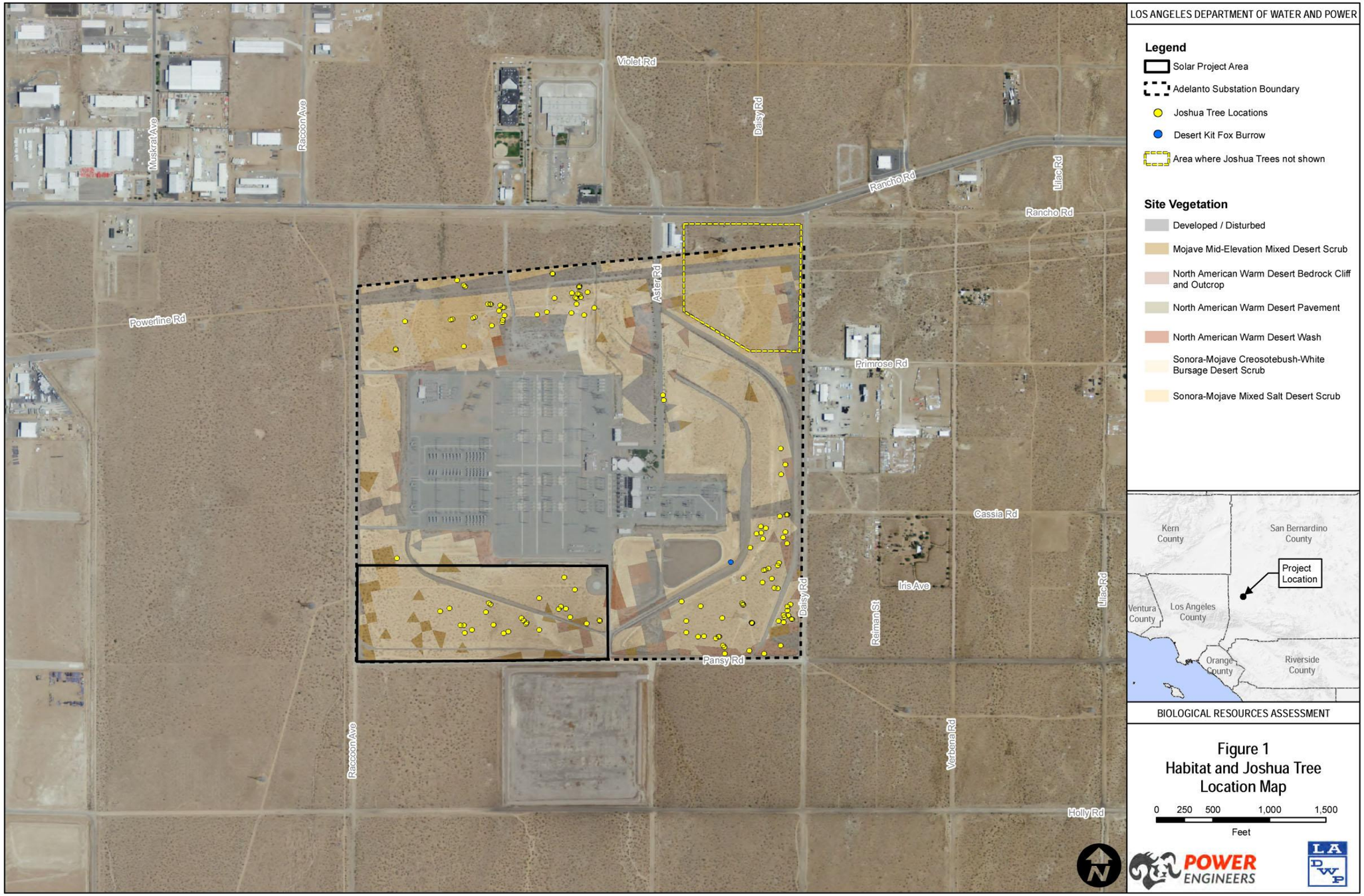

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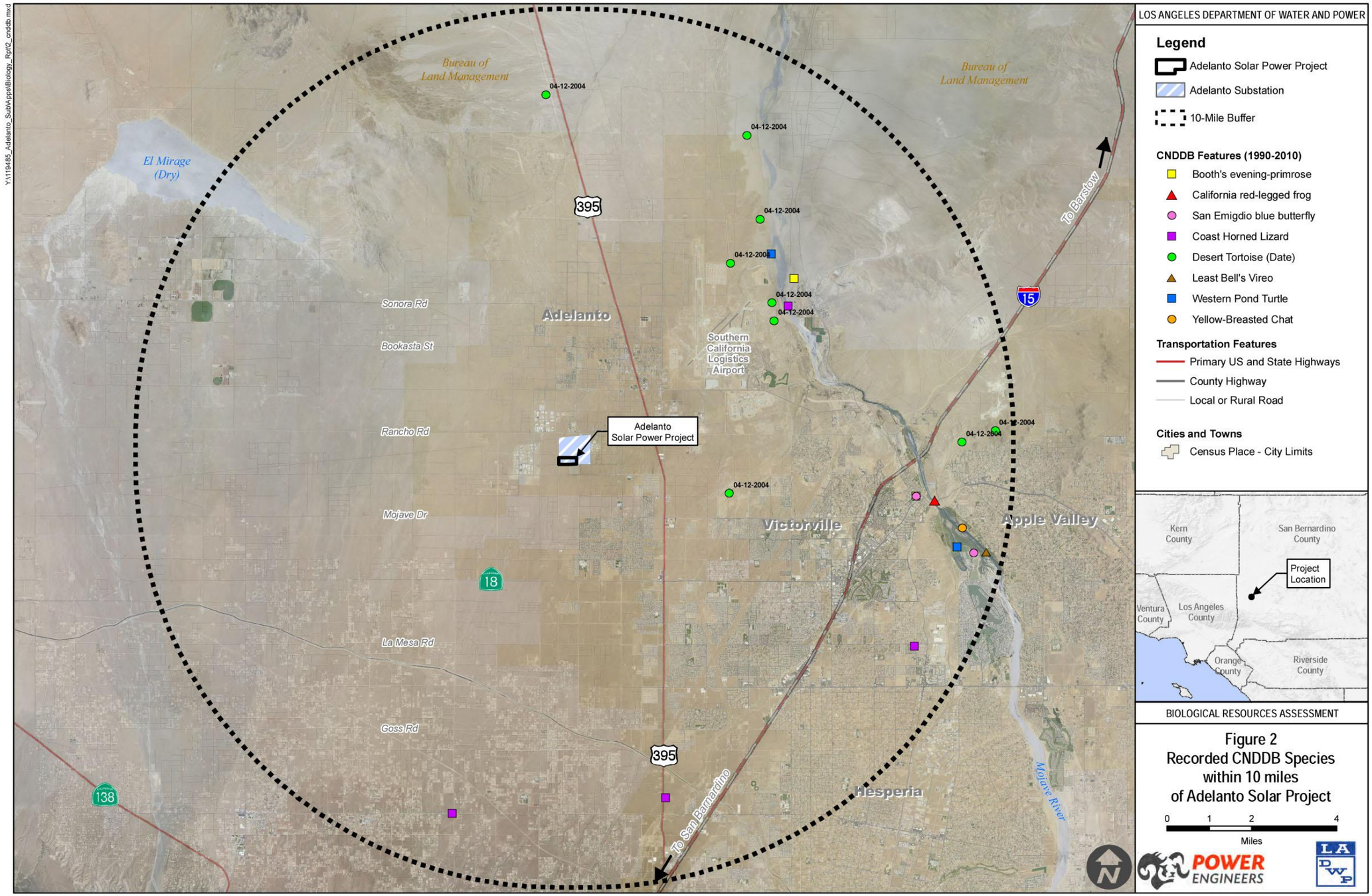
FIGURE 2. RECORDED CNDDB SPECIES WITHIN 10 MILES OF THE PROJECT



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3.2.2. Previous Disturbance

The northeast edge of the Project area closest to the switching station was used as a storage area for old material. A raised berm bisecting the site contained very little vegetation and was dominated by weeds. Dirt access roads ran along the perimeter of the Project area. Vegetation in the southeast portion of the site had lower vigor and diversity then the western portion of the site, and the soil had a peculiar dark mulch layer. Overall, vegetation in much of the site is good quality Creosote Scrub with a diverse native plant component. The site conditions, while disturbed, have limited access due to the facility fencing and though evidence of facility operations and activity beyond the switching yard and transmission line footprint is prevalent.

3.3 COMMON WILDLIFE

Due to the native and disturbed aspects of the Project area, common native wildlife is present but in possibly lower densities than may occur in other locations of the desert during seasonal and periodic rainfall. Wildlife species typical of the area and common include whiptail lizard (*Cnemidophorus tigris)*, rock dove (*Columba livia)*, red-tailed hawk (*Buteo jamaicensis)*, California quail (*Lophortyx californicus*), pocket gopher (*Thomomys bottae*), California ground squirrel (*Spermophilus beecheyi*), cottontail (*Sylvilagus audubonii*), and coyote (*Canis latrans*) (Bailey 1995).

Of note, one desert iguana (large adult) was observed on the north side of the parcel. This vegetarian lizard has not been commonly observed in the Project vicinity in recent years (personnel observation from other surveys). The site supports black-tailed jackrabbit, a California sensitive species. These species may have some predation advantage because of the perimeter fencing and limited access point for predators such as coyote.

One potential desert kit fox (*Vulpes macrotis*) burrow is located to the east of the proposed Project footprint and shown on Figure 1. The burrow included a fresh apron and new debris in the entry that indicated recent activity.

3.4 SPECIAL-STATUS SPECIES

Federal and State special-status plant and wildlife species lists were compiled for Project areas using the following sources: the California Natural Diversity Database (CNDDB) (CDFG, 2010); California Native Plant Society's (CNPS) Electronic Inventory (CNPS, 2010); and the USFWS Species List (USFWS, 2010.)

Known locations (that were recorded as occurring within the past 20 years) of special-status species identified in a ten-mile radius of the Project area are provided in Figure 2. Comprehensive special-status species lists are presented in this section (Tables 1 and 2). The lists include species listed as threatened or endangered under the federal ESA and CESA, and other special-status species tracked by the CDFG. Any special-status species whose habitat(s) or known distributions are within the Project area were evaluated for potential impacts resulting from construction, operation, and maintenance of the proposed Project. Other special-status species that were included on the USFWS, CDFG, and CNPS lists whose habitats or known distribution do not occur within the Project area were also included in tables, but not considered during impact assessment.

3.4.1. Special-status Plants

Based on a review of the CNDDB (2010) and CNPS Inventory of Rare and Endangered Plants (2010), five special-status species have potential to occur at the Project site. Small-flowered androstephium (*Androstephium breviflorum*), Booth's evening-primrose (*Camissonia boothii* ssp. boothii), sagebrush loeflingia (*Loeflingia squarrosa* var. *artemisiarum*), Mojave monkeyflower (*Mimulus mohavensis*), and

Short-joint beavertail (*Opuntia basilaris* var. *brachyclada*). Based on species habitat requirements, locations of recorded occurrences in proximity to the Project limits, site conditions, and results of field survey, it is determined that no State or Federal listed species has potential to occur on-site.

Botanical surveys were conducted in mid-April within the appropriate blooming period for each of the five special-status plant species with potential to occur on-site. Conditions were favorable for observing annual blooming and germination of perennial and annual species. The probability of occurrence for each species is presented in Table 1.

TABLE 1. SPECIAL-STATUS PLANT SPECIES CONSIDERED FOR OCCURRENCE IN THE ADELANTO SOLAR PROJECT AREA.

Common and Scientific names	Status			Habitat preferences	Flowering period	Potential for occurrence
	State[1]	Fed[2]	CNPS[3]			
Small-flowered androstephium *Androstephium breviflorum*	--	--	2.2	Mojavean Desert Scrub and Desert Dunes from 220-640 meters.	Mar-Apr	**Moderate.** Small flowered androstephium was not observed in the current survey conducted within the appropriate blooming period. Known locations in the Project vicinity within the town of Adelanto.
Booth's evening-primrose *Camissonia boothii* ssp. *boothii*	--	--	2.3	Joshua Tree Woodland and Pinyon/Juniper Woodland from 900-2,400 m.	Apr-Sep	**Low.** Site contained Mojavean Desert Scrub with scattered Joshua trees and did not qualify as Joshua Tree Woodland. The subspecies was not observed in the current survey conducted in mid April.
sagebrush loeflingia *Loeflingia squarrosa* var. *artemisiarum*	--	--	2.2	Desert Dunes, Great Basin Scrub and Sonoran Desert Scrub in sandy soils from 700-1,615 m.	Apr-May	**Absent.** Suitable habitat does not occur.
Mojave monkeyflower *Mimulus mohavensis*	--	--	1B.2	Sandy, gravelly soils in Joshua Tree Woodland and Mojavean Desert Scrub—often in washes—from 600-1,200 m.	Apr-Jun	**Moderate.** Mojave monkeyflower was not observed in the current focused surveys conducted at the beginning of the blooming period. Suitable habitat and soils occurred onsite.
Short-joint beavertail *Opuntia basilaris* var. *brachyclada*	--	FSS	1B.2	Chaparral, Joshua tree Woodland, Mojavean desert scrub, Pinyon and juniper woodland, from 425-1,800 m.	Apr-Jun	**Absent.** The variety was not observed in surveys conducted within the flowering period. The plant is a conspicuous perennial succulent and is identifiable in vegetative condition.

[1]State status
SE = listed as Endangered under the California Endangered Species Act
ST = listed as Threatened under the California Endangered Species Act
SR = listed as Rare under the California Native Plant Protection Act

[2]Federal status
FE = listed as Endangered under the federal Endangered Species Act
FT = listed as Threatened under the federal Endangered Species Act
FC = candidate for listing
FSS = Forest Service Sensitive
FSW = Forest Service Watch list

[3]CNPS designations
List 1B Plants rare, threatened, or endangered in California and elsewhere
Plants rare, threatened, or endangered in California, but more common elsewhere
List 3 Plants for which more information is needed; a review list
List 4 Plants of limited distribution; a watch list

CNPS threat extension codes
.1 Seriously endangered in California
.2 Fairly endangered in California
.3 Not very endangered in California

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3.4.2. Special-status Wildlife

Information acquired from the CNDDB (species listed as endangered, threatened, or California Species of Special Concern), USFWS county list, and other sources resulted in the identification of special-status wildlife species that could occur within the Project quadrangle. Special-status wildlife species information is detailed in Table 2.

TABLE 2. SPECIAL-STATUS WILDLIFE SPECIES INVESTIGATED FOR POTENTIAL OCCURRENCE IN PROJECT AREA

SPECIES GROUP AND NAME	LEGAL STATUS FEDERAL/STATE	SEASONALITY	OCCURRENCE POTENTIAL IN PROPOSED PROJECT AREA
Reptiles			
Gopherus agassizi desert tortoise	T/T	Resident	Low. The Project site support mixed creosote scrub habitat and is within the recent historic range of this species. Recent urbanization and the ongoing fragmentation of native habitat has decreased the numbers of tortoises within the Project vicinity in the past 20 years. The species may occur but is not likely because of fragmentation, number and use of paved roads, urbanization and minimal of observed tortoises within 10 miles during past 20 years despite ongoing survey requirements for recent housing and other projects .
Birds			
Athene cunicularia burrowing owl	--/SC	Resident	Moderate. Potential to occur in project areas; prefers open country with low vegetation, good visibility and loose soil for burrows; may occur in disturbed areas anywhere within the project area. None were observed during assessment survey. No burrows or potential burrow observed within the Project footprint. Suitable potential burrows are present in the project area.
Laconte's thrasher	--/SC	Resident	Moderate. Area is disturbed by urbanization and existing switching station. This species may occur but is less likely due to fragmentation of habitat, urban disturbances, and existing site conditions.
Mammals			
Taxidea taxus American badger	--/SC	Resident	Absent. Suitable habitat is no longer present due to urbanization and fragmentation of native habitat.
Mohave ground squirrel	--/T	Resident	Low. Suitable habitat is present within and adjacent to the project limits. No records for the species have been recorded in recent years within 10 miles of the project limits. Antelope ground squirrel is present on site and is identified to outcompete MGS.

E= listed endangered by federal or California ESA, T= listed threatened by federal or California ESA
C= listed endangered by federal ESA, SC = California Dept. of Fish and Game Species of Concern

4.0 ASSESSMENT METHODS

4.1 SIGNIFICANCE CRITERIA

The significance of potential Project-related impacts to biological resources is based on the following considerations and impact thresholds. An impact that results in long-term loss or degradation of sensitive habitat, or that adversely affects the population of a special-status species, will generally be considered significant. Sensitive habitats and special-status species are those that are demonstrably rare, threatened, or endangered; are protected by statute or regulation; or have recognized commercial, recreational, or scientific importance. Project-related impacts to biological resources may be considered less than significant if there is little or no importance to a given habitat or if disturbance would not create a significant impact to habitats or species. A project would have a significant impact on biological resources if it would:

a. Have a substantial adverse impact, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFG or USFWS.

b. Have a substantial adverse impact on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations, or by the CDFG or USFWS.

c. Have a substantial adverse impact on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to: marsh, vernal pool, coastal) either individually or in combination with the known or probable impacts of other activities through direct removal, filling, hydrological interruption, or other means.

d. Interfere substantially with the movement of any resident or migratory fish or wildlife species or with established resident or migratory wildlife corridors, or impede the use of wildlife nursery sites.

e. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.

f. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Communities Conservation Plan, or other approved local, regional, or state habitat conservation plan.

5.0 ASSESSMENT RESULTS

Based upon observations made during site assessment surveys, Project-related ground disturbing activities (both temporary and permanent) would occur in areas that support native vegetation but have been partially fragmented by the existing chain link fence, paved and dirt roads, and existing facility operation. Direct and indirect impacts are analyzed in Section 6.

The Project does not require Federal funding or have other Federal nexus. Consultation with USFWS regarding potential impacts to desert tortoise and consultation with CDFG regarding potential impacts to desert tortoise and Mohave ground squirrel will be conducted by LADWP to determine the necessity of specific wildlife permits.

6.0 PROJECT IMPACT ANALYSIS

Direct impacts occur when biological resources are altered or destroyed during the course of, or because of, Project implementation. Examples of such impacts include removal or grading of vegetation, filling wetland habitats, or severing or physically restricting the width of wildlife linkages. Other direct impacts may include loss of foraging or nesting habitat and loss of individual organisms because of habitat clearing.

Indirect impacts may include elevated levels of noise or lighting, changes in surface water hydrology within a watershed, and increased erosion or sedimentation. Indirect impacts can affect vegetation communities or their potential use by sensitive animals. These impacts may affect the breeding and foraging behavior of animals both on and off the Project site. Permanent impacts may result in irreversible damage to biological resources. Temporary impacts are interim changes in the local environment due to disturbance that would not extend beyond Project-associated construction.

6.1 DIRECT IMPACTS

6.1.1. Sensitive Plant Species

The Project area has the potential to support sensitive plant species but, based on the survey results and site conditions, the species with a potential to occur in the region are not expected to be within the Project footprint. Therefore, no direct impact to sensitive or protected plant species is expected to occur as a result of the proposed Project.

Approximately 29 Joshua trees of various sizes are within the Project footprint (see Figure 1). Although removal of Joshua trees sometimes requires a permit from local and State agencies, the removal by a municipal government or public utility when acting in the performance of its obligations to provide service to the public would not be subject to the ordinances. Removal of the Joshua trees, nonetheless, would be a significance impact that could be mitigated by relocating suitable trees. The Project, however, will evaluate Joshua trees within the construction footprint for feasibility of relocating them to another location on the Project site and relocate suitable trees (BIO-1).

6.1.2. Sensitive Wildlife Species

Direct impacts to wildlife would include loss of habitat or individuals as well as impacts on the ability of wildlife to obtain resources or complete normal life history stages, such as breeding. Most potential direct impacts to wildlife can be minimized or reduced to insignificance through the use of institutional controls, best management practices, temporal and spatial avoidance measures, monitoring, adaptive construction management, and adherence to existing plans and guidelines. The potential for direct impacts exists for the following sensitive wildlife species.

Desert Tortoise

The Project is within the recent historic range of the desert tortoise and supports suitable habitat for this species. No desert tortoises or sign of desert tortoise was found during the protocol survey. The region has undergone recent and rapid urbanization and patchwork conversion of native habitat to heavy industrial, light industrial, warehouse, commercial, and residential use. This has significantly fragmented and degraded the quality of the remaining native habitat in the vicinity of the Project limits. The adjacent areas are disturbed by vehicle use, domestic dog packs, and illegal dumping. Therefore, the Project has only a low historic potential to support desert tortoise.

The potential for direct impacts would be reduced to a less than significant level by best construction practices and pre-construction survey to avoid incidental take of desert tortoise (BIO-3). The proposed

Project is not expected to result in the extinction of this species or directly contribute to or hasten its demise. Potential to affect will be reviewed and determined in coordination with USFWS and CDFG.

Mohave Ground Squirrel

Mohave ground squirrel, a State threatened species, has a potential to occur based on historic range. This potential to occur is reduced based on the extent of existing and adjacent disturbance and lack of recorded sightings in the Project vicinity during the past 20 years, even with ongoing recent surveys for other projects. If the species is present, then direct impact may result during construction and operation of the Project. These potential effects are expected to be reduced to a less than significant level by implementing best construction practices during Project construction (BIO-4). Based on available information, it is not expected that this species occurs within or adjacent to the Project. The loss of habitat on site would not significantly contribute to the extinction of this species, or directly or indirectly hasten its demise.

Burrowing owl

Burrowing owl, a State species of concern, has potential to occur within the Project area. No potential burrow or owl was observed during the site assessment surveys. This species forages over open areas and typically nests in abandoned squirrel or other rodent burrows but may nest in rock piles and other suitable locations, such as pipes. Direct impact may result from active nest abandonment during construction of the Project components. Indirect impact to this species could include permanent and temporary loss of foraging habitat, noise disturbance during nesting and foraging, increased predation attempt failure rate as a result of construction activity disturbance, and other temporary behavior adjustments associated with potential temporary construction impacts. These potential effects are expected to be reduced to a less than significant level by implementing best construction practices and preconstruction survey to reduce potential impacts during Project construction (BIO-2). The proposed Project is not expected to result in the extinction of this species or directly contribute to or hasten its demise, or result in an increased likelihood of the species being listed as a State or Federal protected species in other than its current status.

6.1.3. Critical Habitat

The Project will not affect any designated critical habitat as identified by USFWS. The Project is not within a Desert Wildlife Management Area or adjacent to lands covered by the West Mojave Plan (U.S. Department of the Interior, Bureau of Land Management).

6.1.4. Waters of The United States

Two small ephemeral drainages occur on the southwestern corner of the site and are continuous offsite to the south by road culverts. The drainages do not support wetland or riparian vegetation. Species such as desert willow or smoke tree are absent. No change in density of predominant vegetation occurs within the drainage areas. In addition, the drainages are not well developed and do not have specific features such as high water marks, defined "banks," or wetlands. Changes in these drainages due to construction of the solar panels would not have a substantial impact on riparian habitat. Based on these factors, the two small drainages do not represent jurisdictional features subject to permitting under Section 404 of the Clean Water Act or Section 1602 of the California Fish and Game Code. Therefore, minor alterations to these drainages would have no impact. These drainages are part of the overall site drainage control that includes gabion diversion barriers, detention basins, and excavated ditches and channels to divert surface flows from south to north around the existing switching yard facility.

6.2 INDIRECT IMPACTS

Indirect impacts have the potential to occur to sensitive or protected species as a result of the proposed Project. Proposed mitigation is expected to reduce these potential impacts to less than significant.

6.2.1. Sensitive Plant and Wildlife Species

No significant impact to local air quality or deposition of pollutants on nearby vegetation or aquatic environments would occur. No impact to sensitive plants that may occupy adjacent habitats would occur.

Indirect impacts to sensitive or protected wildlife species could include permanent and temporary loss of foraging habitat, noise disturbance during mating and foraging, and other temporary behavior adjustments associated with potential temporary construction impacts.

Indirect impacts to adjacent habitats from temporary construction-related noise and human presence may affect sensitive wildlife. Timing and best management practices would minimize these effects.

6.2.2. Critical Habitat

The proposed Project is not expected to indirectly affect any critical habitat as defined by USFWS.

6.3 CUMULATIVE IMPACT

The Project has the potential to contribute to the cumulative loss of native creosote scrub habitat as a result of ongoing urbanization and land conversion in the Adelanto area. The recent building boom has resulted in the conversion of hundreds of acres of native habitat to commercial and residential use, with associated increase in traffic and population. The contributive effect is specific to the loss of potential forage and breeding habitat for desert tortoise and Mohave ground squirrel. These species have the potential to migrate through the desert and occupy different regions over time. The vegetation is also long lived and once removed does not typically re-establish to the same level of diversity as undisturbed desert habitat.

Though the Project has the potential to contribute to the cumulative loss of native creosote scrub habitat, the impact is not cumulatively considerable in this case because the site is already committed to use as an electrical switching and converter station and is fully enclosed with chain link fence. Notwithstanding the ongoing urbanization in Adelanto that has resulted in the conversion of hundreds of acres of native habitat to commercial and residential use with associated increase in traffic and population, the Project site with its existing uses and limitations is not well suited to habitat preservation. No sensitive wildlife species was observed using the site. For these reasons, the proposed Project would not have cumulatively considerable or significant cumulative impacts relative to biological resources.

7.0 PROPOSED CONDITIONS OF EXEMPTION

The construction and operation of the Project is not expected to result in significant biological impacts. The following avoidance and minimization measures will be incorporated to minimize impacts due to temporary construction activities.

BIO-1

Joshua trees suitable for removal will be relocated within the existing Adelanto Switching Station parcel by a qualified landscape contractor with previous successful (greater than 50% survivorship after 2 years) transplant experience.

BIO-2

A preconstruction survey for nesting birds within the Project area will be conducted prior to ground disturbance and construction activities that occur between March 15 and August 31. The survey will be conducted no more than two weeks prior to mobilization or construction activities and should be

conducted by a qualified biologist familiar with Western burrowing owl, raptors, and other avian species of the region. If nesting bird species are detected, then mitigation will be incorporated to establish a work restriction limit around the active nest until chicks are fledged or the nest naturally fails.

BIO-3

Comply with and implement best practice measures consistent with USFWS and CDFG determination and guidance, to protect low probability of occurrence of encountering desert tortoise during project construction. Conduct a pre-construction clearance survey prior to mobilization or construction that would result in vegetation or soil disturbance to confirm absence of desert tortoise within the facility parcel (the fenced parcel limits supporting native vegetation or open habitat).

BIO-4

Provide construction personnel with a Worker Environmental Awareness Program (WEAP) to inform them of Best Management Practices for limiting impact to wildlife and native vegetation inside and outside the construction limits.

8.0 HABITAT CONSERVATION PLANS

The Project is not covered by a Habitat Conservation Plan.

9.0 REGULATORY AUTHORIZATIONS AND SCHEDULE

Table 3 lists the required permits and schedule.

TABLE 3. PERMIT SCHEDULE

AUTHORIZATION	AGENCY CONTACT	SCHEDULE
FESA	U.S. Fish and Wildlife Service –	No Federal nexus. Undefined time limit. Consultation with USFWS
CESA	California Department of Fish and Game	Potential to affect State listed species not covered by USFWS Consultation with CDFG

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11.0 REPORT PREPARERS

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APPENDIX A—OBSERVED PLANT SPECIES LIST

Plant Species Observed at the Adelanto Solar Project Site April 15, 2010

Scientific Name	Common Name
Dicots	
Amaranthaceae	**Amaranth family**
Atriplex confertifolia	Shadscale saltbush
Chenopodium californicum	Pigweed
Grayia spinosa	Spiny hopsage
Krascheninnikovia lanata	Winterfat
Apiaceae	**Carrot family**
Lomatium mohavense	Mojave desert parsley
Asteraceae	**Aster family**
Ambrosia psylostachia	Ragweed
Ambrosia dumosa	Burrobush
Chrysothamnus nauseosus	Rubber rabbitbrush
Coreopsis bigelovii	Bigelow's tickseed
Ericameria linearifolia	Narrowleaf goldenbush
Eriophyllum pringlei	Pringle's woolly sunflower
Eriophyllum wallacei	Wallace eriophyllum
Filago californica	California cottonrose
Hymenoclea salsola	Burro brush
Lasthenia californica	California goldfields
Layia glandulosa	Tidytips
Malacothrix glabrata	Desert dandelion
Stephanomeria pauciflora	Wirelettuce
Boraginaceae	**Borage family**
Amsinckia menziesii	Fiddleneck
Cryptantha sp.	Cryptantha
Nama demissum	Purplemat
Pectocarya penicillata	Hairy-leaved comb-bur
Pectocarya setosa	Moth combseed
Brassicaceae	**Mustard family**
*Descurainia pinnata**	Western tansymustard
Lepidium fremontii	Desert pepperweed
Cactaceae	**Cactus family**
Opuntia basilaris var. *basilaris*	Beavertail pricklypear
Opuntia echinocarpa	Silver cholla
Caryophyllaceae	**Pink family**
Herniaria hirsuta ssp. *cinerea*	Hairy rupturewort
Silene laciniata	Cardinal catchfly
Crassulaceae	**Stonecrop family**
Crassula connata	Sand pygmy

Scientific Name	Common Name
Euphorbiaceae	**Spurge family**
Chamaesyce albomarginata	Sandmat
Fabaceae	**Pea family**
Astragalus lentiginosus	Freckled milkvetch
Lupinus concinnus	Bajada lupine
Geraniaceae	**Geranium family**
*Erodium cicutarium**	Redstem stork's bill
Lamiaceae	**Mint family**
Salazaria mexicana	Mexican bladdersage
Salvia columbariae	Chia
Salvia carduacea	Thistle sage
Loasaceae	**Loasa family**
Mentzelia albicaulis	Small-flowered blazingstar
Onagraceae	**Evening Primrose family**
Camissonia campestris	Suncup
Camissonia claviformis	Browneyes
Camissonia pallida ssp. pallida	Paleyellow suncup
Polemoniaceae	**Phlox family**
Gilia latiflora	Broad-flowered gilia
Linanthus dichotomus	Evening snow
Linanthus parryae	Sandblossoms
Polygonaceae	**Buckwheat family**
Eriogonum sp.	Annual buckwheat
Eriogonum sp.	Annual buckwheat
Eriogonum fasciculatum var. *polifolium*	California buckwheat
Portulacaceae	**Purslane family**
Calyptridium monandrum	Pussy paws
Solanaceae	**Nightshade family**
Lycium cooperi	Peach thorn
Zygophyllaceae	**Creosote-bush family**
Larrea tridentata	Creosote bush
Monocots	
Agavaceae	**Century-plant family**
Yucca brevifolia	Joshua tree
Liliaceae	**Lily family**
Calochortus kennedyi var. *kennedyi*	Desert mariposa lily
Dichelostemma capitatum	Bluedicks
Muilla maritima	
Poaceae	**Grass family**
Achnatherum hymenoides	Indian rice grass
*Bromus madritensis**	Foxtail brome

Scientific Name	Common Name
*Bromus tectorum**	Cheatgrass
*Schismus barbatu*s*	Mediterranean grass

*Non-native species

APPENDIX 4
CULTURAL RESOURCE SURVEY REPORT

May, 2010

LOS ANGELES DEPARTMENT OF WATER & POWER
Adelanto Solar Power Project

Cultural Resource Survey Report

LEGAL DESCRIPTION: *T6N R5W; T5N R6W; T6N R5W; and T5N R5W.*
ACREAGE: *42.5 Acres*
USGS QUADRANGLES: *Adelanto*
KEY WORDS: *Inventory, Historic Sites, Archaeological Sites, Adelanto, San Bernardino County, LADWP*

PROJECT NUMBER:
119485

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POWER ENGINEERS

ADELANTO SOLAR POWER PROJECT
CULTURAL RESOURCE SURVEY REPORT
SAN BERNARDINO COUNTY, CALIFORNIA

PREPARED FOR: LOS ANGELES DEPARTMENT OF WATER AND POWER
111 NORTH HOPE STREET
LOS ANGELES, CA 90012

PREPARED BY: POWER ENGINEERS, INC.
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REVISION HISTORY		
DATE	**REVISED BY**	**REVISION**

EXECUTIVE SUMMARY

The Los Angeles Department of Water and Power (LADWP) requested that POWER Engineers, Inc. (POWER) conduct a cultural resources inventory of 42.5 acres of land within the boundaries of the existing Adelanto Electrical Substation in San Bernardino County, California. The project area is located within Township 6N, Range 5W Section 36; Township 5N, Range 6W Sections 1 and 12; Township 6N, Range 5W Sections 31 and 32; and Township 5N, Range 5W Sections 5, 6, 7, and 8. The project area is on the USGS Adelanto 7.5-minute quadrangle.

The purpose of this study is to identify cultural resources which could potentially be impacted by the use of the LADWP portion of the substation for the development of solar panels and related infrastructure.

On March 10, 2010, POWER conducted a records search at the San Bernardino Archaeological Information Center (SBAIC) for a one-mile radius around the exterior boundary of the Adelanto Solar Power Project area. An intensive, systematic, pedestrian cultural resources inventory of the 42.5-acre project area was completed by POWER on March 10 and 11, 2010. Ground visibility was 80 percent or better in all areas.

One historic-period archaeological site (a can scatter), one likely historic archaeological site (a rock circle), and two isolated finds, both of them cans, were documented during the cultural resources inventory. None of these are recommended as eligible for listing in the California Register of Historical Resources (California Register), and none of them qualify as unique archaeological resources or historical resources under the California Environmental Quality Act (CEQA).

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1.0 INTRODUCTION

On February 22, 2010, the Los Angeles Department of Water and Power (LADWP) contracted POWER Engineers, Inc. (POWER) to conduct a cultural resources inventory of the Adelanto Substation, located in San Bernardino County, California (Figure 1). LADWP proposes to install photovoltaic (PV) solar panels on 42.5 acres within the existing boundaries of the Adelanto Electrical Substation. The solar panels will be used to collect, transmit, boost, and distribute solar energy throughout the existing transmission system that currently connects to the substation.

The Adelanto Substation is located northwest of Victorville in San Bernardino County. The project area is within Township 6N, Range 5W Section 36; Township 5N, Range 6W Sections 1 and 12; Township 6N, Range 5W Sections 31 and 32; and Township 5N, Range 5W Sections 5, 6, 7, and 8. The project area is on the USGS Adelanto 7.5-minute quadrangle.

There are 200 acres of undeveloped land within the existing boundary fence of the Adelanto Substation, excluding the footprints of buildings, structures, or other materials related to the substation. The actual area of the cultural resources survey included all land that would potentially receive direct impacts through ground disturbance associated with the proposed project. The total survey area was 42.5 acres. The survey area is illustrated in Figure 2.

FIGURE 1. PROJECT VICINITY

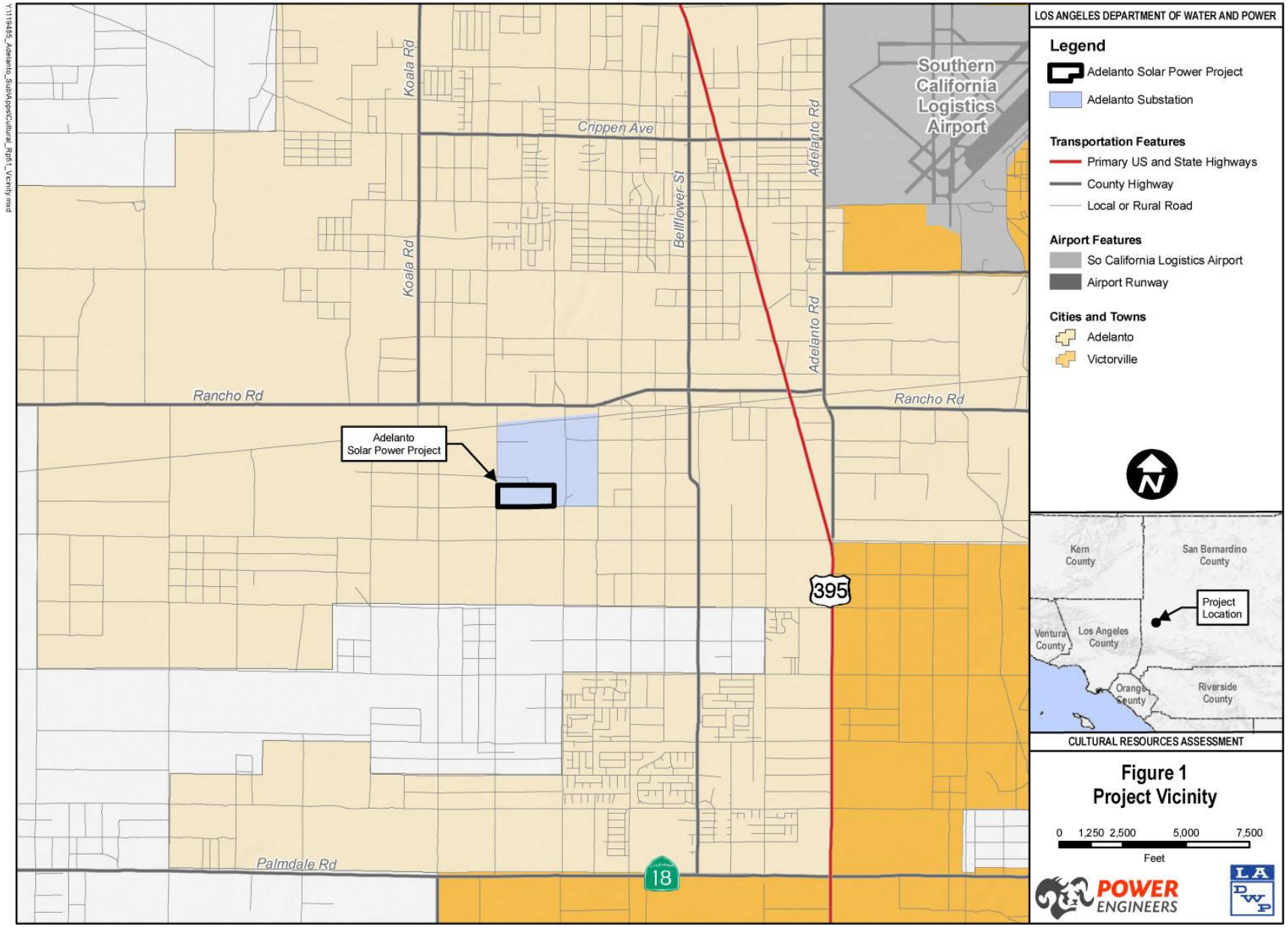
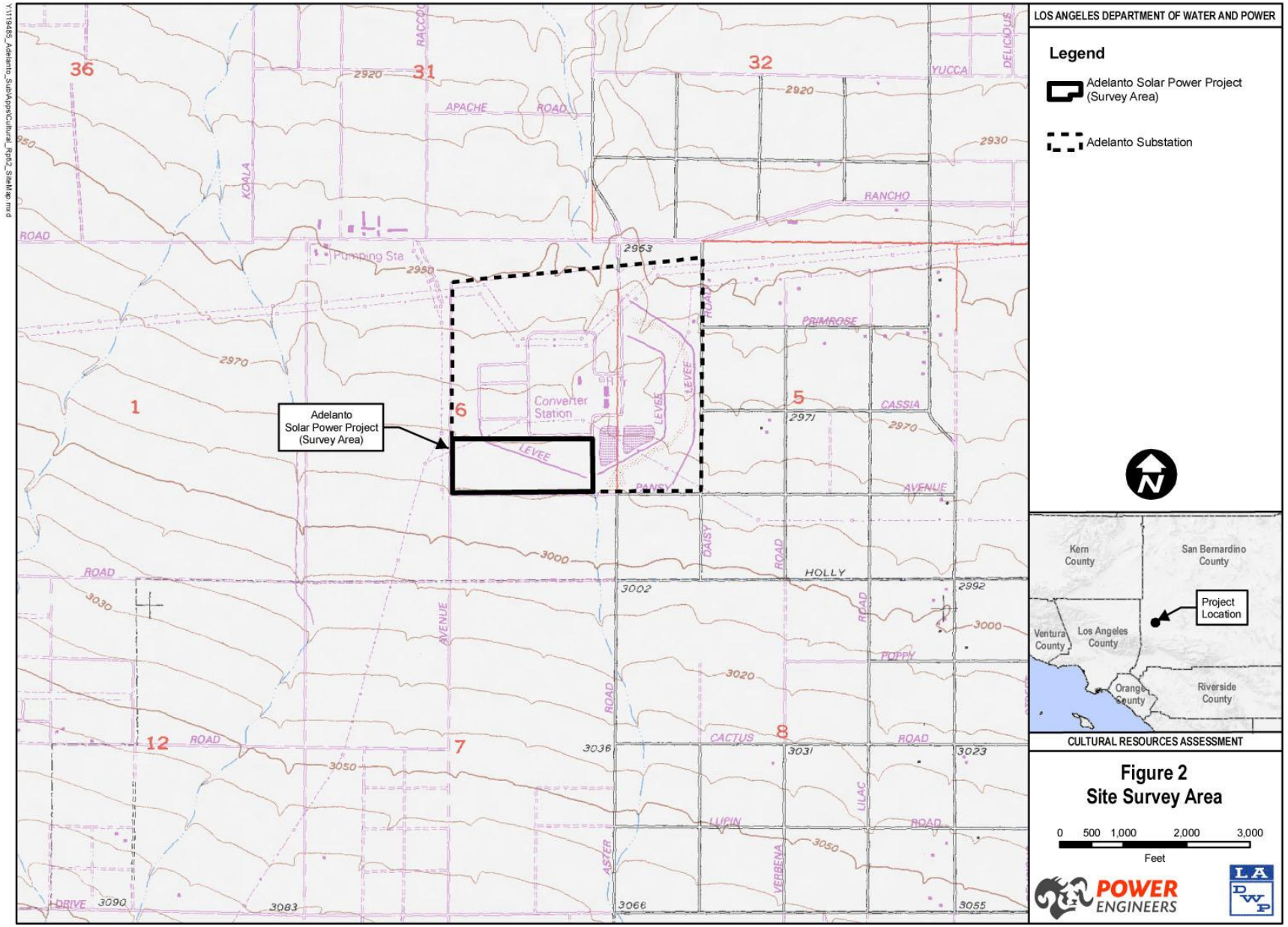


FIGURE 2. PROJECT SITE AND SURVEY AREA



2.0 ENVIRONMENTAL SETTING

The Adelanto Substation is located within the semi-arid region of the western Mojave Desert. The project area is on a broad alluvial plain with a gently rising slope to the south and southwest. Elevation within the project area is approximately 2,900 feet above sea level. The Mojave River runs generally north-south approximately five miles east of the project area.

Vegetation within the project vicinity is dominated by Creosote Bush Scrub Plant and Joshua Tree Woodland communities. The shrub layer is dominated by creosote bush (*Larrea tridentata*) with burweed (*Ambrosia dumosa*), winterfat (*Krascheninnikovia lanata*), spiny hopsage (*Grayia spinosa*), burro brush (*Hymenoclea salsola*) and scattered Joshua trees. The herbaceous layer is composed of a diverse mix of native wildflowers including sand blossoms (*Linanthus parryae*), combseed (*Pectocarya*), purple mat (*Nama demissum*), Pringle's woolly sunflower (*Eriophyllum pringlei*), Wallace eriophyllum (*Eriophyllum wallacei*), desert dandelion (*Malacothrix glabrata*), and coreopsis (*Coreopsis*), and non-native species common in the herbaceous layer throughout the Mojave Desert including storksbill (*Erodium spp.*), foxtail brome (*Bromus madritensis*) and Mediterranean grass (*Shizmus barbatus*) (POWER 2010).

Mammals reported in the general vicinity of the Adelanto Substation include mule deer (*Odocoileus hermionus*), jackrabbit (*Lepus californicus*), cottontail rabbit (*Sylvilagus audubonii*), coyote (*Canis latrans*), spotted skunk (*Spilogale putorius*), kit fox (*Vulpes macrotis*), bobcat (*Lynx rufus*), and several genera of bats (*Chiroptera*). (Parr et al. 1990).

2.1 CULTURAL SETTING

2.1.1. Prehistoric Context

The prehistory of the western Mojave Desert can be described using a chronological scheme proposed by Warren (1980, 1984) and Warren and Crabtree (1986), which divides the prehistoric era into five temporal periods following the Paleo-Indian Period: Lake Mojave, Pinto, Gypsum, Rose Springs, and Late Prehistoric. The following summary is brief and not intended to provide a complete prehistory and history of the study area, but to simply provide the reader a general context for the cultural resources in the project vicinity.

Paleo-Indian Period (13,000 to 10,000 Before Present [BP])

The Paleo-Indian period is represented in the western Mojave Desert by isolated Clovis-like fluted points generally found on the surface. These resources represent a Big Game Hunting Tradition focused on the exploitation of abundant large game during the terminal Pleistocene and early Holocene. Though lacking ground stone artifacts, Paleo-Indian people exploited plant resources to supplement a game-focused economy (Bevill 2009).

Lake Mojave (10,000 to 6,000 BP)

The Lake Mojave period is an adaptation found in association with ancient lake shores. This period represents a more diversified and generalized economy (Sutton 1996). The trademark artifact of this period is the Lake Mojave projectile point (leaf shaped, long-stemmed, with narrow shoulders) and Silver Lake projectile point (short blade, stemmed point, with distinct shoulders). Due to their size these tools were likely used with a thrust or thrown spear. Hunting and utilization of lacustrine resources were the basis of subsistence (Parr et al. 1990). Lake Mojave occupations have been found more commonly in the eastern and central Mojave Desert, with rare occurrences from the western Mojave (Sutton 1996).

Pinto (6,000 to 4,000 BP)

The Pinto period follows the Lake Mojave period and is characterized by Pinto-style dart points (thick, shouldered, expanding stem with concave bases). Pinto period assemblages show an increase in the use of ground stone tools for grinding plants, while faunal remains are dominated by deer and rabbit (Warren and Crabtree 1986). These changes in subsistence suggest broad spectrum foraging in response to increasingly dry conditions. Sites associated with this period are usually found in open settings in relatively well-watered locations.

Gypsum (4,000 to 1,500 BP)

The Gypsum period is marked by increasing population and broadening economic activities as Native Americans developed technological adaptations to the desert environment. Hunting continued to be an important subsistence focus, but the processing of plant foods took on greater importance as evidenced by an increase in the frequency and diversity of ground stone artifacts (Bevill 2009). Considerable evidence of increased contact with the California coast and the Southwest is present. Gypsum period sites are characterized by medium- to large-stemmed and notched projectile points, including Elko series, Humboldt Concave Base, and Gypsum points. In addition, there are rectangular-based knives, flake scrapers, occasional large scraper planes, choppers, and hammerstones. Handstones and milling tools become relatively common, and the mortar and pestle appear for the first time. In addition to open sites, the use of rock shelters appears to have increased at this time. Base camps are a prominent site type in well-watered valleys and near concentrated resources (Warren and Crabtree 1986). Additionally, several types of special purpose sites in upland settings begin to appear during this period.

Rose Spring (1,500 to 1,000 BP)

The Rose Spring period follows the Gypsum period in the western Mojave and is distinguished by the Rose Spring projectile point series that represents the transition from the spear thrower of the Pinto and Gypsum periods to the bow and arrow (Parr et al. 1990). Rose Spring period sites are common in the Mojave Desert. Such sites often contain well-developed middens and abundant cultural materials, including milling equipment, hunting tools, and marine shell artifacts (Sutton 1996). Subsistence practices during the Rose Spring period appear to have shifted to the exploitation of medium and small game, including rabbits and rodents, with a decreased emphasis on large game. The processing of plant foods was an increasingly important activity, as suggested by milling slabs, handstones, pestles, mortars, and bedrock milling features.

Late Prehistoric (1,000 BP to Historic Contact)

The Late Prehistoric period is characterized by Desert series (Desert Side-notched and Cottonwood triangular) projectile points, brownware ceramics, Lower Colorado Buff Ware ceramics, unshaped handstones and millingstones, incised stones, mortars, pestles, and shell beads (Warren and Crabtree 1986). Assemblages sharing these material characteristics are thought to represent the cultural expansion of ancestral Shoshone throughout most of the Great Basin and adjacent areas (Bevill 2009).

2.1.2. Ethnography

After the Spanish began colonizing California in 1769, Native American groups were subject to dramatic social and cultural changes, including the establishment of the Spanish mission system and the introduction of new diseases that decimated native populations. Population declined even further during smallpox epidemics in 1863 and 1870. Some early historic Native American groups no longer exist. Understanding which 18th and 19th century Native American groups lived in or near which specific areas within the Mojave Desert is further complicated by the fact that these groups typically had fluid linguistic and sociopolitical boundaries or no boundaries at all. The Adelanto Solar Power Project area falls within traditional Serrano territory. However, the neighboring Tataviam also warrant a brief description.

Serrano

This hunting-gathering group lived primarily east of the Mojave River and north of San Bernardino. The Serrano were organized into local groups claiming relatively small territories. There was no larger political organization and there was no formal territory defined for the entire tribe.

The Serrano made annual rounds to the foothills of the San Bernardino Mountains to collect nuts, edible bulbs, roots, and seeds. The Serrano were known to have practiced a periodic burning of land where chia seeds grew naturally in order to increase the harvest in following years (Brandman 2006).

Settlement was determined primarily by proximity to permanent water sources. Villages and camp sites were found most often in the foothills and less frequently on the desert floor, depending on the availability of water.

Spanish influence on the Serrano was negligible until around 1819, but by 1834 most Serrano had been forced to relocate to missions and had lost much of their traditional culture. Today, most Serrano live on the Morongo and San Manuel Reservations.

Tataviam

The Tataviam lived just west of the project area. The territory of the Tataviam surrounded the upper reaches of the Santa Clara River drainage, and included the southwest portions of Antelope Valley. To the south, the territory extended into the San Gabriel Mountains and San Fernando Valley (King and Blackburn 1978).

Very little is known about the Tataviam because they virtually disappeared as a distinct sociopolitical group by 1900. By 1810, most Tataviam had been baptized at San Fernando Mission, and in 1916, the last speaker of the Tataviam language died.

Like their neighbors, the Tataviam probably followed an annual cycle of trapping, and hunting and harvesting animals and plants. Settlements ranged from large villages of 200 people to small communities of fewer than 10 people. Groups consisting of several related families or larger kin groups lived in permanent villages (King and Blackburn 1978).

2.1.3. Historic Context

In the Adelanto Solar Power Project area, the transition from the prehistoric period to the historic era occurred during the mid-1700s, when Spanish expeditions began arriving in California to establish missions to convert the native population to Catholicism. Although most early missions were established along the coast between San Diego and Sonoma, a few expeditions went inland. One of the first was led by Gaspar de Portola in 1769 into the upper reaches of the Santa Clara Valley. Following expeditions included those led by Pedro Fages in 1772 and by Fr. Garcés in 1776. Fages crossed what is now San Bernardino County on his way to the San Jacinto Valley.

From 1821 until the end of the Mexican-American war in 1848, southern California remained part of Mexico. In 1849, the Treaty of Guadalupe Hidalgo was signed between Mexico and the United States, and the region that would become the State of California came under the jurisdiction of the United States. California was admitted to the union in 1850.

Due to the harsh environment, development of the Mojave Desert was slow and population was sparse until the 1850s. Several trails crossed the desert and these routes were later followed by the Santa Fe

Railroad, Route 66, and Interstate 15. Fertile land along the Mojave River attracted agriculture, and in 1935, US Highway 395 was designated, providing access for recreational and commercial traffic.

Adelanto was founded in 1915 by E.H. Richardson, the inventor of what would become the Hotpoint Electric Iron. He planned to develop one of the first master planned communities in southern California.

3.0 INVENTORY METHODS

A review of records by POWER for the Adelanto Solar Power Project took place at the San Bernardino Archaeological Information Center (SBAIC) on March 10, 2010. The record search included examining maps to locate previously recorded cultural resources in the project area, as well as cultural resource survey reports and historical maps.

An intensive, systematic pedestrian cultural resources inventory of the 42.5-acre project area was completed by POWER on March 10 and 11, 2010. During the survey, two archaeologists spaced no farther than 15 meters (50 feet) apart walked parallel transects across the project area. Ground visibility was 80 percent or better in all areas.

Site datums, site boundaries, and the locations of isolated finds were mapped using a Trimble Geo XT Global Positioning System (GPS) unit and are provided in North American Datum (NAD) 83 CONUS datum and Universal Transverse Mercator (UTM) projection.

Sites and isolates were recorded on appropriate California Office of Historic Preservation (OHP) DPR 523 inventory forms. Whenever possible, subsurface exposures in erosional cut banks, rodent burrow entrances, and ant hills were inspected for evidence of buried cultural deposits. No shovel test pits were excavated. When cultural material was encountered, more closely spaced transects were walked and artifacts were marked with pin flags to define site boundaries and to assess artifact frequency and distributions. Sites were photographed digitally in color. No artifacts were removed from the field.

4.0 INVENTORY RESULTS

4.1 PREVIOUSLY-RECORDED CULTURAL RESOURCES

The records search determined that 18 cultural resource inventories had been previously conducted partly or entirely within one mile of the project area (Table 1), and that four previously identified archaeological sites are within one mile of the project area (Table 2). All four of these sites are historic. None have been evaluated for eligibility to the California Register or National Register of Historic Places (National Register).

TABLE 1. PREVIOUS CULTURAL RESOURCE INVENTORIES WITHIN ONE MILE OF PROJECT AREA.

Report Number	Author	Year	Title	Results
Unknown	Michael K. Lerch San Bernardino County Museum Assoc.	1981	Cultural Resources Assessment of Proposed Improvement Projects of Adelanto Road and Rancho Road, City of Adelanto, San Bernardino County, California	No cultural resources
1061158	Michael J. McIntyre Greenwood & Assoc.	1981	Class III Cultural Resource Inventory: Adelanto-Rinaldi 500 kV Transmission Line Corridors 1, 2 and 3, Los Angeles Department of Water and Power	No cultural resources

Report Number	Author	Year	Title	Results
1062180	Ronald I. Dorn Univ. of California, Berkeley	1983	Cation-Ratio Dating: A New Rock Varnish Age-Determination Technique	No cultural resources
1061479	Dames & Moore	1985	Mead/McCullough-Victorville/Adelanto Transmission Project Technical Report, Vol. IV Cultural Resources	No cultural resources
1061504	Roberta S. Greenwood and John M. Foster Greenwood & Assoc.	1985	Cultural Resources Investigation for Los Angeles Department of Water and Power: Victorville-Rinaldi 500 kV Transmission Line1 Final Report	5 sites; 2 isolated finds
1061927I	Beth Padon, et al. LSA Assoc.	1989	Cultural Resources Assessment, Southern California Gas Company Proposed Line 335 Los Angeles and San Bernardino Counties	2 sites; 5 isolated finds
1062128	Robert E. Parr et al. California State Univ., Bakersfield	1990	Archaeological Inventory, Testing, and Evaluation for the Southern California Edison Kramer-Victor 220 KV Transmission Line Project	5 sites; 6 isolated finds
1062399	Kelly R. McGuire and Leslie Glover Far Western Anthropological Research Group, Inc.	1991	A Cultural Resources Inventory of a Proposed Natural Gas Pipeline Corridor from Adelanto to Ward Valley, San Bernardino County, California	No cultural resources
1062745	R. Paul Hampson, James J. Schmidt, and June A. Schmidt Greenwood & Assoc.	1991	Cultural Resource Investigation: Cajon Pipeline Project, Los Angeles, Riverside, and San Bernardino Counties	No cultural resources
1062651	Lynda M. Blair Harry Reid Center for Environmental Studies, University of Nevada-Las Vegas	1992	Kern River Gas Transmission Company Adelanto Lateral Alternate “A” San Bernardino County, California	13 sites; 14 isolated finds
1062796	Jeanette A. McKenna McKenna et al.	1993	Cultural Resources Investigations, Site Inventory, and Evaluations, The Cajon Pipeline Project Corridor, Los Angeles and San Bernardino Counties, California	11 sites
1063020	Brad Sturm, et al. LSA Assoc.	1993	Adelanto-Lugo Transmission Project Cultural Resources Assessment Draft	No cultural resources
1063070	Andrew L. York Dames & Moore	1995	Class III Cultural Resource Inventory for Los Angeles Department of Water and Power Mead to Adelanto Transmission Line Project: Mt. General, Kramer and Adelanto Divisions	58 sites
1065113	James J. Schmidt Compass Rose Archaeological, Inc.	2005	Kenworth 12 kV, Roadway Sub Inter-set Pole Installation, Adelanto Area, San Bernardino County	No cultural resources
1065506	Wayne H. Bonner and Marnie Aislin-Kay Michael Brandon Associates	2006	Cultural Resource Records Search and Site Visit Results for Cingular Telecommunications Facility Candidate ES-0158-01 (Décor Spas), 17129 Koala Road, Adelanto, San Bernardino County, California	No cultural resources
1065698	Michael Hogan and Bai “Tom” Tang CRM TECH	2007	Historical/Archaeological Resources Survey Report, U.S. Highway 395 Realignment EIR, Victor Valley Area, San Bernardino County, California	No sites

TABLE 2. PREVIOUSLY IDENTIFIED CULTURAL RESOURCES WITHIN ONE MILE OF THE PROJECT AREA.

Site Number	Prehistoric/Historic	Site Type	National Register or California Register Eligibility
CA-SBR-6532H	Historic	Homestead/Dump Possible Burial	Not evaluated
CA-SBR-7562H	Historic	Can Scatter	Not Evaluated
CA-SBR-12255H	Historic	Refuse/Can Scatter	Not Evaluated
CA-SBR-12256H	Historic	Glass/Can scatter	Not Evaluated

Of the previously recorded sites, site CA-SBR-6532 is a historic refuse deposit and homestead site with a possible historic burial suggested by the presence of a crude wooden cross and three cut granite blocks of non-local origin. The site was recorded in 1993.

CA-SBR-7562 consists of a historic can and trash scatter associated with an "old dirt road." The site was recorded in 1993.

CA-SBR-12255H is a small, dispersed historic trash scatter made up primarily of household refuse and cans. The site was recorded in 2006.

CA-SBR-12256H is a small historic trash scatter made up primarily of tin cans and broken window glass. The site was recorded in 2006.

None of these sites falls within the boundary of the current project area.

4.2 NEWLY-RECORDED CULTURAL RESOURCES

As a result of the cultural resource inventory of the Adelanto Solar Power Project area, two archaeological sites (temporary numbers ADL-03 and ADL-04) and two archaeological isolated finds (temporary numbers ADL-01 and ADL-02) were recorded and are located within the project footprint.

TABLE 3. CULTURAL RESOURCES WITHIN PROJECT AREA.

Temporary Number	Age	Resource Type
ADL-01	Historic	One Hole-in-top can
ADL-02	Historic	One Cone-top Can
ADL-03	Probably Historic	One Rock Ring
ADL-04	Historic	Can scatter

4.2.1. Site ADL-03

Site ADL-03 consists of a single rock ring, measuring 23 inches by 18 inches. The interior dimensions of the ring are approximately 15 inches by 10 inches. The oval-shaped ring was formed from eight igneous and metamorphic cobbles with maximum dimensions ranging from 4 to 8 inches. The ring is slightly embedded in the ground surface. The ring is of a size typical of a fire ring, but there is no charcoal, burned rocks, or other evidence of fire. No other artifacts were associated with the ring. The ring is probably relatively recent in age since the rocks show no signs of weathering or patination. Also, historic

sites are much more common than prehistoric sites in the general vicinity (G. Austerman, personal communication 2010).

4.2.2. Site ADL-04

Temporary site ADL-04 is a can scatter. The scatter consists of a concentration of hole-in-top cans, sanitary cans, key-opened processed fish cans, and a variety of other cans in various sizes and shapes. Also included within the site are one ceramic plate fragment, three fragments of ceramic crockery, an exhaust system tail pipe, and one large 40-gallon drum. The exhaust pipe and drum are modern. The can scatter may date from the early 20th century, based on the presence of the hole-in-top cans (Rock 1984:101, 110), to the modern era. Sanitary cans date from 1910 to the present (Rock 1984:110).

The can scatter is roughly triangular in shape, measuring 80 meters from north to south and 50 meters from east to west. All items were on the surface; no evidence was seen of subsurface deposits or features, although no shovel test pits were excavated.

4.3 ISOLATED FINDS

Two isolated finds (temporary numbers ADL-01 and ADL-02) were documented during the Adelanto Substation cultural resource survey. Both date to the historic period.

4.3.1. Isolated Find ADL-01

ADL-01 consists of one hole-in-top can, probably dating from the early 20th century (Rock 1984:101, 110), although hole-in-top cans are still manufactured today. The can measures 4 5/16 inches tall by 3 inches in diameter. The can has two ice pick openings on the top, indicating that it contained a liquid, probably evaporated milk.

4.3.2. Isolated Find ADL-02

ADL-02 consists of one metal cone-top can with a screw cap. It also has a small metal rod bent approximately 90 degrees from the top and welded to the screw cap; it resembles a twist pin. The can is slightly crushed. The can measures approximately 4 7/16 inches tall by 2 7/16 inches in diameter. While the can resembles a soda or beer can, the stamped, rather than crimped, ends suggest that it did not contain a carbonated beverage.

5.0 RESOURCE SIGNIFICANCE

Under CEQA, LADWP must determine whether a proposed project will have a significant effect on unique archaeological resources. PRC 21082.2(g) states that a "unique archaeological resource" means an archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:

1. Contains information needed to answer important scientific research questions and that there is demonstrable public interest in that information.
2. Has a special and particular quality such as being the oldest of its type or the best available example of its type.
3. Is directly associated with a scientifically recognized important prehistoric or historic event or person

A non-unique archaeological resource does not meet these criteria and does not need to be given further consideration other than simple recording, unless it happens to qualify as a historical resource.

CEQA also requires that LADWP determine if a proposed project would cause a substantial adverse change in the significance of a historical resource. Historical resources are those resources listed in or determined to be eligible for listing in the California Register. A historical resource may be listed in the California Register if it meets any of the following criteria:

1. It is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
2. It is associated with the lives of persons important in California's past;
3. It embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic value; or
4. It has yielded or is likely to yield information important in prehistory or history.

The following sections discuss the cultural resources identified during the Adelanto Solar Power Project cultural resources survey in terms of their meeting criteria for being either a unique archaeological resource or eligible for the California Register. The recommendations are summarized in Table 5.

TABLE 5. SIGNIFICANCE OF CULTURAL RESOURCES WITHIN PROJECT BOUNDARIES

Temporary Number	Unique Archaeological Resource	California Register Eligibility Recommendation
ADL-01	No	Not Eligible
ADL-02	No	Not Eligible
ADL-03	No	Not Eligible
ADL-04	No	Not Eligible

5.1 NEWLY-RECORDED CULTURAL RESOURCES

5.1.1. ADL-03

ADL-03 is a possible fire ring containing eight rocks but no evidence of burning and no artifacts associated with it.

As an archaeological resource, there is no evidence that the simple stone ring at ADL-03: 1) contains information needed to answer important scientific research questions; 2) is the best available example of its type; or 3) is associated with an important historic event or person. Therefore, ADL-03 does not qualify as a unique archaeological resource.

Also, ADL-03 does not meet any of the four criteria for California Register eligibility:

> **Criterion 1:** As a simple ring of rocks, the site is too limited to have made a significant contribution to the broad patterns of California History.
>
> **Criterion 2:** ADL-03 is not associated with any person significant in California's past.
>
> **Criterion 3:** The site does not represent an outstanding or unique example of rock rings.
>
> **Criterion 4:** Site recording has exhausted its research potential.

It is recommended that ADL-03 is ineligible to the California Register and that it does not qualify as a historical resource under CEQA.

5.1.2. ADL-04

ADL-03 is a can scatter, probably dating from the earliest 20th century to possibly the late 20th century.

As an archaeological resource, there is no evidence that the can scatter at ADL-04: 1) contains information needed to answer important scientific research questions; 2) is the best available example of its type; or 3) is associated with an important historic event or person. Therefore, ADL-04 does not qualify as a unique archaeological resource.

ADL-04 does not meet any of the four criteria for California Register eligibility:

> **Criterion 1:** ADL-03 is a simple can scatter similar to hundreds of other can scatters in the Mojave Desert. This site would not have made a significant contribution to the history of the region.
>
> **Criterion 2:** As a simple disposal site, the scatter is not likely associated with a person significant in California's past.
>
> **Criterion 3:** The can scatter at SDL-04 resembles many other can scatters found in the desert, and is not distinctive.
>
> **Criterion 4:** ADL-04 has a very limited variety of cans and would contain no new information about local or regional history.

It is recommended that ADL-04 is ineligible to the California Register and that it does not qualify as a historical resource under CEQA.

5.2 ISOLATED FINDS

5.2.1. Isolated Find ADL-01

ADL-01 consists of a single hole-in-top can. As an isolated find, it does not qualify as a unique archaeological resource or a historical resource under CEQA.

5.2.2. Isolated Find ADL-02

ADL-02 consists of a single cone-top with an apparent twist pin on the cap. As an isolated find, it does not qualify as a unique archaeological resource or a historical resource under CEQA.

6.0 RECOMMENDATIONS

During the intensive cultural resource inventory of the Adelanto Solar Power Project area, two archaeological sites (ADL-03 and ADL-04) and two isolated finds (ADL-01 to ADL-02) were identified. None of the resources qualify as unique archaeological resources or historical resources under CEQA.

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APPENDIX A: CALIFORNIA OFFICE OF HISTORIC PRESERVATION SITE FORMS

Site forms are provided under separate cover and are on file at LADWP.