Palen Solar I, LLC's Opening Testimony

Palen Solar Power Project (09-AFC-7)

October 6, 2010

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October 6, 2010

California Energy Commission
Docket Unit
1516 Ninth Street
Sacramento, CA 95814-5512

Subject: **PALEN SOLAR I, LLC'S OPENING TESTIMONY**
PALEN SOLAR POWER PROJECT
DOCKET NO. (09-AFC-7)

Enclosed for filing with the California Energy Commission is the original of **PALEN SOLAR I, LLC'S OPENING TESTIMONY**, for the Palen Solar Power Project (09-AFC-7).

Sincerely,

Marie Mills

PALEN SOLAR POWER PROJECT
PROJECT DESCRIPTION
OPENING TESTIMONY

I. Name: Alice Harron and Michael Cressner

II. Purpose:

Our testimony addresses the subject of Project Description associated with the construction and operation of the Palen Solar Power Project (09-AFC-07).

III. Qualifications:

Michael Cressner: I am presently employed at Solar Millennium LLC, and have been for the past year and am presently an Associate Developer with that organization. I have a Degree in Political Science and I have over 5 years of experience in the development field. I prepared, caused to be prepared, or reviewed the Project Description section of the AFC as well as the post-filing information, data responses, and supplemental filings. A detailed description of my qualifications is contained in the attached resume.

Alice Harron: I am presently employed at Solar Millennium, LLC, and have been for the past year and am presently a Senior Director Masters Degree in Business Administration and a Bachelor's Degree in Economics and I have over 15 years of experience in the field of energy development and finance. I prepared or assisted in the AFC post-filing information, data responses, and supplemental filings for Project Description. A detailed description of my qualifications is contained in the attached resume.

To the best of our knowledge all referenced documents and all of the facts contained in this testimony are true and correct. To the extent this testimony contains opinions, such opinions are our own. We make these statements and provide these opinions freely and under oath for the purpose of constituting sworn testimony in this proceeding.

IV. Exhibits

In addition to this written testimony, we are sponsoring the following exhibits in this proceeding.

Exhibit 1	**Palen Solar I, LLC's Application for Certification Volumes I & II**, dated August 2009, and docketed on August 24, 2009, Section 1.0 & 2.0, Appendix K.
Exhibit 3	**Letter from Assembly Person V. Manuel Perez (Project Support Letter for PSPP & BSPP)**, dated October 21, 2009, and docketed on October 26, 2009.
Exhibit 4	**Palen Solar I, LLC's Data Adequacy Supplement**, dated October 2009, and docketed on October 30, 2009.
Exhibit 14	**Palen Solar I, LLC's Data Response to CEC January 11, 2010 Email Queries Regarding Acreage Clarification**, dated January 13, 2010, and docketed on February 4, 2010.
Exhibit 27	**Palen Solar I, LLC's Initial Comments on the Staff Assessment/ Draft Environmental Impact Statement**, dated May 4, 2010, and docketed on May 4, 2010.

Exhibit 35 **Palen Solar I, LLC's Responses to Questions from the April 28, 29 and May 7, 2010, CEC Workshops - Natural Gas vs. Propane at PSPP and Southern California Edison's Red Bluff Substation Project Description**, dated May 2010 and April 2010 (respectively), and docketed on May 22, 2010.

V. Opinion and Conclusions

We have reviewed the Project Description section of the Revised Staff Assessment and offer the following testimony to be reflected in the Final Decision.

First we want to ensure that the Final Decision allows the construction and operation of either Reconfigured Alternative 2 or Reconfigured Alternative 3 without requiring an Amendment. The difference between the two is that one reflects slight redesign of project layout if certain private land is acquired.

In addition it is important for the Final Decision to capture the following minor modifications to avoid a later Amendment.

Palen Solar I, LLC has made a number of minor modifications to the Palen Solar Power Project (PSPP) since publication in March 2010 of the Staff Assessment/Draft Environmental Impact Statement (SA/DEIS). A number of these changes were addressed in the Palen Solar I, LLC comments on the SA/DEIS which were submitted on May 4, 2010; this submittal included descriptions of these minor engineering changes and evaluations of the environmental implications of these changes, i.e., the effects of those changes (if any) on the previous analysis of Project impacts. The Revised Staff Assessment (RSA) incorporated these changes and also evaluated two additional Project alternative configurations that were devised by the Applicant in response to concerns about potential impacts on the sand transport corridor and the associated partly stabilized sand dunes that represent habitat for the Mojave fringe-toed lizard (MFTL); and the dunes/MFTL habitat that are located within (and adjacent to) the northeastern portions of the originally proposed Project site addressed in the 2009 Application for Certification (AFC). These alternative configurations greatly reduced the Project footprint within the dunes/MFTL area.

The minor PSPP Project changes that should be included in the Final Decision to accurately describe the Project include:

- A Box Culvert for wildlife movement along the access road to the PSPP solar plant site.
- Location of Secondary Access Road
- Changes to the location within the power block and structure height of the Control Building and Changes in Size/Dimensions of the Demineralized Water Storage Tank
- Change in Location of the Evaporation Ponds for Unit 1

BOX CULVERT ALONG SITE ACCESS ROAD

In order to facilitate safe wildlife movement (particularly desert tortoise) in the area of the PSPP site, a box culvert is planned for installation beneath the site access road. The culvert will be installed outside the security fence at the southwest corner of the solar facility site (see Figure 1). The box culvert will be a concrete structure 4 feet high and 6 feet wide. This culvert will serve a passage for minor drainage water flows as well as for desert tortoise. The side slopes on each side of the box culvert will be 3:1 to allow the tortoises to navigate the slope and thus enter and leave the culvert. The box culvert will be buried into the native material so that there will be a minimum of 18 inches of sediment on the floor of the culvert at all times to facilitate tortoise movement. [mc1]

SECONDARY ACCESS ROAD LOCATION

Based on concerns of the Riverside County Fire Department, a secondary access road is planned to provide a second location for site ingress/egress during emergencies. This roadway would extend from the edge of the I-10 right-of-way to the southern portion of the solar plant site. A minimum 20'-wide Class II gravel roadway is planned and there will be a secured gate at the point of facility entry that allows emergency access only. The same location for the secondary access roadway is planned for both Reconfigured Alternatives, as shown on Figures 3 and 4.

CHANGES IN LOCATION AND HEIGHT OF CONTROL BUILDING AND CHANGE IN SIZE OF DEMINERALIZED WATER STORAGE TANK

The following discussion applies to both Reconfigured Alternatives. There have been minor changes to the power blocks of the PSPP although the location and footprint of the power blocks have not changed since the submittal of data for the Project's Reconfigured Alternatives on July 2, 2010 and again on August 18, 2010. The changes are shown on the Figure 5). In summary, the changes are as follows: 1) In order to enhance the ability of control room operators to look out over the solar field while

monitoring facility operations, the height of the Control Building in each power block has been raised from 24' to 36', 2) to ensure sufficient water storage capacity for mirror washing during summer, the size and capacity of the demineralized water tank has been increased; the tank capacity and dimensions would change from 120,000 gallons with dimensions of 16' diameter x 24'high (provided in AFC) to the current proposed 340,000 gallons capacity and dimensions of 40' diameter and 36' high. This change does not alter the footprint of the power block disturbance area.

Please note that there have been other refinements with respect to some other power block equipment, which can be seen on Figure 5. However, these changes are minimal, do not affect the basic locations of the equipment items within the power block, and do not affect the areas to be disturbed.

EVAPORATION POND LOCATIONS

As shown on Figures 2-2 and 2-3 the evaporation ponds for Unit 1 are not located along the eastern boundary but instead will be constructed within the power block of Unit 1 in a similar fashion as the evaporation ponds for Unit 2.

STATE OF CALIFORNIA

Energy Resources
Conservation and Development Commission

In the Matter of:	**DOCKET NO. 09-AFC-07**
Application For Certification for the PALEN SOLAR POWER PROJECT	**DECLARATION OF** Michael Cressner

I, Michael Cressner, declare as follows:

1. I am presently employed by Solar Millennium, LLC, as an Associate, Project Development and Permitting.

2. A copy of my professional qualifications and experience is included herewith (Attachment A to Testimony) and is incorporated by reference in this Declaration.

3. I prepared the attached testimony relating to Project Description for the Palen Solar Power Project (California Energy Commission Docket Number 09-AFC-07).

4. It is my professional opinion that the attached prepared testimony is valid and accurate with respect to issues that it addresses.

5. I am personally familiar with the facts and conclusions related in the attached prepared testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury, under the laws of the State of California, that the foregoing is true and correct to the best of my knowledge and that this declaration was executed on October 5, 2010.

Original Signed
Michael Cressner

STATE OF CALIFORNIA

Energy Resources
Conservation and Development Commission

In the Matter of:	**DOCKET NO. 09-AFC-07**
Application For Certification for the PALEN SOLAR POWER PROJECT	**DECLARATION OF** Alice Harron

I, Alice Harron, declare as follows:

1. I am presently employed by Solar Millennium, LLC, as a Senior Director.

2. A copy of my professional qualifications and experience is included herewith (Attachment A to Testimony) and is incorporated by reference in this Declaration.

3. I prepared the attached testimony relating to Project Description for the Palen Solar Power Project (California Energy Commission Docket Number 09-AFC-07).

4. It is my professional opinion that the attached prepared testimony is valid and accurate with respect to issues that it addresses.

5. I am personally familiar with the facts and conclusions related in the attached prepared testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury, under the laws of the State of California, that the foregoing is true and correct to the best of my knowledge and that this declaration was executed on October 5, 2010.

Original Signed
Alice Harron

PALEN SOLAR POWER PROJECT
ALTERNATIVES
OPENING TESTIMONY

I. Name: Alice Harron and Michael Cressner

II. Purpose:

Our testimony addresses the subject of Alternatives associated with the construction and operation of the Palen Solar Power Project (09-AFC-07).

III. Qualifications:

Michael Cressner: I am presently employed at Solar Millennium LLC, and have been for the past year and am presently an Associate Developer with that organization. I have a Degree in Political Science and I have over 5 years of experience in the development field. I prepared, caused to be prepared, or reviewed the Alternatives section of the AFC as well as the post-filing information, data responses, and supplemental filings. A detailed description of my qualifications is contained in the attached resume.

Alice Harron: I am presently employed at Solar Millennium, LLC, and have been for the past 9 months and am presently a Senior Director Masters Degree in Business Administration and a Bachelor's Degree in Economics and I have over 15 years of experience in the field of energy development and finance. I prepared or assisted in the AFC post-filing information, data responses, and supplemental filings for Alternatives. A detailed description of my qualifications is contained in the attached resume.

To the best of our knowledge all referenced documents and all of the facts contained in this testimony are true and correct. To the extent this testimony contains opinions, such opinions are our own. We make these statements and provide these opinions freely and under oath for the purpose of constituting sworn testimony in this proceeding.

IV. Exhibits

In addition to this written testimony, we are sponsoring the following exhibits in this proceeding.

Exhibit 1	**Palen Solar I, LLC's Application for Certification Volumes I & II**, dated August 2009, and docketed on August 24, 2009, Sections 1.2 & 4.0.
Exhibit 11	**Palen Solar I, LLC's Responses to CEC Data Requests Set 1**, dated January 2010, and docketed on January 22, 2010, Responses 33 through 50.
Exhibit 27	**Palen Solar I, LLC's Initial Comments on the Staff Assessment/ Draft Environmental Impact Statement**, dated May 4, 2010, and docketed on May 4, 2010.

V. Opinion and Conclusions

We have reviewed the Alternatives section of the Revised Staff Assessment and agree that with the analysis and conclusions contained therein.

STATE OF CALIFORNIA

Energy Resources
Conservation and Development Commission

In the Matter of:	**DOCKET NO. 09-AFC-07**
Application For Certification for the PALEN SOLAR POWER PROJECT	**DECLARATION OF** Alice Harron

I, Ray Dracker, declare as follows:

1. I am presently employed by Solar Millennium, LLC, as a Senior Director.

2. A copy of my professional qualifications and experience is included herewith (Attachment A to Testimony) and is incorporated by reference in this Declaration.

3. I prepared the attached testimony relating to Alternatives for the Palen Solar Power Project (California Energy Commission Docket Number 09-AFC-07).

4. It is my professional opinion that the attached prepared testimony is valid and accurate with respect to issues that it addresses.

5. I am personally familiar with the facts and conclusions related in the attached prepared testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury, under the laws of the State of California, that the foregoing is true and correct to the best of my knowledge and that this declaration was executed on October 5, 2010.

Original Signed
Alice Harron

STATE OF CALIFORNIA

Energy Resources
Conservation and Development Commission

In the Matter of:	**DOCKET NO. 09-AFC-07**
Application For Certification for the PALEN SOLAR POWER PROJECT	**DECLARATION OF** Michael Cressner

I, Michael Cressner, declare as follows:

1. I am presently employed by Solar Millennium, LLC, as an Associate, Project Development and Permitting.

2. A copy of my professional qualifications and experience is included herewith (Attachment A to Testimony) and is incorporated by reference in this Declaration.

3. I prepared the attached testimony relating to Alternatives for the Palen Solar Power Project (California Energy Commission Docket Number 09-AFC-07).

4. It is my professional opinion that the attached prepared testimony is valid and accurate with respect to issues that it addresses.

5. I am personally familiar with the facts and conclusions related in the attached prepared testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury, under the laws of the State of California, that the foregoing is true and correct to the best of my knowledge and that this declaration was executed on October 5, 2010.

Original Signed
Michael Cressner

PALEN SOLAR POWER PROJECT
BIOLOGICAL RESOURCES
OPENING TESTIMONY

I. Name: Jennifer Guigliano and Angie Harbin-Ireland

II. Purpose:

Our testimony addresses the subject of Biological Resources associated with the construction and operation of the Palen Solar Power Project (09-AFC-07).

III. Qualifications:

Jennifer Guigliano: I am presently employed at AECOM Design and Planning, and have been for the past 5 years and am presently a Project Director and Associate Principle with that organization. I have a Masters of Engineering Degree in Environmental Engineering and a Bachelors of Science Degree in Combined Science with Biology and Environmental Sciences Minors and I have over 12 years of experience in the field of environmental consulting and natural resources management, including biological resources, water resources and storm water management, and environmental compliance and permitting. I prepared or assisted in the preparation of post-filing information, data responses, and supplemental filings, including the mitigation planning documents for Biological Resources. A detailed description of my qualifications is contained in the attached resume.

Angie Harbin-Ireland: I am presently employed at AECOM Inc., and have been for the past 3 years and am presently a Senior Biologist with that organization. I have a B.S. Degree in Wildlife Biology, an M.S. Degree in Ecology, and I have over 12 years of experience in the field of wildlife biology and ecology. I prepared or assisted in the preparation of the post-filing information, data responses, and supplemental filings to the Application for Certification related to Biological Resources. A detailed description of my qualifications is contained in the attached resume.

To the best of our knowledge all referenced documents and all of the facts contained in this testimony are true and correct. To the extent this testimony contains opinions, such opinions are our own. We make these statements and provide these opinions freely and under oath for the purpose of constituting sworn testimony in this proceeding.

IV. Exhibits

In addition to this written testimony, we are sponsoring the following exhibits in this proceeding.

Exhibit 1	**Palen Solar I, LLC's Application for Certification Volumes I & II**, dated August 2009, and docketed on August 24, 2009, Section 5.3, Appendix F.
Exhibit 4	**Palen Solar I, LLC's Data Adequacy Supplement**, dated October 2009, and docketed on October 30, 2009.
Exhibit 5	**Streambed Alteration Agreement Application**, dated November 2009, and docketed on November 25, 2009.
Exhibit 9	**Palen Solar I, LLC's Application for the California Endangered Species Act Section 2081 (B) Incidental Take Permit and Revised Desert Tortoise Technical Report (including Fall 2009)**, dated January 2010, and docketed on January 13, 2010.
Exhibit 11	**Palen Solar I, LLC's Responses to CEC Data Requests Set 1**, dated January 2010, and docketed on January 22, 2010, Responses 51 through 103.
Exhibit 12	**Palen Solar I, LLC's Supplemental Responses to CEC Data Request Set 1**, dated January 2010, and docketed on January 27, 2010, Response 75.

Exhibit 15	**Palen Solar I, LLC's Response to January 14, 2010 CEC Workshop Queries**, dated February 2010, and docketed on February 8, 2010.
Exhibit 17	**Palen Solar I, LLC's Supplemental Responses to CEC Data Requests, DR-BIO-60 through DR-BIO-62 & Preliminary Geomorphic Aeolian Ancient Lake Shoreline Report**, dated February 2010, and docketed on February 16, 2010, Responses 60 through 62.
Exhibit 21	**Palen Solar I, LLC's Revised Habitat Mitigation & Monitoring Plan Impacts & Compensation Tables**, dated February 12, 2010, and docketed on March 8, 2010.
Exhibit 22	**Palen Solar I, LLC's Draft Biological Assessment**, dated March 2010, and docketed on March 9, 2010.
Exhibit 26	**Palen Solar I, LLC's Spring Survey Protocols**, dated April 2010, and docketed on April 22, 2010.

Exhibit 27	**Palen Solar I, LLC's Initial Comments on the Staff Assessment/ Draft Environmental Impact Statement**, dated May 4, 2010, and docketed on May 4, 2010.
Exhibit 28	**Palen Solar I, LLC's Preliminary Spring 2010 Survey Results for Desert Tortoise, Rare Plants and Jurisdictional Waters**, dated May 7, 2010, and docketed on May 12, 2010.
Exhibit 29	**Palen Solar I, LLC's Initial Comments on the Biological Resources Section of the Staff Assessment/ Draft Environmental Impact Statement**, dated May 12, 2010, and docketed on May 12, 2010.
Exhibit 30	**Palen Solar I, LLC's Responses to Questions from the April 28, 29 and May 7, 2010 CEC Workshops – Draft Aeolian Sand Mitigation Summary Report**, dated May 14, 2010, and docketed on May 19, 2010.
Exhibit 31	**Palen Solar I, LLC's, Responses to Questions from the April 28, 29 and May 7, 2010 CEC Workshops – Mojave Fringe -Toed Lizard Mitigation**, dated May 14, 2010, and docketed on May 19, 2010.

Exhibit 32	**Palen Solar I, LLC's Wildlife Movement and Desert Tortoise Habitat Connectivity Analysis**, dated May 14, 2010, and docketed on May 19, 2010.
Exhibit 38	**Palen Solar I, LLC's Responses to Select CURE Data Requests Set 1**, dated June 14, 2010, and docketed on June 15, 2010.
Exhibit 39	**Palen Solar I, LLC's Responses to Basin and Range Watch Data Requests**, dated June 14, 2010, and docketed on June 15, 2010.
Exhibit 40	**Palen Solar I, LLC's Spring 2010 Survey Results Corrected & Preliminary Impact Calculations**, dated May 27, 2010, and docketed on June 16, 2010.
Exhibit 42	**Palen Solar I, LLC's Supplementary Information - Reconfigured Alternative 2 & Reconfigured Alternative 3**, dated June 2010, and docketed on July 2, 2010.

Exhibit 47	**Palen Solar I, LLC's Responses to CEC Staff's Email Request for Information**, dated August 2010, and docketed on August 5, 2010.
Exhibit 50	**Palen Solar I, LLC's Drainage Diffusers for PSPP**, dated February 15, 2010 and docketed on August 13, 2010.
Exhibit 52	**Letter from the U.S. Department of the Army Regarding Approved Jurisdictional Determination**, dated August 2, 2010, and docketed on August 16, 2010.
Exhibit 53	**Palen Solar I, LLC's Data Responses to Reconfigured Alternatives 2 & 3 – Biological Resources**, dated July 21, 2010, and docketed on August 18, 2010.

Exhibit 54	**Palen Solar I, LLC's Response to CEC Committee's July 29, 2010 Order and Response to CURE's Petition to Compel Production of Information**, dated August 24, 2010, and docketed on August 24, 2010.
Exhibit 56	**Palen Solar I, LLC's Golden Eagle Survey Results**, dated September 13, 2010, and docketed on September 13, 2010.

V. Opinion and Conclusions

We have reviewed the Biological Resources section of the Revised Staff Assessment (RSA). We agree with the analysis, conclusions and Conditions of Certification except for the conclusion and conditions related to Staff's assertion that the project will have significant indirect impacts to Mojave Fringe Toed Lizard due to sand transport and that the project will result in significant impacts to groundwater dependent vegetation. We worked cooperatively with Staff and at the recent workshops have agreement with Staff on minor modifications to the all of the Conditions of Certification, with the exception of **BIO-20** (related to MFTL indirect impacts only), **BIO-23** and **BIO-24** (related to groundwater dependent vegetation). We do agree that with incorporation of the Conditions of Certification as modified below, the Project will not result in significant Biological Resource impacts and will comply with all applicable Biology-related laws, ordinances, regulations and standards (LORS).

For ease of the parties and the Committee, we have included a complete set of the Conditions of Certification below whether or not we propose modifications.

DESIGNATED BIOLOGIST SELECTION AND QUALIFICATIONS[1]

BIO-1 The Project owner shall assign at least one Designated Biologist to the Project. The Project owner shall submit the resume of the proposed Designated Biologist(s), with at least three references and contact information, to the Energy Commission Compliance Project Manager (CPM) for approval in consultation with CDFG and USFWS.

The Designated Biologist must meet the following minimum qualifications:

1. Bachelor's degree in biological sciences, zoology, botany, ecology, or a closely related field;
2. Three years of experience in field biology or current certification of a nationally recognized biological society, such as The Ecological Society of America or The Wildlife Society;
3. Have at least one year of field experience with biological resources found in or near the Project area;
4. Meet the current USFWS Authorized Biologist qualifications criteria (www.fws.gov/ventura/speciesinfo/protocols_guidelines), demonstrate familiarity with protocols and guidelines for the desert tortoise, and be approved by the USFWS; and
5. Possess a California ESA Memorandum of Understanding pursuant to Section 2081(a) for desert tortoise.

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

Verification: At least 30 days prior to construction-related ground disturbance, the Project owner shall submit the resumes of the Designated Biologists(s) along with the completed USFWS Desert Tortoise Authorized Biologist Request Form (www.fws.gov/ventura/speciesinfo/protocols_guidelines) and submit it to the USFWS and the CPM for review and final approval.

No construction-related ground disturbance, grading, boring, or trenching shall commence until an approved Designated Biologist is available to be on site.

If a Designated Biologist needs to be replaced, the specified information of the proposed replacement must be submitted to the CPM at least 10 working days prior to the termination or release of the preceding Designated Biologist. In an emergency, the Project owner shall immediately notify the CPM to discuss the qualifications and

[1] USFWS <www.fws.gov/ventura/speciesinfo/protocols_guidelines/docs/dt> designates biologists who are approved to handle tortoises as "Authorized Biologists." Such biologists have demonstrated to the USFWS that they possess sufficient desert tortoise knowledge and experience to handle and move tortoises appropriately, and have received USFWS approval. Authorized Biologists are permitted to then approve specific monitors to handle tortoises, at their discretion. The California Department of Fish and Game (CDFG) must also approve such biologists, potentially including individual approvals for monitors approved by the Authorized Biologist. **Designated Biologists are the equivalent of Authorized Biologists.** Only Designated Biologists and certain Biological Monitors who have been approved by the Designated Biologist would be allowed to handle desert tortoises

approval of a short-term replacement while a permanent Designated Biologist is proposed to the CPM for consideration.

DESIGNATED BIOLOGIST DUTIES

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

1. Advise the Project owner's Construction and Operation Managers on the implementation of the biological resources conditions of certification;
2. Consult on the preparation of the Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP) to be submitted by the Project owner;
3. Be available to supervise, conduct and coordinate mitigation, monitoring, and other biological resources compliance efforts, particularly in areas requiring avoidance or containing sensitive biological resources, such as special-status species or their habitat;
4. Clearly mark sensitive biological resource areas and inspect these areas at appropriate intervals for compliance with regulatory terms and conditions;
5. Inspect active construction areas where animals may have become trapped prior to construction commencing each day. At the end of the day, inspect for the installation of structures that prevent entrapment or allow escape during periods of construction inactivity. Periodically inspect areas with high vehicle activity (e.g., parking lots) for animals in harm's way;
6. Notify the Project owner and the CPM of any non-compliance with any biological resources condition of certification;
7. Respond directly to inquiries of the CPM regarding biological resource issues;
8. Maintain written records of the tasks specified above and those included in the BRMIMP. Summaries of these records shall be submitted in the Monthly Compliance Report and the Annual Compliance Report;
9. Train the Biological Monitors as appropriate, and ensure their familiarity with the BRMIMP, Worker Environmental Awareness Program (WEAP) training, and USFWS guidelines on desert tortoise surveys and handling procedures <www.fws.gov/ventura/speciesinfo/protocols_guidelines>; and
10. Maintain the ability to be in regular, direct communication with representatives of CDFG, USFWS, and the CPM, including notifying these agencies of dead or injured listed species and reporting special-status species observations to the California Natural Diversity Database (CNDDB).

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

BIOLOGICAL MONITOR SELECTION AND QUALIFICATIONS

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

Biological Monitor(s) training by the Designated Biologist shall include familiarity with the conditions of certification, BRMIMP, WEAP, and USFWS guidelines on desert tortoise surveys and handling procedures <www.fws.gov/ventura/speciesinfo/protocols_guidelines>.

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

BIOLOGICAL MONITOR DUTIES

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

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

DESIGNATED BIOLOGIST AND BIOLOGICAL MONITOR AUTHORITY

BIO-5 The Project owner's construction/operation manager shall act on the advice of the Designated Biologist and Biological Monitor(s) to ensure conformance with the biological resources conditions of certification. The Project owner

shall provide Energy Commission staff with reasonable access to the Project site under the control of the Project owner and shall otherwise fully cooperate with the Energy Commission's efforts to verify the Project owner's compliance with, or the effectiveness of, mitigation measures set forth in the conditions of certification. The Designated Biologist shall have the authority to immediately stop any activity that is not in compliance with these conditions and/or order any reasonable measure to avoid take of an individual of a listed species. If required by the Designated Biologist and Biological Monitor(s) the Project owner's construction/operation manager shall halt all site mobilization, ground disturbance, grading, boring, trenching, and operation activities in areas specified by the Designated Biologist. The Designated Biologist shall:

1. Require a halt to all activities in any area when determined that there would be an unauthorized adverse impact to biological resources if the activities continued;
2. Inform the Project owner and the construction/operation manager when to resume activities; and
3. Notify the CPM if there is a halt of any activities and advise them of any corrective actions that have been taken or would be instituted as a result of the work stoppage. If the work stoppage relates to desert tortoise or any other federal- or state-listed species, the Carlsbad Office of the USFWS and the Ontario Office of the CDFG shall also be notified.

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

Verification: The Project owner shall ensure that the Designated Biologist or Biological Monitor notifies the CPM and BLM immediately (and no later than the morning following the incident, or Monday morning in the case of a weekend) of any non-compliance or a halt of any site mobilization, ground disturbance, grading, construction, or operation activities. If the non-compliance or halt to construction or operation relates to desert tortoise or any other federal- or state-listed species, the Project owner shall also notify Carlsbad Office of the USFWS and the Ontario Office of the CDFG at the same time. The Project owner shall notify the CPM of the circumstances and actions being taken to resolve the problem.

Whenever corrective action is taken by the Project owner, a determination of success or failure will be made by the CPM in consultation with BLM, USFWS and CDFG within 5 working days after receipt of notice that corrective action is completed, or the Project owner would be notified by the CPM that coordination with other agencies would require additional time before a determination can be made.

WORKER ENVIRONMENTAL AWARENESS PROGRAM (WEAP)

BIO-6 The Project owner shall develop and implement a Project-specific Worker Environmental Awareness Program (WEAP) and shall secure approval for the WEAP from the CPM. The Project owner shall also provide the USFWS and CDFG a copy of all portions of the WEAP relating to desert tortoise and any other federal or state-listed species for review and comment. The WEAP shall be administered to all onsite personnel including surveyors, construction

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

1. Be developed by or in consultation with the Designated Biologist and consist of an on-site or training center presentation in which supporting written material and electronic media, including photographs of protected species, is made available to all participants;
2. Discuss the locations and types of sensitive biological resources on the Project site and adjacent areas, and explain the reasons for protecting these resources; provide information to participants that no snakes or other wildlife shall be harmed;
3. Place special emphasis on desert tortoise, including information on physical characteristics, distribution, behavior, ecology, sensitivity to human activities, legal protection, penalties for violations, reporting requirements, and protection measures;
4. Include a discussion of fire prevention measures to be implemented by workers during Project activities and request workers to: a) dispose of cigarettes and cigars appropriately and not leave them on the ground or buried, b) keep vehicles on graveled or well-maintained roads at all times to prevent vehicle exhaust systems from coming in contact with roadside weeds, c) use and maintain approved spark arresters on all power equipment, and d) keep a fire extinguisher on hand at all times
5. Describe the temporary and permanent habitat protection measures to be implemented at the Project site;
6. Identify whom to contact if there are further comments and questions about the material discussed in the program; and
7. Include a training acknowledgment form to be signed by each worker indicating that they received training and shall abide by the guidelines.

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

Verification: At least 30 days prior to start of construction-related ground disturbance, the Project owner shall provide to the CPM for review and approval and to BLM, USFWS and CDFG a copy of the final WEAP and all supporting written materials and electronic media prepared or reviewed by the Designated Biologist and a resume of the person(s) administering the program.

The Project owner shall provide in the Monthly Compliance Report the number of persons who have completed the training in the prior month and a running total of all persons who have completed the training to date. At least ~~30~~ 10 days prior to construction-related ground disturbance activities the Project owner shall submit two copies of the approved final WEAP.

Training acknowledgement forms signed during construction shall be kept on file by the Project owner for at least 6 months after the start of commercial operation.

Throughout the life of the Project, the WEAP shall be repeated annually for permanent employees, and shall be routinely administered within 1 week of arrival to any new construction personnel, foremen, contractors, subcontractors, and other personnel potentially working within the Project area. Upon completion of the orientation, employees shall sign a form stating that they attended the program and understand all protection measures. These forms shall be maintained by the Project owner and shall be made available to the CPM, BLM, USFWS and CDFG and upon request. Workers shall receive and be required to visibly display a hardhat sticker or certificate that they have completed the training.

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

BIOLOGICAL RESOURCES MITIGATION IMPLEMENTATION AND MONITORING PLAN

BIO-7 The Project owner shall develop a Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP), and shall submit two copies of the proposed BRMIMP to the CPM and BLM for review and approval and USFWS and CDFG for review. The Project owner shall implement the measures identified in the approved BRMIMP. The BRMIMP shall incorporate avoidance and minimization measures described in final versions of the Desert Tortoise Translocation Plan, the Raven Management Plan, the Closure, Conceptual Restoration Plan, the Burrowing Owl Mitigation and Monitoring Plan, the Weed Management Plan, and all other individual biological mitigation and/or monitoring plans associated with the Project. The Project owner shall provide to CDFG and USFWS a copy of all portions of the BRMIMP relating to desert tortoise and any other federal or state-listed species for review and comment.

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

1. All biological resources mitigation, monitoring, and compliance measures proposed and agreed to by the Project owner;
2. All biological resources conditions of certification identified as necessary to avoid or mitigate impacts;
3. All biological resource mitigation, monitoring, and compliance measures required in federal agency terms and conditions, such as those provided in the USFWS Biological Opinion;
4. All sensitive biological resources to be impacted, avoided, or mitigated by Project construction, operation, and closure;

5. All required mitigation measures for each sensitive biological resource;
6. All measures that shall be taken to avoid or mitigate temporary disturbances from construction activities;
7. Duration for each type of monitoring and a description of monitoring methodologies and frequency;
8. Performance standards to be used to help decide if/when proposed mitigation is or is not successful;
9. All performance standards and remedial measures to be implemented if performance standards are not met;
10. Biological resources-related facility closure measures including a description of funding mechanism(s);
11. A process for proposing plan modifications to the CPM and appropriate agencies for review and approval; and
12. A requirement to submit any sightings of any special-status species that are observed on or in proximity to the Project site, or during Project surveys, to the CNDDB per CDFG and BLM requirements.

Verification: The Project owner shall submit the draft BRMIMP to the CPM and BLMat least 30 days prior to start of any preconstruction site mobilization and construction-related ground disturbance, grading, boring, and trenching. At the same time the Project owner shall provide to CDFG and USFWS a copy of all portions of the draft BRMIMP relating to desert tortoise and any other federal or state-listed species. The Project owner shall provide final BRMIMP to the CPM, BLM, CDFG and USFWS at least 7 days prior to start of any construction-related ground disturbance, grading, boring, and trenching. The BRMIMP shall contain all of the required measures included in all biological Conditions of Certification. No construction-related ground disturbance, grading, boring, or trenching may occur prior to approval of the final BRMIMP by the CPM and BLM.

If any permits have not yet been received when the final BRMIMP is submitted, these permits shall be submitted to the CPM within 5 days of their receipt, and the BRMIMP shall be revised or supplemented to reflect the permit condition(s). The Project owner shall submit to the CPM and BLM the revised or supplemented BRMIMP within 10 days following the Project owner's receipt of any additional permits. Under no circumstances shall ground disturbance proceed without implementation of all permit conditions.

To verify that the extent of construction disturbance does not exceed that described in these conditions, the Project owner shall submit aerial photographs, at an approved scale, taken before and after construction to the CPM, BLM, USFWS and CDFG. The first set of aerial photographs shall reflect site conditions prior to any preconstruction site mobilization and construction-related ground disturbance, grading, boring, and trenching, and shall be submitted prior to initiation of such activities. The second set of aerial photographs shall be taken subsequent to completion of construction, and shall be submitted to the CPM, BLM, USFWS and CDFG no later than 90 days after completion of construction. The Project owner shall also provide a final accounting in

whole acres of vegetation communities/cover types present before and after construction. Construction acreages shall be rounded to the nearest acre.

Any changes to the approved BRMIMP must be approved by the CPM and BLM in consultation with CDFG and USFWS.

Implementation of BRMIMP measures (for example, construction activities that were monitored, species observed) shall be reported in the Monthly Compliance Reports by the Designated Biologist. Within 30 days after completion of Project construction, the Project owner shall provide to the CPM, for review and approval, a written construction termination report identifying which items of the BRMIMP have been completed, a summary of all modifications to mitigation measures made during the Project's preconstruction site mobilization and construction-related ground disturbance, grading, boring, and trenching, and which mitigation and monitoring items are still outstanding.

IMPACT AVOIDANCE AND MINIMIZATION MEASURES

BIO-8 The Project owner shall undertake the following measures to manage the Project site and related facilities during construction, operation and maintenance in a manner to avoid or minimize impacts to biological resources:

1. Limit Disturbance Areas. Minimize soil disturbance by locating staging areas, laydowns, and temporary parking or storage for linears in existing disturbed areas. Equipment maintenance and refueling shall not be conducted within 100 feet of any sensitive resource (for example, waters of the state, desert dry wash woodland, dune habitats and rare plant populations). Limit the width of the work area near sensitive resources. Avoid blading temporary access roads where feasible and instead drive over and crush the vegetation to preserve the seed bank and biotic soil crusts. The boundaries of all areas to be disturbed (including staging areas, access roads, and sites for temporary placement of spoils) shall be delineated with stakes and flagging prior to construction activities in consultation with the Designated Biologist. Spoils and topsoil shall be stockpiled in disturbed areas lacking native vegetation and which do not provide habitat for special-status species. Parking areas, staging and disposal site locations shall similarly be located in areas without native vegetation or special-status species habitat. All disturbances, Project vehicles and equipment shall be confined to the flagged areas.

2. Minimize Road Impacts. New and existing roads that are planned for construction, widening, or other improvements shall not extend beyond the flagged impact area as described above. All vehicles passing or turning around would do so within the planned impact area or in previously disturbed areas. Where new access is required outside of existing roads or the construction zone, the route shall be clearly marked (i.e., flagged and/or staked) prior to the onset of construction.

3. Minimize Traffic Impacts. Vehicular traffic during Project construction and operation shall be confined to existing routes of travel to and from the Project site, and cross country vehicle and equipment use outside

designated work areas shall be prohibited. The speed limit shall not exceed 25 miles per hour within the Project area, on maintenance roads for linear facilities, or on access roads to the Project site.

4. Monitor During Construction. In areas that have not been fenced with desert tortoise exclusion fencing and cleared, the Designated Biologist shall be present at the construction site during all Project activities that have potential to disturb soil, vegetation, and wildlife. The Designated Biologist or Biological Monitor shall ~~walk immediately~~ clear ahead of equipment during brushing and grading activities. If desert tortoises are found during construction monitoring, procedures outlined in **BIO-9** shall be implemented.

5. Minimize Impacts of Transmission/Pipeline Alignments, Roads, and Staging Areas. Staging areas for construction on the plant site shall be within the area that has been fenced with desert tortoise exclusion fencing and cleared. For construction activities outside of the plant site (transmission line, pipeline alignments) access roads, pulling sites, and storage and parking areas shall be designed, installed, and maintained with the goal of minimizing impacts to native plant communities and sensitive biological resources. Transmission lines and all electrical components shall be designed, installed, and maintained in accordance with the Avian Power Line Interaction Committee's (APLIC's) S*uggested Practices for Avian Protection on Power Lines* (APLIC 2006) and *Mitigating Bird Collisions with Power Lines* (APLIC 1994) to reduce the likelihood of large bird electrocutions and collisions. Where feasible avoid impacts to desert washes and special-status plants by adjusting the locations of poles and laydown areas, and the alignment of the roads and pipelines. Construction drawings and grading plans shall depict the locations of sensitive resources and demonstrate where temporary impacts to sensitive resources can be avoided and where they cannot.

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

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

8. Minimize Noise Impacts. A continuous low-pressure technique shall be used for steam blows, to the extent possible, in order to reduce noise levels in sensitive habitat proximate to the Project site. Loud construction activities (e.g., unsilenced high pressure steam blowing, pile driving, or other) shall be avoided from February 15 to April 15, when it would result in noise levels over 65 dBA in nesting habitat (excluding noise from passing vehicles). Loud construction activities may be permitted from February 15 to April 15 only if:

    a. The Designated Biologist provides documentation (i.e., nesting bird data collected using methods described in **BIO-15** and maps depicting location of the nest survey area in relation to noisy construction) to the

CPM indicating that no active nests would be subject to 65 dBA noise, OR

b. The Designated Biologist or Biological Monitor monitors active nests within the range of construction-related noise exceeding 65 dBA. The monitoring shall be conducted in accordance with Nesting Bird Monitoring and Management Plan approved by the CPM. The Plan shall include adaptive management measures to prevent disturbance to nesting birds from construction related noise. Triggers for adaptive management shall be evidence of Project-related disturbance to nesting birds such as: agitation behavior (displacement, avoidance, and defense); increased vigilance behavior at nest sites; changes in foraging and feeding behavior, or nest site abandonment. The Nesting Bird Monitoring and Management Plan shall include a description of adaptive management actions, which shall include, but not be limited to, cessation of construction activities that are deemed by the Designated Biologist to be the source of disturbance to the nesting bird.

9. Avoid Vehicle Impacts to Desert Tortoise. Parking and storage shall occur within the area enclosed by desert tortoise exclusion fencing to the extent feasible. No vehicles or construction equipment parked outside the fenced area shall be moved prior to an inspection of the ground beneath the vehicle for the presence of desert tortoise. If a desert tortoise is observed outside the areas ~~permanently~~ fenced with desert tortoise exclusion fencing it shall be left to move on its own. If it does not move within 15 minutes, a Designated Biologist or Biological Monitor under the Designated Biologist's direct supervision may move it out of harms way as described in the USFWS Desert Tortoise Field Manual (USFWS 2009a)

10. Install Box Culvert. To provide for connectivity for desert tortoise and other wildlife, the Project owner shall install a box culvert suitable for passage by desert tortoise and other wildlife under the Project Site Access Road.

11. Avoid Wildlife Pitfalls. To avoid trapping desert tortoise and other wildlife in trenches, pipes or culverts, the following measures shall be implemented:

    a. Backfill Trenches. At the end of each work day, the Designated Biologist shall ensure that all potential wildlife pitfalls (trenches, bores, and other excavations) outside the area fenced with desert tortoise exclusion fencing have been backfilled. If backfilling is not feasible, all trenches, bores, and other excavations shall be sloped at a 3:1 ratio at the ends to provide wildlife escape ramps, or covered completely to prevent wildlife access, or fully enclosed with desert tortoise-exclusion fencing. All trenches, bores, and other excavations outside the areas permanently fenced with desert tortoise exclusion fencing shall be inspected periodically throughout the day, at the end of each workday, and at the beginning of each day by the Designated Biologist or a Biological Monitor. Should a tortoise or other wildlife become trapped, the Designated Biologist or Biological Monitor shall move the tortoise out of harm's way as described in the USFWS Desert Tortoise Field

~~Manuary~~ Manual (USFWS 2009a). Any wildlife encountered during the course of construction shall be allowed to leave the construction area unharmed.

b. Avoid Entrapment of Desert Tortoise. Any construction pipe, culvert, or similar structure with a diameter greater than 3 inches, stored less than 8 inches aboveground and within desert tortoise habitat (i.e., outside the permanently fenced area) for one or more nights, shall be inspected for tortoises before the material is moved, buried or capped. As an alternative, all such structures may be capped before being stored outside the fenced area, or placed on elevated pipe racks. These materials would not need to be inspected or capped if they are stored within the permanently fenced area after the clearance surveys have been completed.

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

13. Dispose of Road-killed Animals. Road killed animals or other carcasses detected by personnel on roads associated with the Project area will be reported immediately to a Biological Monitor or Designated Biologist (or Project Environmental Compliance Monitor, during Project operations), who will promptly remove the roadkill. For special-status species road-kill, the Biological Monitor or Designated Biologist (or Project Environmental Compliance Monitor, during Project operations) shall contact CDFG and USFWS within 1 working day of detection of the carcass for guidance on disposal or storage of the carcass; all other road kill shall be disposed of promptly. The Biological Monitor shall provide the special-status species record as described in **BIO-11** below.

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

15. Worker Guidelines. During construction all trash and food-related waste shall be placed in self-closing containers and removed daily from the site. Workers shall not feed wildlife or bring pets to the Project site. Except for law enforcement personnel, no workers or visitors to the site shall bring firearms or weapons. Vehicular traffic shall be confined to existing routes

of travel to and from the Project site, and cross country vehicle and equipment use outside designated work areas shall be prohibited. The speed limit when traveling on dirt access routes within desert tortoise habitat shall not exceed 25 miles per hour.

16. Implement Sediment ~~Erosion~~ Control Measures Near Desert Washes. Standard erosion control measures shall be implemented for all phases of construction and operation where sediment run-off from exposed slopes threatens to enter waters of the state. Sediment and other flow-restricting materials shall be moved to a location where they shall not be washed back into the stream. ~~All disturbed soils and roads within the Project site shall be stabilized to reduce erosion potential, both during and following construction.~~ Areas of disturbed soils (access and staging areas) which slope toward drainages shall be stabilized to reduce erosion potential.

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

18. Control Unauthorized Use of the Project Access Roads. The secondary access road shall be gated at both ends and restricted to emergency response personnel as per proposed **COC WORKER SAFETY-6**. The Project owner shall also monitor and control any unauthorized use of the Project roads with gates, signage, and fencing as necessary to minimize traffic-related roadkills and ORV disturbance off-roads.

19. Implement Erosion Control Measures. All disturbed soils and roads within the Project site shall be stabilized to reduce erosion potential, both during and following construction. All areas subject to temporary disturbance shall be restored to pre-project grade and stabilized to prevent erosion and promote natural revegetation. Temporarily disturbed areas within the Project area include, but are not limited to: linear facilities, temporary access roads, temporary lay-down and staging areas. If erosion control measures include the use of seed, only locally native plant species from a local seed source shall be used. Local seed includes seeds from plants within the Chuckwalla Valley or Colorado River Hydrologic Units.

20. Avoid Spreading Weeds. Prior to the start of construction, flag and avoid dense populations of highly invasive noxious weeds. If these areas cannot be avoided, they shall be pre-treated by the methods described in BIO-14 (Weed Management Plan). Noxious weeds and other invasive non-native plants in the temporarily disturbed areas shall be managed according to the requirements in BIO-14.

21. Salvage Topsoil. Topsoil from the Project site shall be salvaged, preserved and re-used for restoration of temporarily disturbed areas. Salvaged topsoil shall be collected, stored and applied in a way that maintains the viability of seed and soil crusts. The Project owner shall excavate and collect the upper soil layer (the top 1 to 2 inches that

includes the seed bank and biotic soil crust) as well as the lower soil layer up to a depth of 6 to 8 inches. The upper and lower soil layers shall be stockpiled separately in areas that will not be impacted by other grading, flooding, erosion, or pollutants. If the soil is to be stored more than 2 weeks it shall be spread out to a depth of no more than 6 inches to maintain the seed and soil crust viability. The Project owner shall install temporary construction fencing around stockpiled topsoil, and signage that indicates whether the pile is the upper layer seed bank, or the lower layer, and clearly indicates that the piles are for use only in erosion control. After construction, the Project owner shall replace the topsoil in the temporarily disturbed areas in the reverse order of stockpiling, starting with the 6-8 inch layer of subsoil, and then the seed-containing upper layer using a harrow or similar equipment to thinly distribute the layer to depths no greater than 1 to 2 inches.

22. Decommission Temporary Access Roads with Vertical Mulching. Discourage ORV use of temporary construction roads by installing vertical mulching at the head of the road to a distance necessary to obscure the road from view. Boulder barricades and gates shall not be used unless the remainder of the site is fenced to prevent driving around the gate or barricade. Designated ORV routes and roads shall not be closed.

Verification: All mitigation measures and their implementation methods shall be included in the BRMIMP and implemented. Implementation of the measures shall be reported in the Monthly Compliance Reports by the Designated Biologist. Within 30 days after completion of Project construction, the Project owner shall provide to the CPM, for review and approval, a written construction termination report identifying how measures have been completed. As part of the Annual Compliance Report, each year following construction the Designated Biologist shall provide a report to the CPM that describes compliance with avoidance and minimization measures to be implemented during operation (for example, a summary of the incidence of roadkilled animals during the year, implementation of measures to avoid toxic spills, erosion and sedimentation, efforts to enforce worker guidelines, etc.).

No less than 30 days prior to construction-related ground disturbance the Project owner shall provide the CPM, USFWS and CDFG with plans showing the design of a culvert under the Project Site Access Road that would provide access for desert tortoise and other wildlife. No less than 30 days after of completion of construction of the Project site access road the Project owner shall provide as-built drawings of the culvert.

If loud construction activities are proposed between February 15 to April 15 which would result in noise levels over 65 dBA in nesting habitat, the Project owner shall submit nest survey results (as described in 8a) to the CPM no more than 7 days before initiating such construction. If an active nest is detected within this survey area the Project owner shall submit a Nesting Bird Monitoring and Management Plan to the CPM for review and approval no more than 7 days before initiating noisy construction.

DESERT TORTOISE CLEARANCE SURVEYS AND FENCING

BIO-9 The project owner shall undertake appropriate measures to manage the project site and related facilities in a manner to avoid or minimize impacts to desert tortoise**.** Methods for clearance surveys, fence specification and installation, tortoise handling, artificial burrow construction, egg handling and other procedures shall be consistent with those described in the USFWS' Desert Tortoise Field Manual (USFWS 2009) <http://www.fws.gov/ventura/speciesinfo/protocols_guidelines> or more current guidance provided by CDFG and USFWS. The project owner shall also implement all terms and conditions described in the Biological Opinion prepared by USFWS. The project owner shall implement the following measures:

1. Desert Tortoise Fencing along Interstate 10. To avoid increases in vehicular-related mortality from disruption of local movement patterns along the existing ephemeral wash systems, permanent desert tortoise-proof fencing shall be installed along the existing freeway right-of-way fencing, on both sides of Interstate 10 (I-10) between the wash on the westernmost end of the proposed Project site and the easternmost wash associated with the proposed Project site (labeled as #10 and #12 in Wildlife Movement and Desert Tortoise Habitat [tn56755], AECOM 2010f). The project owner shall secure approval from California Departement of Transporation for the installation and maintenance of desert tortoise exclusion fencing prior to construction or repair. If either Reconfigured Alternative 2 or Reconfigured Alternative 3 is selected, the fence shall extend from the westernmost wash (#10) to the wash immediately east of the alternative disturbance area (#13). The tortoise fencing shall be designed to direct tortoises to existing undercrossing to provide safe passage under the freeway, and shall be ~~regularly~~ inspected per 2.d. and maintained for the life of the Project.

2. Desert Tortoise Exclusion Fence Installation. To avoid impacts to desert tortoises, permanent exclusion fencing shall be installed along the permanent perimeter security fence (boundaries) as phases are constructed. Temporary fencing shall be installed along any subset of the plant site phasing that does not correspond to permanent perimeter fencing. Temporary fencing shall be installed along linear features unless a Biological Monitor is present in the immediate vicinity of construction activities for the linear facility. All fencing shall be flagged and surveyed within 24 hours prior to the initiation of fence construction. Clearance surveys of the desert tortoise exclusionary fence and utility rights-of-way alignments shall be conducted by the Designated Biologist(s) using techniques outlined in the Desert Tortoise Field Manual (USFWS 2009) and may be conducted in any season with USFWS and CDFG approval. Biological Monitors may assist the Designated Biologist under his or her supervision. These fence clearance surveys shall provide 100-percent coverage of all areas to be disturbed and an additional transect along both sides of the fence line. Disturbance associated with desert tortoise exclusionary fence construction shall not exceed 30 feet on either side of

the proposed fence alignment. Prior to the surveys the project owner shall provide to the CPM, CDFG and USFWS a figure clearly depicting the limits of construction disturbance for the proposed fence installation. The fence line survey area shall be 90 feet wide centered on the fence alignment. Where construction disturbance for fence line installation can be limited to 15 feet on either side of the fence line, this fence line survey area may be reduced to an area approximately 60 feet wide centered on the fence alignment. Transects shall be no greater than 15 feet apart. For the I-10 desert tortoise exclusion fence, the Project Owner may have a DB present to clear ahead of fence construction and be present in the immediate vicinity of fence installation activities. Desert tortoise located within the utility ROW alignments shall be moved out of harm's way in accordance with the USFWS Desert Tortoise Field Manual (USFWS 2009). Any desert tortoise detected during clearance surveys for fencing within the plant site and along the perimeter fence alignment shall be translocated and monitored in accordance with the Desert Tortoise Relocation/Translocation Plan (BIO-10). Tortoise shall be handled by the Designated Biologist(s) in accordance with the USFWS' Desert Tortoise Field Manual (USFWS 2009).

a. Timing and Supervision of Fence Installation. The exclusion fencing shall be installed in any area subject to disturbance prior to the onset of site clearing and grubbing in that area. The fence installation shall be supervised by the Designated Biologist and monitored by the Biological Monitors to ensure the safety of any tortoise present.

b. Fence Material and Installation. All desert tortoise exclusionary fencing shall be constructed in accordance with the USFWS' Desert Tortoise Field Manual (USFWS 2009) (Chapter 8 – Desert Tortoise Exclusion Fence).

c. Security Gates. Security gates shall be designed with minimal ground clearance to deter ingress by tortoises. The gates may be electronically activated to open and close immediately after the vehicle(s) have entered or exited to prevent the gates from being kept open for long periods of time.

d. Fence Inspections. Following installation of the desert tortoise exclusion fencing for both the permanent ~~site fencing~~ and temporary fencing ~~in the utility corridors~~, the fencing shall be regularly inspected. If tortoise were moved out of harm's way during fence construction, permanent and temporary fencing shall be inspected at least two times a day for the first 7 days to ensure a recently moved tortoise has not been trapped within the fence. Thereafter, permanent fencing shall be inspected monthly ~~and during~~ and within 24 hours following all major rainfall events or after notification of an accident. A major rainfall event is defined as one for which flow is detectable within the fenced drainage. Any damage to the fencing shall be temporarily repaired immediately to keep tortoises out of the site, and permanently repaired within 48 hours of observing damage. Repairs on I-10 fencing shall

occur after any required authorization from Caltrans for work within their Right-of-Way. Inspections of permanent site fencing shall occur for the life of the project. Temporary fencing shall be inspected weekly and, where drainages intersect the fencing, during and within 24 hours following major rainfall events. All temporary fencing shall be repaired immediately upon discovery and, if the fence may have permitted tortoise entry while damaged, the Designated Biologist shall inspect the area for tortoise.

3. Desert Tortoise Clearance Surveys within the Plant Site. Clearance surveys shall be conducted in accordance with the USFWS Desert Tortoise Field Manual (USFWS 2009) (Chapter 6 – Clearance Survey Protocol for the Desert Tortoise – Mojave Population) and shall consist of two surveys covering 100 percent the project area by walking transects no more than 15-feet apart. If a desert tortoise is located on the second survey, a third survey shall be conducted. Each separate survey shall be walked in a different direction to allow opposing angles of observation. ~~Clearance surveys for nonlinear areas of Phase 1A may be conducted outside the active season.~~ Clearance surveys of the ~~remaining portions of the power~~ plant site may only be conducted when tortoises are most active (April through May or September through October) unless the project receives approval from CDFG and USFWS. Clearance surveys of linear features may be conducted during anytime of the year. ~~Surveys outside of the active season in areas other than Phase 1A require approval by USFWS and CDFG.~~ Any tortoise located during clearance surveys of the power plant site and linear features shall be translocated or relocated and monitored in accordance with the Desert Tortoise Relocation/Translocation Plan:

   a. Burrow Searches. During clearance surveys all desert tortoise burrows, and burrows constructed by other species that might be used by desert tortoises, shall be examined by the Designated Biologist, who may be assisted by the Biological Monitors, to assess occupancy of each burrow by desert tortoises and handled in accordance with the USFWS Desert Tortoise Field Manual (USFWS 2009). To prevent reentry by a tortoise or other wildlife, all burrows shall be collapsed once absence has been determined in accordance with the Desert Tortoise Relocation/Translocation Plan. Tortoises taken from burrows and from elsewhere on the power plant site shall be relocated or translocated as described in the Desert Tortoise Relocation/Translocation Plan.

   b. Burrow Excavation/Handling. All potential desert tortoise burrows located during clearance surveys would be excavated by hand, tortoises removed, and collapsed or blocked to prevent occupation by desert tortoises in accordance with the Desert Tortoise Relocation/Translocation Plan. All desert tortoise handling, and removal, and burrow excavations, including nests, would be conducted by the Designated Biologist, who may be assisted by a Biological

Monitor in accordance with the USFWS Desert Tortoise Field Manual (USFWS 2009).

4. Monitoring Following Clearing. Following the desert tortoise. clearance and removal from the power plant site and utility corridors, workers and heavy equipment shall be allowed to enter the project site to perform clearing, grubbing, leveling, and trenching activities. A Designated Biologist or Biological Monitor shall be onsite for clearing and grading activities to move tortoises missed during the initial tortoise clearance survey. Should a tortoise be discovered, it shall be relocated or translocated as described in the Desert Tortoise Relocation/Translocation Plan

5. Reporting. The Designated Biologist shall record the following information for any desert tortoises handled: a) the locations (narrative and maps) and dates of observation; b) general condition and health, including injuries, state of healing and whether desert tortoise voided their bladders; c) location moved from and location moved to (using GPS technology); d) gender, carapace length, and diagnostic markings (i.e., identification numbers or marked lateral scutes); e) ambient temperature when handled and released; and f) digital photograph of each handled desert. Desert tortoise moved from within project areas shall be marked and monitored in accordance with the Desert Tortoise Relocation/Translocation Plan.

Verification: All mitigation measures and their implementation methods shall be included in the BRMIMP and implemented. Implementation of the measures shall be reported in the Monthly Compliance Reports by the Designated Biologist. Within 30 days after completion of desert tortoise clearance surveys the Designated Biologist shall submit a report to BLM, the CPM, USFWS, and CDFG describing implementation of each of the mitigation measures listed above. The report shall include the desert tortoise survey results, capture and release locations of any relocated desert tortoises, and any other information needed to demonstrate compliance with the measures described above.

Within 6 months of completion of desert tortoise exclusion fence for Phase 1, I-10 desert tortoise exlusion fencing shall be installed. Within ~~6~~ 3 months of ~~docketing of the Energy Commission Final Decision~~ completion of I-10 desert tortoise exclusion fence contruction, the Project owner shall provide the CPM, BLM, USFWS, and CDFG with ~~as-built plans representing existing field conditions upon completion of desert tortoise exclusion fence construction~~ maps as well as photographic documentation showing the design and location of the fencing on both sides of I-10 south of the Project site.

The Project Owner shall provide evidence of approval from Caltrans for installation of DT fencing along I-10 wthin their right-of-way at least 30-days prior to construction of the fencing.

DESERT TORTOISE RELOCATION/TRANSLOCATION PLAN

BIO-10 The Project owner shall develop and implement a final Desert Tortoise Relocation/Translocation Plan (Plan) that is consistent with current USFWS approved guidelines, and meets the approval of the CPM. The Plan shall

include guidance specific to each of the two phases of Project construction, as described in **BIO-29** (Phasing), and shall include measures to minimize the potential for repeated translocations of individual desert tortoises. The goals of the Desert Tortoise Relocation/Translocation Plan shall be to: relocate/translocate all desert tortoises from the project site to nearby suitable habitat; minimize impacts on resident desert tortoises outside the project site; minimize stress, disturbance, and injuries to relocated/translocated tortoises; and assess the success of the translocation effort through monitoring. The final Plan shall be based on the draft Desert Tortoise Relocation/Translocation Plan prepared by the Applicant (AECOM 2010a, DR-BIO-55) and shall include all revisions deemed necessary by BLM, USFWS, CDFG and the Energy Commission staff.

Verification: At least 30 days prior to site mobilization, the Project owner shall provide the CPM with the final version of a Plan that has been reviewed and approved by the CPM in consultation with BLM, USFWS and CDFG. All modifications to the approved Plan shall be made only after approval by the CPM, in consultation with BLM, USFWS and CDFG.

Within 30 days after initiation of relocation and/or translocation activities, the Designated Biologist shall provide to the CPM for review and approval, a written report identifying which items of the Plan have been completed, and a summary of all modifications to measures made during implementation of the Plan.

DESERT TORTOISE COMPLIANCE VERIFICATION

BIO-11 The Project owner shall provide Energy Commission, BLM, CDFG and USFWS staff with reasonable access to the Project site and compensation lands under the control of the Project owner and shall otherwise fully cooperate with the Energy Commission's and BLM's efforts to verify the Project owner's compliance with, or the effectiveness of, mitigation measures set forth in the conditions of certification. The Designated Biologist shall do all of the following:

1. Notification. Notify the CPM at least 14 calendar days before initiating construction-related ground disturbance activities; immediately notify the CPM in writing if the Project owner is not in compliance with any conditions of certification, including but not limited to any actual or anticipated failure to implement mitigation measures within the time periods specified in the conditions of certification;
2. Monitoring During Grubbing and Grading. Remain onsite daily while vegetation salvage, grubbing, grading and other ground-disturbance construction activities are taking place to avoid or minimize take of listed species, and verify personally or use Biological Monitors to check for compliance with all impact avoidance and minimization measures, including checking all exclusion zones to ensure that signs, stakes, and fencing are intact and that human activities are restricted in these protective zones.

3. Monthly Compliance Inspections. Conduct compliance inspections at a minimum of once per month after clearing, grubbing, and grading are completed and submit a monthly compliance report to the CPM, BLM, USFWS and CDFG during construction

4. Notification of Injured or Dead Listed Species. If an injured or dead listed species is detected within or near the Project Disturbance Area the CPM, BLM, the Ontario Office of CDFG, and the Carlsbad Office of USFWS shall be notified immediately by phone. Notification shall occur no later than noon on the business day following the event if it occurs outside normal business hours so that the agencies can determine if further actions are required to protect listed species. Written follow-up notification via FAX or electronic communication shall be submitted to these agencies within two calendar days of the incident and include the following information as relevant:

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

    b. Desert Tortoise Fatality. If a desert tortoise is killed by Project-related activities during construction or operation, a written report with the same information as an injury report shall be submitted to the CPM, BLM, the Ontario Office of CDFG, and the Carlsbad Office of USFWS. These desert tortoises shall be salvaged according to guidelines described in *Salvaging Injured, Recently Dead, Ill, and Dying Wild, Free-Roaming Desert Tortoise* (Berry 2001). The Project owner shall pay to have the desert tortoises transported and necropsied. The report shall include the date and time of the finding or incident.

5. Final Listed Species Report. The Designated Biologist shall provide the CPM and BLM a Final Listed Species Mitigation Report that includes, at a minimum: 1) a copy of the table in the BRMIMP with notes showing when each of the mitigation measures was implemented; 2) all available information about Project-related incidental take of listed species; 3) information about other Project impacts on the listed species; 4) construction dates; 5) an assessment of the effectiveness of conditions of certification in minimizing and compensating for Project impacts; 6) recommendations on how mitigation measures might be changed to more effectively minimize and mitigate the impacts of future Projects on the listed species; and 7) any other pertinent information, including the level of take of the listed species associated with the Project.

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

Verification: No later than 2 days following the above required notification of a sighting, injury, kill, or relocation of a listed species, the Project owner shall deliver to the CPM, BLM, CDFG, and USFWS via FAX or electronic communication the written report from the Designated Biologist describing all reported incidents of injury, kill, or relocation of a listed species, identifying who was notified, and explaining when the incidents occurred. In the case of a sighting in an active construction area, the Project owner shall, at the same time, submit a map (e.g., using Geographic Information Systems) depicting both the limits of construction and sighting location to the CPM, BLM, CDFG and USFWS.

No later than 45 days after initiation of Project operation the Designated Biologist shall provide the CPM and BLM a Final Listed Species Mitigation Report.

Beginning with the first month after clearing, grubbing and grading are completed and continuing every month until construction is complete the Project owner shall submit a report describing the results of Monthly Compliance Inspections to the CPM, BLM, USFWS and CDFG.

DESERT TORTOISE COMPENSATORY MITIGATION

BIO-12 To fully mitigate for habitat loss and potential take of desert tortoise, the Project owner shall provide compensatory mitigation ~~at a 1:1 ratio for impacts to 3,537 acres of habitat, and at a 5:1 ratio for impacts critical habitat~~ per **BIO-29 – Table 2**, adjusted to reflect the final Project footprint. For purposes of this condition, the Project footprint means all lands disturbed in the construction and operation of the Palen Project, including all Project linears, as well as undeveloped areas inside the Project's boundaries that will no longer provide viable long-term habitat for the desert tortoise. To satisfy this condition, the Project owner shall acquire, protect and transfer 5 acres of desert tortoise habitat for every acre of habitat within critical habitat and within the final Project footprint, and 1 acre of desert tortoise habitat for every acre of habitat outside of critical habitat but within the final Project footprint, and provide associated funding for the acquired lands, as specified below. Condition **BIO-28** may provide the Project owner with another option for satisfying some or all of the requirements in this condition. In lieu of acquiring lands itself, the Project owner may satisfy the requirements of this condition by depositing funds into the Renewable Energy Action Team (REAT) Account established with the National Fish and Wildlife Foundation (NFWF), as provided below in section 3.i. of this condition.

The timing of the mitigation shall correspond with the timing of the site disturbance activities as stated in **BIO-29** (phasing). If compensation lands are acquired in fee title or in easement, the requirements for acquisition, initial improvement and long-term management of compensation lands include all of the following:

1. Selection Criteria for Compensation Lands. The compensation lands selected for acquisition in fee title or in easement shall:
    a. be within the Colorado Desert Recovery Unit, with potential to contribute to desert tortoise habitat connectivity and build linkages between desert tortoise designated critical habitat, known populations of desert tortoise, and/or other preserve lands;
    b. provide habitat for desert tortoise with capacity to regenerate naturally when disturbances are removed;
    c. be prioritized near larger blocks of lands that are either already protected or planned for protection, such as DWMAs within the Colorado Desert Recovery Unit (Chuckwalla DWMA as first priority, Chemehuevi DMWA as the second) or which could feasibly be protected long-term by a public resource agency or a non-governmental organization dedicated to habitat preservation;
    d. be connected to lands with desert tortoise habitat equal to or better quality than the Project Site, ideally with populations that are stable, recovering, or likely to recover;
    e. not have a history of intensive recreational use or other disturbance that does not have the capacity to regenerate naturally when disturbances are removed or might make habitat recovery and restoration infeasible;
    f. not be characterized by high densities of invasive species, either on or immediately adjacent to the parcels under consideration, that might jeopardize habitat recovery and restoration;
    g. not contain hazardous wastes that cannot be removed to the extent that the site could not provide suitable habitat; and
    h. have water and mineral rights included as part of the acquisition, unless the CPM, in consultation with CDFG, BLM and USFWS, agrees in writing to the acceptability of the land.
2. Review and Approval of Compensation Lands Prior to Acquisition. The Project owner shall submit a formal acquisition proposal to the CPM, CDFG, USFWS, and BLM describing the parcel(s) intended for purchase. This acquisition proposal shall discuss the suitability of the proposed parcel(s) as compensation lands for desert tortoise in relation to the criteria listed above. Approval from the CPM and CDFG, in consultation with BLM and the USFWS, shall be required for acquisition of all compensatory mitigation parcels.

3. Compensation Lands Acquisition Requirements. The Project owner shall comply with the following requirements relating to acquisition of the compensation lands after the CPM and CDFG, in consultation with BLM and the USFWS, have approved the proposed compensation lands:

   a. Preliminary Report. The Project owner, or approved third party, shall provide a recent preliminary title report, initial hazardous materials survey report, biological analysis, and other necessary or requested documents for the proposed compensation land to the CPM and CDFG. All documents conveying or conserving compensation lands and all conditions of title are subject to review and approval by the CPM and CDFG, in consultation with BLM and the USFWS. For conveyances to the State, approval may also be required from the California Department of General Services, the Fish and Game Commission and the Wildlife Conservation Board.

   b. Title/Conveyance. The Project owner shall transfer fee title to the compensation lands, a conservation easement over the lands, or both fee title and conservation easement as required by the CPM and CDFG. Transfer of either fee title or an approved conservation easement will usually be sufficient, but some situations, e.g., the donation of lands burdened by a conservation easement to BLM, will require that both types of transfers be completed. Any transfer of a conservation easement or fee title must be to CDFG, a non-profit organization qualified to hold title to and manage compensation lands (pursuant to California Government Code section 65965), or to BLM under terms approved by the CPM and CDFG. If an approved non-profit organization holds title to the compensation lands, a conservation easement shall be recorded in favor of CDFG in a form approved by CDFG. If an approved non-profit holds a conservation easement, CDFG shall be named a third party beneficiary.

   c. Initial Habitat Improvement Fund. The Project owner shall fund the initial protection and habitat improvement of the compensation lands. Alternatively, a non-profit organization may hold the habitat improvement funds if it is qualified to manage the compensation lands (pursuant to California Government Code section 65965) and if it meets the approval of CDFG and the CPM. If CDFG takes fee title to the compensation lands, the habitat improvement fund must be paid to CDFG or its designee.

   d. Property Analysis Record. Upon identification of the compensation lands, the Project owner shall conduct a Property Analysis Record (PAR) or PAR-like analysis to establish the appropriate long-term maintenance and management fee to fund the in-perpetuity management of the acquired mitigation lands.

   e. Long-term Maintenance and Management Fund. In accordance with **BIO-29** (phasing), the Project owner shall deposit in NFWF's REAT Account a ~~non-wasting~~ capital long-term maintenance and management fee in the amount determined through the Property

Analysis Record (PAR) or PAR-like analysis conducted for the compensation lands.

The CPM, in consultation with CDFG, may designate another non-profit organization to hold the long-term maintenance and management fee if the organization is qualified to manage the compensation lands in perpetuity. If CDFG takes fee title to the compensation lands, CDFG shall determine whether it will hold the long-term management fee in the special deposit fund, leave the money in the REAT Account, or designate another entity to manage the long-term maintenance and management fee for CDFG and with CDFG supervision.

f. Interest, Principal, and Pooling of Funds. The Project owner, the CPM and CDFG shall ensure that an agreement is in place with the long-term maintenance and management fee holder/manager to ensure the following conditions:

   i. Interest. Interest generated from the initial capital long-term maintenance and management fee shall be available for reinvestment into the principal and for the long-term operation, management, and protection of the approved compensation lands, including reasonable administrative overhead, biological monitoring, improvements to carrying capacity, law enforcement measures, and any other action approved by CDFG designed to protect or improve the habitat values of the compensation lands.

   ii. Withdrawal of Principal. The long-term maintenance and management fee principal shall not be drawn upon unless such withdrawal is deemed necessary by the CDFG or the approved third-party long-term maintenance and management fee manager to ensure the continued viability of the species on the compensation lands. If CDFG takes fee title to the compensation lands, monies received by CDFG pursuant to this provision shall be deposited in a special deposit fund established solely for the purpose to manage lands in perpetuity unless CDFG designates NFWF or another entity to manage the long-term maintenance and management fee for CDFG.

   iii. Pooling Long-Term Maintenance and Management Fee Funds. CDFG, or a CPM-and CDFG-approved non-profit organization qualified to hold long-term maintenance and management fees solely for the purpose to manage lands in perpetuity, may pool the endowment with other endowments for the operation, management, and protection of the compensation lands for local populations of desert tortoise. However, for reporting purposes, the long-term maintenance and management fee fund must be tracked and reported individually to the CDFG and CPM.

g. Other expenses. In addition to the costs listed above, the Project owner shall be responsible for all other costs related to acquisition of compensation lands and conservation easements, including but not

limited to title and document review costs, expenses incurred from other state agency reviews, and overhead related to providing compensation lands to CDFG or an approved third party; escrow fees or costs; environmental contaminants clearance; and other site cleanup measures.

h. Mitigation Security. The Project owner shall provide financial assurances in accordance with **BIO-29** (phasing) to the CPM and CDFG with copies of the document(s) to BLM and the USFWS, to guarantee that an adequate level of funding is available to implement the mitigation measures described in this condition. These funds shall be used solely for implementation of the measures associated with the Project in the event the Project owner fails to comply with the requirements specified in this condition, or shall be returned to the Project owner upon successful compliance with the requirements in this condition. The CPM's or CDFG's use of the security to implement measures in this condition may not fully satisfy the Project owner's obligations under this condition. Financial assurance can be provided to the CPM and CDFG in the form of an irrevocable letter of credit, a pledged savings account or another form of security ("Security"). Prior to submitting the Security to the CPM, the Project owner shall obtain the CPM's approval in consultation with CDFG. BLM and the USFWS, of the form of the Security. Security shall be provided as described in **BIO-29 – Table 3** and the beginning of the Conditions of Certification subsection. The actual costs to comply with this condition will vary depending on the final footprint of the Project and its two phases, and the actual costs of acquiring, improving and managing the compensation lands.

   i. NFWF REAT Account. The Project owner may elect to fund the acquisition and initial improvement of compensation lands through NFWF by depositing funds for that purpose into NFWF's REAT Account. Initial deposits for this purpose must be made in the same amounts as the security required in section 3.h., above, and may be provided in lieu of security. If this option is used for the acquisition and initial improvement, the Project owner shall make an additional deposit into the REAT Account if necessary to cover the actual acquisition costs and administrative costs and fees of the compensation land purchase once land is identified and the actual costs are known. If the actual costs for acquisition and administrative costs and fees are less than described in **Biological ResourcesTable 6b**, the excess money deposited in the REAT Account shall be returned to the Project owner. Money deposited for the initial protection and improvement of the compensation lands shall not be returned to the Project owner.

      The responsibility for acquisition of compensation lands may be delegated to a third party other than NFWF, such as a non-governmental organization supportive of desert habitat conservation, by written agreement of the Energy Commission and

CDFG. Such delegation shall be subject to approval by the CPM and CDFG, in consultation with BLM and USFWS, prior to land acquisition, initial protection or maintenance and management activities. Agreements to delegate land acquisition to an approved third party, or to manage compensation lands, shall be implemented with 18 months of the Energy Commission's approval.

Verification: If the mitigation actions required under this condition are not completed prior to the start of ground-disturbing activities, the Project owner shall provide the CPM and CDFG with an approved form of Security in accordance with this condition of certification no later than 30 days prior to beginning Project ground-disturbing activities. Actual Security shall be provided no later than 7 days prior to the beginning of Project ground-disturbing activities. If Security is provided, the Project owner, or an approved third party, shall complete and provide written verification to the CPM, CDFG, BLM and USFWS of the compensation lands acquisition and transfer within 18 months of the start of Project ground-disturbing activities.

The Project owner may elect to fund the acquisition and initial improvement of compensation lands through NFWF or other approved third party by depositing funds for that purpose into NFWF's REAT Account. Initial deposits for this purpose must be made in the same amounts as the Security required in section 3.h. of this condition. Payment of the initial funds for acquisition and initial improvement must be made at least 30 days prior to the start of ground-disturbing activities.

No fewer than 90 days prior to acquisition of the property, the Project owner shall submit a formal acquisition proposal to the CPM, CDFG, USFWS, and BLM describing the parcels intended for purchase and shall obtain approval from the CPM and CDFG prior to the acquisition.

No fewer than 30 days after acquisition of the property the Project owner shall deposit the funds required by Section 3e above (long term management and maintenance fee) and provide proof of the deposit to the CPM.

The Project owner, or an approved third party, shall provide the CPM, CDFG, BLM, and USFWS with a management plan for the compensation lands within180 days of the land or easement purchase, as determined by the date on the title. The CPM shall review and approve the management plan for the compensatory mitigation lands, in consultation with CDFG, BLM and the USFWS.

Within 90 days after completion of all project related ground disturbance, the Project owner shall provide to the CPM, CDFG, BLM and USFWS an analysis, based on aerial photography, with the final accounting of the amount of habitat disturbed during Project construction. This shall be the basis for the final number of acres required to be acquired.

RAVEN MANAGEMENT PLAN AND FEE

BIO-13 The Project owner shall implement a Raven Monitoring, Management, and Control Plan (Raven Plan) that is consistent with the most current USFWS-approved raven management guidelines, and which meets the approval of the

CMP, in consultation with USFWS and CDFG. The draft Common Raven Monitoring, Management, and Control Plan submitted by the Applicant (AECOM 2010a, Attachment DR-BIO-57) shall provide the basis for the final Raven Plan, subject to review, revisions and approval from the CPM, CDFG and USFWS. The Raven Plan shall include but not be limited to a program to monitor raven presence in the Project vicinity, determine if raven numbers are increasing, and to implement raven control measures as needed based on that monitoring. The purpose of the plan is to avoid any Project-related increases in raven numbers during construction, operation, and decommissioning. In addition, the Project owner shall also provide funding for implementation of the USFWS Regional Raven Management Program, as described below.

1. The Raven Plan shall:
    a. Identify conditions associated with the Project that might provide raven subsidies or attractants;
    b. Describe management practices to avoid or minimize conditions that might increase raven numbers and predatory activities;
    c. Describe control practices for ravens;
    d. Establish thresholds that would trigger implementation of control practices;
    e. Address monitoring and nest removal during construction and for the life of the Project, and;
    f. Discuss reporting requirements.
2. USFWS Regional Raven Management Program. The Project owner shall submit payment to the project sub-account of the REAT Account held by the National Fish and Wildlife Foundation (NFWF) to support the USFWS Regional Raven Management Program. The one-time fee shall be as described by the USFWS in the *Renewable Energy Development and Common Raven Predation on the Desert Tortoise – Summary, dated May 2010* (USFWS 2010a) and the Cost Allocation Methodology for Implementation of the Regional Raven Management Plan, dated July 9, 2010) or more current guidance as provided by USFWS or CDFG (USFWS 2010b).

Verification: No less than 10 days prior to the start of any Project-related ground disturbance activities, the Project owner shall provide the CPM, USFWS, and CDFG with the final version of a Raven Plan. ~~The CPM would determine the plan's acceptability within 15 days of receipt of the final plan.~~ All modifications to the approved Raven Plan shall be made only with approval of the CPM in consultation with USFWS and CDFG.

No less than 10 days prior to the start of any Project-related ground disturbance activities for each phase of Project construction as described in **BIO-29**, the Project owner shall provide documentation to the CPM, CDFG and USFWS that the one-time fee for the USFWS Regional Raven Management Program of has been deposited to the

REAT-NFWS subaccount for the Project. Payment of the fees may be phased as described in **BIO-29 – Table 3**.

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

As part of the annual compliance report, each year following construction the Designated Biologist shall provide a report to the CPM that includes: a summary of the results of raven management and control activities for the year; a discussion of whether raven control and management goals for the year were met; and recommendations for raven management activities for the upcoming year.

WEED MANAGEMENT PLAN

BIO-14 The Project owner shall implement a Weed Management Plan (Plan) that meets the approval of the CPM. The objective of the Plan shall be to prevent the introduction of any new weeds and the spread of existing weeds as a result of Project construction, operation, and decomissioning. The Draft Weed Management Plan, submitted by the Applicant (AECOM 2010a, Attachment DR-BIO-100), shall provide the basis for the final Plan, subject to review and revisions from the CPM. The Plan shall include the following:

1. **Weed Plan Requirements**. ~~The final Plan shall~~ The Project owner shall provide a map to the CPM indicating the location of the Weed Management Area, which shall include all areas within 100 feet of the Project Disturbance Area, access roads, staging and laydown sites, and all other areas subject to temporary disturbance. The Project owner shall provide a Plan for the Weed Management Area includes at a minimum the following information: specific weed management objectives and measures for each target non-native weed species; baseline conditions; a map of the Weed Management Areas; map of existing populations of target weeds within 100 feet of the Project Disturbance Area and access roads; weed risk assessment; measures to prevent the introduction and spread of weeds; measures to minimize the risk of unintended harm to wildlife and other plants from weed control activities; monitoring and surveying methods; and reporting requirements. Weed control described in the Plan shall focus on prevention, early detection of new infestations, and early eradication for the life of the Project. Weed control along the Project linears shall be limited to the areas where soils were disturbed during construction. Weed monitoring shall occur a minimum of once per year during the early spring months (March-April) to detect seedlings before they set seed. The focus of the Plan shall be on avoiding the introduction of new invasive weeds or the spread of highly invasive species, such as Sahara mustard. Non-native species with low ecological risk, or that are very widespread, such as Mediterranean grass, shall be

noted but control shall not be required. When detected, infestations of high priority species shall be eradicated immediately.

2. **Avoidance and Treatment of Dense Weed Populations**. The Plan shall include a requirement to flag and avoid dense populations of the most invasive non-native weeds during any Project-related construction operation in or adjacent to infestations. If these areas cannot be avoided, they shall be pre-treated by one of the following methods: a) treating the infested areas in the season prior to construction by removing and properly disposing of seed heads by hand, prior to maturity, or spraying the new crop of plants that emerge in early spring, the season prior to construction, to reduce the viable seed contained in the soil, or b) removing and disposing the upper 2 inches of soil and disposing it offsite at a sanitary landfill or other site approved by the County Agricultural Commissioner , or burying the infested soil, e.g., under the solar facility or in a pit, and covering the infested soil with at least three feet of uncontaminated soil.
3. **Cleaning Vehicles and Equipment**. The Plan shall include specifications and requirements for the cleaning and removal of weed seed and weed plant parts from vehicles and equipment involved in Project-related construction and operation. Vehicles and equipment working in weed-infested areas (including previous job sites) shall be required to clean the equipment tires, tracks, and undercarriage *before* entering the Project area and before moving to infested areas of the Project Disturbance Area to uninfested areas. Cleaning shall be conducted on all track and bucket/blade components to adequately remove all visible dirt and plant debris. Cleaning using hand tools, such as brushes, brooms, rakes, or shovels, is preferred. If water must be used, the water/slurry shall be contained to prevent seeds and plant parts from washing into adjacent habitat.
4. **Safe Use of Herbicides**. The final Plan shall include detailed specifications for avoiding herbicide and soil stabilizer drift, and shall include a list of herbicides and soil stabilizers that will be used on the Project with manufacturer's guidance on appropriate use. The Plan shall indicate where the herbicides will be used, and what techniques will be used to avoid chemical drift or residual toxicity to special-status species and their pollinators, and consistent with the Nature Conservancy guidelines and the criteria under #2, below. Only weed control measures for target weeds with a demonstrated record of success shall be used, based on the best available information from sources such as The Nature Conservancy's The Global Invasive Species Team, California Invasive Plant Council: http://www.cal-ipc.org/ip/management/plant_profiles/index.php, and the California Department of Food & Agriculture Encycloweedia: http://www.cdfa.ca.gov/phpps/ipc/encycloweedia/encycloweedia_h p.htm.
5. The methods for weed control described in the final Plan shall meet the following criteria:

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

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

c. Biological: Biological methods may be used subject to review and approval by CDFG and USFWS and only if approved for such use by CDFA, and are either locally native species or have no demonstrated threat of naturalizing or hybridizing with native species;

d. Mechanical: Disking, tilling, and mechanical mowers or other heavy equipment shall not be employed in natural areas but hand weed trimmers (electric or gas-powered) may be used. Mechanical trimmers shall not be used during periods of high fire risk and shall only be used with implementation of fire prevention measures.

Verification: No less than 10 days prior to start of any Project-related ground disturbance activities, the Project owner shall provide the CPM with the final version of a Weed Management Plan that has been reviewed by BLM and Energy Commission staff. Modifications to the approved Weed Control Plan shall be made only with approval from the CPM in consultation with BLM.

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

As part of the Annual Compliance Report, each year following construction the Designated Biologist shall provide a report to the CPM and BLM that includes: a summary of the results of noxious weeds surveys and management activities for the year; a discussion of whether weed management goals for the year were met; and recommendations for weed management activities for the upcoming year.

PRE-CONSTRUCTION NEST SURVEYS AND AVOIDANCE MEASURES

BIO-15 Pre-construction nest surveys shall be conducted if construction activities would occur from February 1 through July 31. The Designated Biologist or Biological Monitor conducting the surveys shall be experienced bird surveyors familiar with standard nest-locating techniques such as those described in

Martin and Guepel (1993). The goal of the nesting surveys shall be to identify the general location of the nest sites, sufficient to establish a protective buffer zone around the potential nest site, and need not include identification of the precise nest locations. Surveyors performing nest surveys shall not concurrently be conducting desert tortoise surveys. The bird surveyors shall perform surveys in accordance with the following guidelines:

1. Surveys shall cover all potential nesting habitat in areas that could be disturbed by each phase of construction, as described in **BIO-29** (Phasing). Surveys shall also include areas within 500 feet of the boundaries of the active construction areas (including linear facilities);
2. At least two pre-construction surveys shall be conducted, separated by a minimum 10-day interval. One of the surveys shall be conducted within the 14-day period preceding initiation of construction activity. Additional follow-up surveys may be required if periods of construction inactivity exceed three weeks, an interval during which birds may establish a nesting territory and initiate egg laying and incubation;
3. If active nests or suspected active nests are detected during the survey, a buffer zone (protected area surrounding the nest, the size of which is to be determined by the Designated Biologist in consultation with CDFG) and monitoring plan shall be developed. Nest locations shall be mapped and submitted, along with a report stating the survey results, to the CPM; and
4. The Designated Biologist or Biological Monitor shall monitor the nest until he or she determines that nestlings have fledged and dispersed; activities that might, in the opinion of the Designated Biologist, disturb nesting activities, shall be prohibited within the buffer zone until such a determination is made.

Verification: At least 10 days prior to the start of any Project-related ground disturbance activities during the nesting season, the Project owner shall provide the CPM a letter-report describing the findings of the pre-construction nest surveys, including the time, date, and duration of the survey; identity and qualifications of the surveyor (s); and a list of species observed. If active or suspected active nests are detected during the survey, the report shall include a map or aerial photo identifying the location or suspected location of the nest and shall depict the boundaries of the no-disturbance buffer zone around the nest(s) that would be avoided during Project construction.

Each year during construction as part of the annual compliance report a follow-up report shall be provided to the CPM, BLM, CDFG, and USFWS describing the success of the buffer zones in preventing disturbance to nesting activity and a brief description of the outcome of the nesting effort (for example, whether young were successfully fledged from the nest or if the nest failed).

AVIAN PROTECTION PLAN

BIO-16 The Project owner shall prepare and implement an Avian Protection Plan to monitor the death and injury of birds from collisions with facility features such as transmission lines, reflective mirror-like surfaces and from heat, and bright

light from concentrating sunlight. The monitoring data shall be used to inform an adaptive management program that would avoid and minimize Project-related avian impacts. The study design shall be approved by the CPM in consultation with BLM, CDFG and USFWS, and shall be consistent with guidance from the USFWS on development of avian and bat protection plans (USFWS 2010c). The monitoring and adaptive management measures described in the Avian Protection Plan shall be incorporated into the Project's BRMIMP and implemented. The Avian Protection Plan shall include detailed specifications on data and carcass collection protocol and a rationale justifying the proposed schedule of carcass searches. The plan shall also include seasonal trials to assess bias from carcass removal by scavengers as well as searcher bias.

Verification: At least 30 days prior to the start of commercial operation of any of the power plant units the Project owner shall submit to the CPM, USFWS, and CDFG a final Avian Protection Plan. Modifications to the Avian Protection Plan shall be made only after approval from the CPM.

For one year following the beginning of power plant operation the Designated Biologist shall submit quarterly reports to the CPM, BLM, CDFG, and USFWS describing the dates, durations, and results of monitoring. The quarterly reports shall provide a detailed description of any Project-related bird deaths or injuries detected during the monitoring study or at any other time, and describe adaptive management measures implemented to avoid or minimize deaths or injuries. Following the completion of the fourth quarter of monitoring the Designated Biologist shall prepare an Annual Report that summarizes the year's data, analyzes any Project-related bird fatalities or injuries detected, and provides recommendations for future monitoring and any adaptive management actions needed.

The Annual Report shall be provided to the CPM, BLM, CDFG, and USFWS. Quarterly reporting shall continue until the CPM, in consultation with CDFG and USFWS determine whether more years of monitoring are needed, and whether mitigation and adaptive management measures are necessary.

AMERICAN BADGER AND DESERT KIT FOX IMPACT AVOIDANCE AND MINIMIZATION MEASURES

BIO-17 To avoid direct impacts to American badgers and desert kit fox, pre-construction surveys shall be conducted for these species concurrent with the desert tortoise surveys to facilitate passive relocation. Surveys shall be conducted as described below:

1. Biological Monitors shall perform pre-construction surveys for badger and kit fox dens in the Project disturbance area and a 20-foot buffer beyond the Project disturbance area, including utility corridors and access roads. If dens are detected each den shall be classified as inactive, potentially active, or definitely active. Surveys may be concurrent with desert tortoise surveys.

2. Inactive dens that would be directly impacted by construction activities shall be excavated by hand and backfilled to prevent reuse by badgers or kit fox.
3. Potentially and definitely active dens that would be directly impacted by construction activities shall be monitored by the Biological Monitor for three consecutive nights using a tracking medium (such as diatomaceous earth or fire clay) and/or infrared camera stations at the entrance.
4. If no tracks are observed in the tracking medium or no photos of the target species are captured after three nights, the den shall be excavated and backfilled by hand.
5. If tracks are observed, the den shall be progressively blocked with natural materials (rocks, dirt, sticks, and vegetation piled in front of the entrance) for the next three to five nights to discourage the badger or kit fox from continued use. After verification that the den is unoccupied it shall then be excavated and backfilled by hand to ensure that no badgers or kit fox are trapped in the den. BLM approval may be required prior to release of badgers on public lands.

Verification: The Project owner shall submit a report to the CPM, BLM and CDFG within 30 days of completion of badger and kit fox surveys. The report shall describe survey methods, results, impact avoidance and minimization measures implemented, and the results of those measures.

BURROWING OWL IMPACT AVOIDANCE, MINIMIZATION, AND COMPENSATION MEASURES

BIO-18 The Project owner shall implement the following measures to avoid, minimize and offset impacts to burrowing owls:

1. Pre-Construction Surveys. The Designated Biologist or Biological Monitor shall conduct pre-construction surveys for burrowing owls no more than 30 days prior to initiation of construction activities. Surveys shall be focused exclusively on detecting burrowing owls, and shall be conducted from two hours before sunset to 1 hour after or from 1 hour before to 2 hours after sunrise. The survey area shall include the Project Disturbance Area and surrounding 500 foot survey buffer for each phase of construction in accordance with **BIO-29** (phasing).
2. Implement Burrowing Owl Mitigation Plan. The Project owner shall implement measures described in the final Burrowing Owl Mitigation Plan. The final Burrowing Owl Mitigation Plan shall be approved by the CPM, in consultation with BLM, USFWS and CDFG, and shall:
    a. identify suitable sites within 1 mile of the Project Disturbance Areas for creation or enhancement of burrows prior to passive relocation efforts;
    b. provide guidelines for creation or enhancement of at least two natural or artificial burrows per relocated owl;
    c. provide detailed methods and guidance for passive relocation of burrowing owls occurring within the Project Disturbance Area; and

d. describe monitoring and management of the passive relocation effort, including the created or enhanced burrow location and the project area where burrowing owls were relocated from, and provide a reporting plan.

3. Implement Avoidance Measures. If an active burrowing owl burrow is detected within 500 feet from the Project Disturbance Area the following avoidance and minimization measures shall be implemented:

   a. Establish Non-Disturbance Buffer. Fencing shall be installed at a 250-foot radius from the occupied burrow to create a non-disturbance buffer around the burrow. The non-disturbance buffer and fence line may be reduced to 160 feet if all Project-related activities that might disturb burrowing owls would be conducted during the non-breeding season (September 1st through January 31st). Signs shall be posted in English and Spanish at the fence line indicating no entry or disturbance is permitted within the fenced buffer.

   b. Monitoring: If construction activities would occur within 500 feet of the occupied burrow during the nesting season (February 1 – August 31st) the Designated Biologist or Biological Monitor shall monitor to determine if these activities have potential to adversely affect nesting efforts, and shall make recommendations to minimize or avoid such disturbance.

4. Acquire 78 Acres of Burrowing Owl Habitat. The Project owner shall acquire, in fee or in easement 78 acres of land suitable to support a resident population of burrowing owls and shall provide funding for the enhancement and long-term management of these compensation lands. The responsibilities for acquisition and management of the compensation lands may be delegated by written agreement to CDFG or to a third party, such as a non-governmental organization dedicated to habitat conservation, subject to approval by the CPM, in consultation with CDFG and USFWS prior to land acquisition or management activities. Additional funds shall be based on the adjusted market value of compensation lands at the time of construction to acquire and manage habitat.

   a. Criteria for Burrowing Owl Mitigation Lands. The terms and conditions of this acquisition or easement shall be as described in **BIO-12** [Desert Tortoise Compensatory Mitigation], with the additional criteria to include: 1) ~~the 78 acres of~~ mitigation land per **BIO-29 - Table 2** that must provide suitable habitat for burrowing owls, and 2) the acquisition lands must either currently support burrowing owls or be no farther than 5 miles from an active burrowing owl nesting territory. The 78 acres of burrowing owl mitigation lands may be included with the desert tortoise mitigation lands ONLY if these two burrowing owl criteria are met. If the 78 acres of burrowing owl mitigation land is separate from the acreage required for desert tortoise compensation lands, the Project owner shall fulfill the requirements described below in this condition.

b. Security. If the 78 acres of burrowing owl mitigation land is separate from the acreage required for desert tortoise compensation lands the Project owner or an approved third party shall complete acquisition of the proposed compensation lands within the time period specified for this acquisition (see the verification section at the end of this condition). Alternatively, financial assurance can be provided by the Project owner to the CPM and CDFG, according to the measures outlined in **BIO-12**. The amount of the Security shall be as described in **BIO-29 – Table 3** for the proposed Project or any of the Project alternatives. These funds shall be used solely for implementation of the measures associated with the Project. Financial assurance can be provided to the CPM in the form of an irrevocable letter of credit, a pledged savings account or another form of security ("Security") prior to initiating ground-disturbing Project activities. Prior to submittal to the CPM, the Security shall be approved by the CPM, in consultation with CDFG and the USFWS to ensure funding. The final amount due will be determined by an updated appraisal and PAR analysis conducted as described in **BIO-12**.

Verification: If pre-construction surveys detect burrowing owls within the Project Disturbance Area and relocation of the owls is required, within 30 days of completion of the burrowing owl pre-construction surveys the Project owner shall submit to the CPM, BLM, CDFG, and USFWS a Burrowing Owl Mitigation Plan. The Burrowing Owl Mitigation Plan shall identify suitable areas for construction of burrows and the other passive relocation as described above. As part of the Annual Compliance Report each year following construction for a period of five years, the Designated Biologist shall provide a report to the CPM, BLM, USFWS and CDFG that describes the results of monitoring and management of the burrowing owl ~~relocation~~ burrow creation or enhancement area(s).

If pre-construction surveys detect burrowing owls within 500 feet of proposed construction activities, at least 10 days prior to the start of any Project-related site disturbance activities the Designated Biologist shall provide to the CPM, BLM, CDFG, and USFWS documentation indicating that non-disturbance buffer fencing has been installed as described above. The Project owner shall report monthly to the CPM, BLM, CDFG and USFWS for the duration of construction on the implementation of burrowing owl avoidance and minimization measures. Within 30 days after completion of construction the Project owner shall provide to the CPM and CDFG a written report identifying how mitigation measures described in the plan have been completed.

No less than 30 days prior to the start of Project ground-disturbing activities the Project owner shall provide the CPM with an approved form of Security in accordance with this condition of certification. Actual Security for acquisition of 78 acres of burrowing owl habitat shall be provided no later than 7 days prior to the beginning of Project ground-disturbing activities.

No fewer than 90 days prior to the land or easement purchase, as determined by the date on the title, the Project owner shall provide the CPM with a management plan for

review and approval, in consultation with CDFG, BLM, and USFWS, for the compensation lands and associated funds.

No later than 18 months from initiation of construction, the Project owner shall provide written verification to the CPM that the compensation lands or conservation easements have been acquired and recorded in favor of the approved recipient.

SPECIAL-STATUS PLANT IMPACT AVOIDANCE, MINIMIZATION AND COMPENSATION

BIO-19 This condition contains the following four sections:

- **Section A: Special-Status Plant Impact Avoidance and Minimization Measures** contains the Best Management Practices and other measures designed to avoid accidental indirect impacts to plants during construction, operation, and closure. The measures are required for special-status plants located outside of the Project Disturbance Area and within 100 feet of the Project Disturbance Area. The same measures shall also be implemented for plants within the Project Disturbance Area that are avoided pursuant to Section C of this condition.
- **Section B: Conduct Late Season Botanical Surveys** describes guidelines for conducting summer-fall 2010 surveys to detect special-status plants that would have been missed during the spring 2010 surveys.
- **Section C: Avoidance Requirements for Special-Status Plants** Detected **in the Summer/Fall 2010 Surveys** outlines the level of on-site avoidance required for any special-status plants detected during the summer-fall surveys, and specifies when off-site mitigation is required..
- **Section D: Off-Site Compensatory Mitigation for Special-Status Plants** describes performance standards for off-site mitigation through acquisition or restoration/enhancement.

"Project Disturbance Area" encompasses all areas to be temporarily and permanently disturbed by the Project, including the plant site, linear facilities, and areas disturbed by temporary access roads, fence installation, construction work lay-down and staging areas, parking, storage, or by any other activities resulting in disturbance to soil or vegetation. The term "Permanent Project Disturbance Area" refers only to the solar facility; "linears" includes transmission lines, laydown areas, pipelines, and access roads.

The Project owner shall implement the following measures in Section A, B, C, and D to avoid, minimize, and compensate for direct, indirect, and cumulative impacts to special-status plant species:

Section A: Special-Status Plant Impact Avoidance and Minimization Measures

To protect all special-status plants[2][3]located outside of the Project Disturbance Area and within 100 feet of the permitted Project Disturbance Area from accidental and indirect impacts during construction, operation, and closure, the Project owner shall implement the following measures:

1. Designated Botanist. An experienced botanist who meets the qualifications described in Section **B-2** below shall oversee compliance with all special-status plant avoidance, minimization, and compensation measures described in this condition throughout construction and closure. The Designated Botanist shall oversee and train all other Biological Monitors tasked with conducting botanical survey and monitoring work. During operation of the Project, the Designated Biologist shall be responsible for protecting special-status plant occurrences within 100 feet of the Project boundaries.

2. Special-Status Plant Impact Avoidance and Minimization Measures. The Project owner shall incorporate all measures for protecting special-status plants in close proximity to the site into the BRMIMP (**BIO-7**). These measures shall include the following elements:

    a. Site Design Modifications: i) Incorporate s modifications to site design or construction techniques to minimize direct and indirect impacts to special-status plants along the Project linears to include: limiting the width of the work area; adjusting the location of staging areas, lay downs, spur roads and poles or towers; driving and crushing vegetation as an alternative to blading temporary roads to preserve the seed bank, and minor adjustments to the alignment of the roads and pipelines within the constraints of the ROW; ii)modify diffusers on engineered channel to ensure discharge into existing small channels that were deprived of flows from diversion into engineered channel to minimize impacts downstream and maintain the natural surface drainage patterns and sediment transport critical to wash-dependent special-status plants; iii) These modifications shall be clearly depicted on the grading and construction plans, and on report-sized maps in the BRMIMP.

    b. Establish Environmentally Sensitive Areas (ESAs). Prior to the start of any ground- or vegetation-disturbing activities, the Designated Botanist shall establish ESAs to protect avoided[4] special-status plants located outside of the Project Disturbance Areas and within 100 feet of the

[2] This shall include special-status plants found during the fall 2010 surveys and the following species found during the spring 2009-2010 surveys: Harwood's milk-vetch; Harwood's woolly-star; California ditaxis; ribbed cryptantha, and the "Palen Lake atriplex (Andre sp. nov.).

[3] Staff defines special-status plants as described in *Protocols for Surveying and Evaluating Impacts to Special-Status Native Plant Populations and Natural Communities* (California Natural Resources Agency, Department of Fish and Game, issued November 24, 2009). "List 3 plants may be analyzed under CEQA §15380 if sufficient information is available to assess potential impacts to such plants. Factors such as regional rarity vs. statewide rarity should be considered in determining whether cumulative impacts to a List 4 plant are significant even if individual project impacts are not."

[4] "Avoided" includes plants occurring within 100 feet outside of the Project boundary, and all plants within the Project Disturbance Area (linears or solar facility) that were avoided pursuant to Section C of this condition.

boundary of construction. This includes plant occurrences identified during the spring 2009-2010 surveys and the late season 2010 surveys. The locations of ESAs shall be clearly depicted on construction drawings, which shall also include all avoidance and minimization measures on the margins of the construction plans. The boundaries of the ESAs shall be placed a minimum of 20 feet from the uphill side of the occurrence and 10 feet from the downhill side. Where this is not possible due to construction constraints, other protection measures such as silt-fencing and sediment controls may be employed to protect the occurrences. Equipment and vehicle maintenance areas, and wash areas, shall be located 100 feet from the uphill side of any ESAs. ESAs shall be clearly delineated in the field with temporary construction fencing and signs prohibiting movement of the fencing or sediment controls under penalty of work stoppages and additional compensatory mitigation. ESAs shall also be clearly identified (with signage or by mapping on site plans) to ensure that avoided plants are not inadvertently harmed during construction, operation, or closure.

c. Special-Status Plant Worker Environmental Awareness Program (WEAP). The WEAP **(BIO-6)** shall include training components specific to protection of special-status plants as outlined in this condition.

d. Herbicide and Soil Stabilizer Drift Control Measures. Special-status plant occurrences within 100 feet of the Project Disturbance Area, and any occurrences avoided within the Project Disturbance Area[3] shall be protected from herbicide and soil stabilizer drift. The Weed Control Program (**BIO-14**) shall include measures to avoid chemical drift or residual toxicity to special-status plants consistent with guidelines such as those provided by the Nature Conservancy's *The Global Invasive Species Team*[5] , the U.S. Environmental Protection Agency, and the Pesticide Action Network Database[6].

e. Erosion and Sediment Control Measures. Erosion and sediment control measures shall not inadvertently impact special-status plants by using invasive or non-native plants in seed mixes, introducing pest plants through contaminated seed or straw, accidental burial by mulches, etc.. These specifications shall be incorporated in the Drainage, Erosion, and Sedimentation Control Plan required under **SOIL&WATER-1**.

f. Locate Staging, Parking, Spoils, and Storage Areas Away from Special-Status Plant Occurrences. Areas for spoils, equipment, vehicles, and materials storage areas; parking; equipment and vehicle maintenance areas, and wash areas shall be placed at least 100 feet from any ESAs. These specifications shall be incorporated in the

[5] Hillmer, J. & D. Liedtke. 2003. Safe herbicide handling: a guide for land stewards and volunteer stewards. Ohio Chapter, The Nature Conservancy, Dublin, OH. 20 pp. Online: <http://www.invasive.org/gist/products.html.
[6] Pesticide Action Network of North America. Kegley, S.E., Hill, B.R., Orme S., Choi A.H., PAN Pesticide Database, Pesticide Action Network, North America. San Francisco, CA, 2010 <http://www.pesticideinfo.org>

Drainage, Erosion, and Sedimentation Control Plan required under **SOIL&WATER-1**.

g. Pre-Construction Seed Collection. For all significant impacts to special-status plants, mitigation shall include seed collection from the affected special-status plants population on-site prior to construction to conserve the germplasm and provide a seed source for restoration efforts. Seed collection shall follow the guidelines described in Section D.III.3 of this condition.

h. Monitoring and Reporting Requirements. The Designated Botanist, or BM under supervision of the Designated Botanist, shall conduct weekly monitoring of the ESAs that protect special-status plant occurrences during construction and decommissioning activities.

Section B: Conduct Late-Season Botanical Surveys

The Project owner shall conduct late-summer/fall botanical surveys for late-season special-status plants prior to start of construction or by the end of 2010, as described below:

1. Survey Timing. Surveys shall be timed to detect: a) summer annuals triggered to germinate by the warm, tropical summer storms (which may occur any time between June and October), and b) fall-blooming perennials that respond to the cooler, later season storms (typically beginning in September or October). For those species that are identified by vegetative characteristics, surveys do not have to be timed for blooming or fruiting. The surveys shall not be timed to coincide with the statistical peak bloom period of the target species but shall instead, if possible, be based on plant phenology and the timing of a significant storm event (e. g., a 10mm or greater rain or multiple storm events of sufficient volume to trigger germination as determined by a qualified botanist.). If possible, surveys shall occur at the appropriate time to capture the characteristics necessary to identify the taxon. Construction is authorized to commence following a 2010 late season survey.

2. Surveyor Qualifications and Training. Surveys shall be conducted by a qualified botanist knowledgeable in the complex biology of the local flora, and consistent with CDFG (2009) and BLM (2009) guidelines for surveyor qualifications. Each surveyor shall be equipped with a GPS unit and record a complete tracklog; these data shall be compiled and submitted along with the Summer-Fall Survey Botanical Report (described below). Prior to the start of surveys, all crew members shall, at a minimum, visit reference sites (where available) and/or review herbarium specimens of all BLM Sensitive plants, CNPS List 1B or 2 (Nature Serve rank S1 and S2) or proposed List 1B or 2 taxa, and any new reported or documented taxa, to obtain a search image. Because the potential for range extensions is unknown, the list of potentially occurring special-status plants shall include all special-status taxa known to occur within the Sonoran Desert region and the eastern portion of the Mojave in California. The list shall also include taxa with bloom seasons that begin in fall and extend into the early

spring as many of these are reported to be easier to detect in fall, following the start of the fall rains.

3. Survey Coverage. The survey coverage or intensity shall be in accordance with BLM Survey Protocols (issued July 2009)[7], which specify that intuitive controlled surveys shall only be accomplished by botanists familiar with the habitats and species that may reasonably be expected to occur in the project area.

4. Pre-Construction Seed Collection. For all significant impacts to special-status plants, mitigation shall include seed collection from the affected special-status plants population on-site prior to construction to conserve the germplasm and provide a seed source for restoration efforts. Seed collection shall be conducted during the late-season surveys follow the guidelines described in Section D.III.3 of this condition.

5. Documenting Occurrences. If a special-status plant is detected, the full extent of the population onsite shall be recorded using GPS in accordance with BLM survey protocols. Additionally, the extent of the population within one mile of Project boundaries shall be assessed at least qualitatively to facilitate an accurate estimation of the proportion of the population affected by the Project. For populations that are very dense or very large, the population size may be estimated by simple sampling techniques. When populations are very extensive or locally abundant, the surveyor must provide some basis for this assertion and roughly map the extent on a topographic map. All but the smallest populations (e.g., a population occupying less than 100 square feet) shall be recorded as area polygons; the smallest populations may be recorded as point features. All GPS-recorded occurrences shall include: the number of plants, phenology, observed threats (e.g., OHV or invasive exotics), and habitat or community type. The map of occurrences submitted with the final botanical report shall be prepared to ensure consistency with definition of an occurrence by CNDDB, i.e., occurrences found within 0.25 miles of another occurrence of the same taxon, and not separated by significant habitat discontinuities, shall be combined into a single 'occurrence'. The Project owner shall also submit the raw GPS shape files and metadata, and completed CNDDB forms for each 'occurrence' (as defined by CNDDB).

6. Reporting. Raw GPS data, metadata, and CNDDB field forms shall be provided to the CPM and the BLM State Botanist within two weeks of the completion of each survey. If surveys are split into two or more periods (e.g., a late summer survey and a fall survey), then a summary letter shall be submitted following each survey period.
   The Final Summer-Fall Botanical Survey Report shall be prepared consistent with CDFG guidelines (CDFG 2009), and BLM 2009 guidelines and shall include all of the following components:

[7] Bureau of Land Management (BLM), California State Office. *Survey Protocols Required for NEPA/ESA Compliance for BLM Special Status Plant Species*. Issued July 2009.

a. the BLM designation, NatureServe Global and State Rank of each species or taxon found (or proposed rank, or CNPS List);

b. the number or percent of the occurrence that will be directly affected, and indirectly affected by changes in drainage patterns or altered geomorphic processes;

c. the habitat or plant community that supports the occurrence and the total acres of that habitat or community type that occurs in the Project Disturbance Area;

d. an indication of whether the occurrence has any local or regional significance (e.g., if it exhibits any unusual morphology, occurs at the periphery of its range in California, represents a significant range extension or disjunct occurrence, or occurs in an atypical habitat or substrate);

e. a completed CNDDB field form for every occurrence (occurrences of the same species within one-quarter mile or less of each other combined as one occurrence, consistent with CNDDB methodology), and

f. two maps: one that depicts the raw GPS data (as collected in the field) on a topographic base map with Project features; and a second map that follows the CNDDB protocol for occurrence mapping.

Section C: Avoidance Requirements for Special-Status Plants Detected in the Summer/Fall 2010 Surveys

The Project owner shall apply the following avoidance and mitigation standards for impacts to late blooming special-status plants that might be detected during late summer/fall season surveys. The Project owner shall immediately notify the CDFG, USFWS, BLM State Botanist, and the CPM if any State- or Federal-listed species or BLM Sensitive species are detected. Avoidance and/or the off-site mitigation measures described in Section D below would reduce impacts to these special-status plant species to less-than-significant levels. Plants shall be considered impacted if they are within the Project footprint, or if they would be affected by Project-related hydrologic changes or changes to the local sand transport system Downstream/ downwind impacts from altered hydrology or geomorphic processes shall be considered direct impacts.

1. Mitigation for CNDDB Rank 1 Plants (Critically Imperiled). If late blooming species with a CNDDB rank of 1[8] are detected within the Project Disturbance Area, complete avoidance is mandatory along the linears and within construction laydown areas. The Project owner shall limit the width of the work area; adjusting the location of staging areas, lay downs, spur roads and poles or towers; driving and crushing vegetation as an

[8] The CNDDB Rank is provided in the California Natural Diversity Database (CNDDB). Plants with a Rank of 1 are "Critically imperiled in the nation or state/province because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the state."

alternative to blading temporary roads, and other construction or design modifications as necessary to achieve avoidance of any Rank 1 plants detected.

If late-season Rank 1 plants are detected on the solar facility, the Project owner shall avoid all plants around the perimeter[9] of the facility as necessary to achieve 75 percent avoidance of the local population of the affected species. The local population shall be measured by the number of individuals occurring on the Project Site and within the immediate watershed of the Project for wash dependent-species or species of unknown dispersal mechanism, or within the local sand transport corridor for wind dispersed species. Measurement of percent avoidance shall be based on population for perennials and on habitat for annuals (habitat containing the species' micro-habitat preferences, such as "fine silts and moist depressions"). Avoidance within the central portion of the solar facility is not recommended because it would create fragmented conditions that would not sustain persistence of the affected species. For all portions of the local population not avoided, the Project owner shall implement off-site mitigation at a ratio of 3:1. The off-site mitigation may include land acquisition or implementation of a restoration/enhancement program for the species, and shall meet the performance standards described in section D of this Condition. The Applicant must demonstrate, subject to review and approval by the CPM, that the impacts, after mitigation, will not cause a loss of viability[10] for that species. The Project owner shall prepare and implement a Special-Status Plant Mitigation Plan (Plan). The content of the Plan and definitions shall be as described above in subsection C.3, below.

2. Mitigation for CNDDB Rank 2[11] Plants (Imperiled). If late-season CNDDB Rank 2 species are detected within the Project Disturbance Area avoidance is mandatory along the linears and construction laydown areas. The Project owner shall limit the width of the work area, adjusting the location of staging areas, lay downs, spur roads and poles or towers; driving and crushing vegetation as an alternative to blading temporary roads, and other construction or design modifications as necessary to achieve avoidance of any Rank 2 plants detected[12].

[9] The inside "perimeter" is used here to describe the distance or length equal to two troughs.

[10] A "viable" species is one consisting of self-sustaining and interacting populations that are well-distributed throughout the species' range. "Self-sustaining populations" are those that are sufficiently abundant and have sufficient diversity to display the array of life history strategies and forms to provide for their long-term persistence and adaptability over time. The definition of the term "well-distributed" can vary based on current, historic, and potential population and habitat conditions. Maintaining viability is a means of ensuring, as much as possible, that a species will not go extinct in the foreseeable future. Because species and their environments are dynamic, there is not a single population size above which a species is viable and below which it will become extinct. Viability is best expressed as a level of risk of extinction.

[11] CNDDB Rank 2 plants are "Imperiled in the nation or state/province because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the state".

[12] The CNDDB Rank 2 plants California ditaxis was detected along the linears within the Project Disturbance Area (Solar Millenium 2010p). Staff concluded the impact was significant and all terms and conditions of Section C.2 shall be implemented. Staff concluded that the direct impacts to Harwood's milk-vetch were minor and no compensatory mitigation is required beyond the avoidance and minimization measures described in Section A of this condition.

If late-season Rank 2 plants are detected on the solar facility, the Project owner shall implement off-site mitigation, at a ratio of 2:1, for any impacts exceeding 25 percent of the local population. The off-site mitigation may include land acquisition or implementation of a restoration/enhancement program for the species, and shall meet the performance standards described in section D of this Condition. The Project owner must demonstrate, subject to review and approval by the CPM, that the impacts, after mitigation, will not cause a loss of viability for that species. The Project owner shall prepare and implement a Special-Status Plant Mitigation Plan (Plan). The content of the Plan and definitions shall be as described above in subsection C.3, below.

3. Mitigation for CNDDB Rank 3[13] Plants (Vulnerable). If CNDDB Rank 3 plants are detected (which constitutes most CNPS List 4 plants), mitigation is not required unless the occurrence has local or regional significance, in which case the plant occurrence shall be treated as a CNDDB Rank 2 plant; avoidance and mitigation would be as described above under C.2. A plant occurrence would be considered to have local or regional significance if:

   a. It occurs at the outermost periphery of its range in California;

   b. It occurs in an atypical habitat, region, or elevation for the taxon that suggests that the occurrence may have genetic significance (e.g., that may increase its ability to survive future threats), or;

   c. It exhibits any unusual morphology that is not clearly attributable to environmental factors that may indicate a potential new variety or sub-species.

4. Prepare Special-Status Plant Mitigation Plan. If the project will impact any CNDDB Rank 1 or Rank 2 plants, or Rank 3 plants of local or regional significance, or new taxa, the Project owner shall prepare and implement a Special-Status Plant Mitigation Plan (Plan). Compensatory mitigation, as described in Section D of this condition, and at a mitigation ratio of 3:1 for Rank 1 plants, and 2:1 for Rank 2 plants and Rank 1 plants of local or regional significance, and new taxa. The Plan shall include, at a minimum, the following components and definitions:

   a. A description of the occurrences of the affected special-status species, ecological characteristics such as soil, hydrology, and other micro-habitat requirements, ecosystem processes required for maintenance of the species or its habitat, reproduction and dispersal mechanisms, pollinators, local distribution, a description of the extent of the population off-site, the percentage of the local population affected, and a description of how these occurrences would be impacted by the Project, including direct and indirect effects. Occurrences shall be considered impacted if they are within the Project footprint, and if they

[13] CNDDB Rank 3 plants are "Vulnerable in the nation or state/province due to a restricted range, relatively few populations (often 80or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.

would be affected by Project-related hydrologic changes or changes to the local sand transport system.

b. A description of the avoidance and minimization measures that would achieve complete avoidance of occurrences on the Project linears and construction laydown areas. If avoidance is also required on the solar facility (Rank 1 species), provide a description of the measures that would be implemented to avoid or minimize impacts to occurrences on the solar facility. “Avoidance” shall include protection of the ecosystem processes essential for maintenance of the protected plant occurrence, and protection of the seed bank. Isolated ‘islands’ of protected plants disconnected by the Project from natural fluvial, aeolian (wind), or other processes essential for maintenance of the species, shall not be considered avoidance.

c. If off-site mitigation is also required, pursuant to C.1 –C.3 above, the Plan shall include a description of the proposed mitigation (acquisition or restoration/enhancement) and demonstrate how the mitigation will meet the performance standards described in Section D of this condition.
For CNDDB Rank 1 plants that cannot be avoided (i.e., plants located in the central portion of the solar facility), the Plan must demonstrate that the impacts (after mitigation) will not cause a loss of viability for that species. The assessment of viability shall include: *i*) current literature compilation and review on the affected species, it’s documented and reported occurrences, range and distribution, habitat, and the ecological conditions needed to support it; *ii)* consultation with scientists and others with expertise and local knowledge of the species to gather unpublished data and other information to supplement the literature review findings, and (if available) *iii*) information on species’ habitat relationships, demographics, genetics, and risk factors.

Section D: Off-Site Compensatory Mitigation for Special-Status Plants

Where compensatory mitigation is required under the terms of Section C, above, the Project owner shall mitigate Project impacts to special-status plant occurrences with compensatory mitigation. Compensatory mitigation shall consist of acquisition of habitat supporting the target species, or restoration/enhancement of populations of the target species, and shall meet the performance standards for mitigation described below. In the event that no opportunities for acquisition or restoration/enhancement exist, the Project owner can fund a species distribution study designed to promote the future preservation, protection or recovery of the species. Compensatory mitigation shall be at a ratio of 3:1 for Rank 1 plants, with three acres of habitat acquired or restored/enhanced for every acre of habitat occupied by the special status plant that will be disturbed by the Project Disturbance Area (for example if the area occupied by the special status plant collectively measured is ¼ acre than the compensatory mitigation will be ¾ of an acre). The mitigation ratio for

Rank 2 plants shall be 2:1. So, for the example above, the mitigation ratio would be one-half acre for the Rank 2 plants.

The Project owner shall provide funding for the acquisition and/or restoration/enhancement, initial improvement, and long-term maintenance and management of the acquired or restored lands. The actual costs to comply with this condition will vary depending on the Project Disturbance Area, the actual costs of acquiring compensation habitat, the actual costs of initially improving the habitat, the actual costs of long-term management as determined by a Property Analysis Record (PAR) report, and other transactional costs related to the use of compensatory mitigation.

The Project owner shall comply with other related requirements in this condition:

I. Compensatory Mitigation by Acquisition: The requirements for the acquisition, initial protection and habitat improvement, and long-term maintenance and management of special-status plant compensation lands include all of the following:

1. Selection Criteria for Acquisition Lands. The compensation lands selected for acquisition may include any of the following three categories:
    a. Occupied Habitat, No Habitat Threats. The compensation lands selected for acquisition shall be occupied by the target plant population and shall be characterized by site integrity and habitat quality that are required to support the target species, and shall be of equal or better habitat quality than that of the affected occurrence. The occurrence of the target special-status plant on the proposed acquisition lands should be viable, stable or increasing (in size and reproduction).
    b. Occupied Habitat, Habitat Threats. Occupied compensation lands characterized by habitat threats may also be acquired as long as the population could be reasonably expected to recover with habitat restoration efforts (e.g., OHV or grazing exclusion, or removal of invasive non-native plants) and is accompanied by a Habitat Enhancement/Restoration Plan as described in Section D.II, below.
    c. Unoccupied but Adjacent. The Project owner may also acquire habitat for which occupancy by the target species has not been documented, if the proposed acquisition lands are adjacent to occupied habitat. The Project owner shall provide evidence that acquisitions of such unoccupied lands would improve the defensibility and long-term sustainability of the occupied habitat by providing a protective buffer around the occurrence and by enhancing connectivity with undisturbed habitat. This acquisition may include habitat restoration efforts where appropriate, particularly when these restoration efforts will benefit adjacent habitat that is occupied by the target species.
2. Review and Approval of Compensation Lands Prior to Acquisition. The Project owner shall submit a formal acquisition proposal to the CPM

describing the parcel(s) intended for purchase. This acquisition proposal shall discuss the suitability of the proposed parcel(s) as compensation lands for special-status plants in relation to the criteria listed above, and must be approved by the CPM.

3. Management Plan. The Project owner or approved third party shall prepare a management plan for the compensation lands in consultation with the entity that will be managing the lands. The goal of the management plan shall be to support and enhance the long-term viability of the target special-status plant occurrences. The Management Plan shall be submitted for review and approval to the CPM.

4. Integrating Special-Status Plant Mitigation with Other Mitigation lands. If all or any portion of the acquired Desert Tortoise, Waters of the State, or other required compensation lands meets the criteria above for special-status plant compensation lands, the portion of the other species' or habitat compensation lands that meets any of the criteria above may be used to fulfill that portion of the obligation for special-status plant mitigation.

5. Compensation Lands Acquisition Requirements. The Project owner shall comply with the following requirements relating to acquisition of the compensation lands after the CPM, has approved the proposed compensation lands:

    a. Preliminary Report. The Project owner, or an approved third party, shall provide a recent preliminary title report, initial hazardous materials survey report, biological analysis, and other necessary or requested documents for the proposed compensation land to the CPM. All documents conveying or conserving compensation lands and all conditions of title are subject to review and approval by the CPM. For conveyances to the State, approval may also be required from the California Department of General Services, the Fish and Game Commission and the Wildlife Conservation Board.

    b. Title/Conveyance. The Project owner shall acquire and transfer fee title to the compensation lands, a conservation easement over the lands, or both fee title and conservation easement, as required by the CPM. Any transfer of a conservation easement or fee title must be to CDFG, a non-profit organization qualified to hold title to and manage compensation lands (pursuant to California Government Code section 65965), or to BLM or other public agency approved by the CPM. If an approved non-profit organization holds fee title to the compensation lands, a conservation easement shall be recorded in favor of CDFG or another entity approved by the CPM. If an entity other than CDFG holds a conservation easement over the compensation lands, the CPM may require that CDFG or another entity approved by the CPM, in consultation with CDFG, be named a third party beneficiary of the conservation easement. The Project owner shall obtain approval of the CPM of the terms of any transfer of fee title or conservation easement to the compensation lands.

c. Initial Protection and Habitat Improvement. The Project owner shall fund activities that the CPM requires for the initial protection and habitat improvement of the compensation lands. These activities will vary depending on the condition and location of the land acquired, but may include trash removal, construction and repair of fences, invasive plant removal, and similar measures to protect habitat and improve habitat quality on the compensation lands. The costs of these activities would use the estimated cost per acre for Desert Tortoise mitigation as a best available proxy, at the ratio of 3:1 for Rank 1 plants and 2:1 for Rank 2 plants, but actual costs will vary depending on the measures that are required for the compensation lands. A non-profit organization, CDFG or another public agency may hold and expend the habitat improvement funds if it is qualified to manage the compensation lands (pursuant to California Government Code section 65965), if it meets the approval of the CPM in consultation with CDFG, and if it is authorized to participate in implementing the required activities on the compensation lands. If CDFG takes fee title to the compensation lands, the habitat improvement fund must be paid to CDFG or its designee.

d. Property Analysis Record. Upon identification of the compensation lands, the Project owner shall conduct a Property Analysis Record (PAR) or PAR-like analysis to establish the appropriate amount of the long-term maintenance and management fund to pay the in-perpetuity management of the compensation lands. The PAR or PAR-like analysis must be approved by the CPM before it can be used to establish funding levels or management activities for the compensation lands.

e. Long-term Maintenance and Management Funding. The Project owner shall deposit in NFWF's REAT Account a ~~non-wasting~~ capital long-term maintenance and management fee in the amount determined through the Property Analysis Record (PAR) or PAR-like analysis conducted for the compensation lands.
The CPM, in consultation with CDFG, may designate another non-profit organization to hold the long-term maintenance and management fee if the organization is qualified to manage the compensation lands in perpetuity. If CDFG takes fee title to the compensation lands, CDFG shall determine whether it will hold the long-term management fee in the special deposit fund, leave the money in the REAT Account, or designate another entity to manage the long-term maintenance and management fee for CDFG and with CDFG supervision. .

f. Interest, Principal, and Pooling of Funds. The Project owner shall ensure that an agreement is in place with the long-term maintenance and management fund (endowment) holder/manager to ensure the following requirements are met:

   i. Interest. Interest generated from the initial capital long-term maintenance and management fund shall be available for

reinvestment into the principal and for the long-term operation, management, and protection of the approved compensation lands, including reasonable administrative overhead, biological monitoring, improvements to carrying capacity, law enforcement measures, and any other action that is approved by the CPM and is designed to protect or improve the habitat values of the compensation lands.

ii. Withdrawal of Principal. The long-term maintenance and management fund principal shall not be drawn upon unless such withdrawal is deemed necessary by the CPM or by the approved third-party long-term maintenance and management fund manager, to ensure the continued viability of the species on the compensation lands.

iii. Pooling Long-Term Maintenance and Management Funds. An entity approved to hold long-term maintenance and management funds for the Project may pool those funds with similar ~~non-wasting~~ funds that it holds from other projects for long-term maintenance and management of compensation lands for special-status plants. However, for reporting purposes, the long-term maintenance and management funds for this Project must be tracked and reported individually to the CPM.

g. Other Expenses. In addition to the costs listed above, the Project owner shall be responsible for all other costs related to acquisition of compensation lands and conservation easements, including but not limited to the title and document review costs incurred from other state agency reviews, overhead related to providing compensation lands to CDFG or an approved third party, escrow fees or costs, environmental contaminants clearance, and other site cleanup measures.

h. Mitigation Security. The Project owner shall provide financial assurances to the CPM to guarantee that an adequate level of funding is available to implement any of the mitigation measures required by this condition that are not completed prior to the start of ground-disturbing Project activities. Financial assurances shall be provided to the CPM in the form of an irrevocable letter of credit, a pledged savings account or another form of security ("Security") approved by the CPM. The amount of the Security shall use the estimated cost per acre for Desert Tortoise mitigation as a best available proxy, at a ratio of 3:1 for Rank 1 plants and 2:1 for Rank 2 plants, for every acre of habitat supporting the target special-status plant species which is significantly impacted by the project. The actual costs to comply with this condition will vary depending on the actual costs of acquiring compensation habitat, the costs of initially improving the habitat, and the actual costs of long-term management as determined by a PAR report. Prior to submitting the Security to the CPM, the Project owner shall obtain the CPM's approval of the form of the Security. The CPM may draw on the Security if the CPM determines the Project owner has

failed to comply with the requirements specified in this condition. The CPM may use money from the Security solely for implementation of the requirements of this condition. The CPM's use of the Security to implement measures in this condition may not fully satisfy the Project owner's obligations under this condition, and the Project owner remains responsible for satisfying the obligations under this condition if the Security is insufficient. The unused Security shall be returned to the Project owner in whole or in part upon successful completion of the associated requirements in this condition.

i. NFWF REAT Account. The Project owner may elect to comply with the requirements in this condition for acquisition of compensation lands, initial protection and habitat improvement on the compensation lands, or long-term maintenance and management of the compensation lands by funding, or any combination of these three requirements, by providing funds to implement those measures into the Renewable Energy Action Team (REAT) Account established with the National Fish and Wildlife Foundation (NFWF). To use this option, the Project owner must make an initial deposit to the REAT Account in an amount equal to the estimated costs (as set forth in the Security section of this condition) of implementing the requirement. If the actual cost of the acquisition, initial protection and habitat improvements, or long-term funding is more than the estimated amount initially paid by the Project owner, the Project owner shall make an additional deposit into the REAT Account sufficient to cover the actual acquisition costs, the actual costs of initial protection and habitat improvement on the compensation lands, and the long-term funding requirements as established in an approved PAR or PAR-like analysis. If those actual costs or PAR projections are less than the amount initially transferred by the Applicant, the remaining balance shall be returned to the Project owner.

   The responsibility for acquisition of compensation lands may be delegated to a third party other than NFWF, such as a non-governmental organization supportive of desert habitat conservation, by written agreement of the Energy Commission. Such delegation shall be subject to approval by the CPM, in consultation with CDFG, BLM and USFWS, prior to land acquisition, enhancement or management activities. Agreements to delegate land acquisition to an approved third party, or to manage compensation lands, shall be executed and implemented within 18 months of the start of ground disturbance.

II. Compensatory Mitigation by Habitat Enhancement/Restoration: As an alternative or adjunct to land acquisition for compensatory mitigation the Project owner may undertake habitat enhancement or restoration for the target special-status plant species. Habitat enhancement or restoration activities must achieve protection at a 3:1 ratio for Rank 1 plants and 2:1 for Rank 2 plants, with improvements applied to three acres, or two acres, respectively, of habitat for every acre special-status plant habitat directly or

indirectly disturbed by the Project Disturbance Area (for example if the area occupied by the special status plant collectively measured is 1/4 acre than the improvements would be applied to an area equal to 3/4 of an acre at a 3:1 ratio, or one-half acre at a 2:1 ratio). Examples of suitable enhancement projects include but are not limited to the following: i) control unauthorized vehicle use into an occurrence (or pedestrian use if clearly damaging to the species); ii) control of invasive non-native plants that infest or pose an immediate threat to an occurrence; iii) exclude grazing by wild burros or livestock from an occurrence; or iv) restore lost or degraded hydrologic or geomorphic functions critical to the species by restoring previously diverted flows, removing obstructions to the wind sand transport corridor above an occurrence, or increasing groundwater availability for dependent species.

If the Project owner elects to undertake a habitat enhancement project for mitigation, the project must meet the following performance standards: The proposed enhancement project shall achieve rescue of an off-site occurrence that is currently assessed, based on the NatureServe threat ranking system[14] with one of the following threat ranks: a) long-term decline >30%; b) an immediate threat that affects >30% of the population, or c) has an overall threat impact that is High to Very High. “Rescue” would be considered successful if it achieves an improvement in the occurrence trend to “stable” or “increasing” status, or downgrading of the overall threat rank to slight or low (from “High” to “Very High”).

If the Project owner elects to undertake a habitat enhancement project for mitigation, they shall submit a Habitat Enhancement/Restoration Plan to the CPM for review and approval, and shall provide sufficient funding for implementation and monitoring of the Plan. The amount of the Security shall use the estimated cost per acre for Desert Tortoise mitigation as a best available proxy, at the ratio of 3:1 for Rank 1 plants and 2:1 for Rank 2 plants, for every acre of habitat supporting the target special-status plant species which is directly or indirectly impacted by the project. The amount of the security may be adjusted based on the actual costs of implementing the enhancement, restoration and monitoring. The implementation and monitoring of the enhancement/restoration may be undertaken by an appropriate third party such as NFWF, subject to approval by the CPM. The Habitat Enhancement/Restoration Plan shall include each of the following:

1. Goals and Objectives. Define the goals of the restoration or enhancement project and a measurable course of action developed to achieve those goals. The objective of the proposed habitat enhancement plan shall

[14] Master, L., D. Faber-Langendoen, R. Bittman, G. A., Hammerson, B. Heidel, J. Nichols, L. Ramsay, and A. Tomaino. 2009. *NatureServe Conservation Status Assessments: Factors for Assessing Extinction Risk.* NatureServe, Arlington, VA. Online: http://www.natureserve.org/publications/ConsStatusAssess_StatusFactors.pdf , “Threats”. See also: Morse, L.E., J.M. Randall, N. Benton, R. Hiebert, and S. Lu. 2004. An Invasive Species Assessment Protocol: Evaluating Non-Native Plants for Their Impact on Biodiversity. Version 1. NatureServe, Arlington, Virginia. Online: http://www.natureserve.org/publications/pubs/invasiveSpecies.pdf

include restoration of a target special-status plant occurrence that is currently threatened with a long-term decline. The proposed enhancement plan shall achieve an improvement in the occurrence trend to “stable” or “increasing” status, or downgrading of the overall threat rank to slight or low (from “High” to “Very High”).

2. Historical Conditions. Provide a description of the pre-impact or historical conditions (before the site was degraded by weeds or grazing or ORV, etc.), and the desired conditions.
3. Site Characteristics. Describe other site characteristics relevant to the restoration or enhancement project (e.g., composition of native and pest plants, topography and drainage patterns, soil types, geomorphic and hydrologic processes important to the site or species.
4. Ecological Factors. Describe other important ecological factors of the species being protected, restored, or enhanced such as total population, reproduction, distribution, pollinators, etc.
5. Methods. Describe the restoration methods that will be used (e.g., invasive exotics control, site protection, seedling protection, propagation techniques, etc.) and the long-term maintenance required. The implementation phase of the enhancement must be completed within five years.
6. Budget. Provide a detailed budget and time-line, and develop clear, measurable, objective-driven annual success criteria.
7. Monitoring. Develop clear, measurable monitoring methods that can be used to evaluate the effectiveness of the restoration and the benefit to the affected species. The Plan shall include a minimum of five years of quarterly monitoring, and then annual monitoring for the remainder of the enhancement project, and until the performance standards for rescue of a threatened occurrence are met. At a minimum the progress reports shall include: quantitative measurements of the projects progress in meeting the enhancement project success criteria, detailed description of remedial actions taken or proposed, and contact information for the responsible parties.
8. Reporting Program. The Plan shall ensure accountability with a reporting program that includes progress toward goals and success criteria. Include names of responsible parties.
9. Contingency Plan. Describe the contingency plan for failure to meet annual goals.
10. Long-term Protection. Include proof of long-term protection for the restoration site. For private lands this would include conservations easements or other deed restrictions; projects on public lands must be contained in a Desert Wildlife Management Area, Wildlife Habitat Management Area, or other land use protections that will protect the mitigation site and target species.

III. Contingency Measures

1. Preservation of the Germplasm of Affected Special-Status Plants. For all significant impacts to special-status plants, mitigation shall also include seed collection from the affected special-status plants population on-site prior to construction to conserve the germplasm and provide a seed source for restoration efforts. The seed shall be collected under the supervision or guidance of a reputable seed storage facility such as the Rancho Santa Ana Botanical Garden Seed Conservation Program, San Diego Natural History Museum, or the Missouri Botanical Garden. The costs associated with the long-term storage of the seed shall be the responsibility of the Project owner. Any efforts to propagate and reintroduce special-status plants from seeds in the wild shall be carried out under the direct supervision of specialists such as those listed above and as part of a Habitat Restoration/Enhancement Plan approved by the CPM.

2. Compensatory Mitigation by Conducting or Contributing to a Management Plan for the Affected Species. Subject to approval of the CPM, as a contingency measure in the event there are no opportunities for mitigation through acquisition or restoration/enhancement to meet the obligations for off-site mitigation as described in Section C.1-3 of this condition, , a Management Plan for the affected special-status plant species may be conducted or funded. The goal of the Management Plan is to devise a science-based, region-wide strategy to ensure the long-term viability of the affected species, and to acquire, protect, and restore existing populations and the habitat that supports them. The information gathered shall be used to develop conservation approaches to address the identified risk factors. These approaches include land allocations, restoration needs, identifying and preserving important refugia to facilitate species dispersal and maintain biodiversity in the face of climate change, recommending Best Management Practices or other measures that could be used to minimize threats, and identifying planning needs at the regional level. The results of the study would also be provided to the resource agencies, conservation organizations, and academic institutions, as well as the state's Natural Diversity Database and Consortium of California Herbaria.

3. Under this contingency measure, the Project owner shall acquire all available information on the distribution, status or health of known occurrences, ecological requirements, and ownership and management opportunities of the affected special-status plant species and other special status plants known to occur in the Chuckwalla Valley. Some of these late blooming species are only known from a few viable occurrences in California, and historic occurrences that have not been re-located or surveyed since they were first documented. At a minimum, the study shall include the following:

    a. Occurrence and Life History Review. The Study shall include an evaluation of all documented, historical and reported localities for the affected species, and a review of current information on the species life

history. This would include a review of the CNDDB database, records from regional and national herbaria, literature review, consultation with U.C. Riverside, San Diego Natural History Museum, and other educational institutions or natural heritage organizations in California, Arizona, and Nevada, etc.), other biotechnical survey reports from the region, and information from regional botanical experts.

b. Conduct Site Visits to Documented and Reported Localities. Documented and reported occurrences would be evaluated in the field during the appropriate time of the year for each late blooming species. If located, these occurrences would be evaluated for population size (area and quantity), population trend, ecological characteristics, soils, habitat quality, potential threats, degree and immediacy of threats, ownership and management opportunities. GPS location data would also be collected during these site visits.

c. Survey Surrounding Areas. Areas surrounding the occurrences that contain habitat suitable to support the affected species shall be surveyed to determine the full extent of its range and distribution. If additional populations are found, collect data (GPS and assessment) on these additional populations consistent with III.2 above.

d. Prepare Report on Status, Distribution, and Management Needs. A report shall be prepared that contains the results of the surveys and assessment. The report shall contain the following components: a) Range and Distribution (including maps and GPS data); b) Abundance and Population Trends; c) Life History; d) Habitat Necessary for Survival; d) Factors Affecting Ability to Survive and Reproduce; e) Degree and Immediacy of Threat; f) Ownership and Management Opportunities for Protection or Recovery; g) Sources of Information, and g) Conclusions. The conclusions shall contain an explanation of whether the species' survival is threatened by any of the following factors: i) present or threatened modification or destruction of its habitat; ii) competition; iii) disease; iv) other natural occurrences (such as climate change) or human-related activities. This valuable information will provide a better understanding of the ecological factors driving the distribution of these species, and will identify opportunities for mitigation and management opportunities for recovery. All data from this study will be submitted for incorporation into the CNDDB system and the study report will be made available to resource agencies, and conservation groups, and other interested parties.

e. The cost to implement or fund the study shall be no greater than the cost for acquisition, enhancement, and long-term management of compensatory mitigation lands based on the specifications and standards for acquisition or restoration/enhancement described above under D.I and D.II.

Verification: The Special-Status Plant Impact Avoidance and Minimization Measures shall be incorporated into the BRMIMP as required under Condition of Certification **BIO-7.**

The Project owner shall notify the CPM and the BLM State Botanist no less than 14 days prior to the start of late-season surveys and provide a target list of late season special-status plants that will be considered. Concurrently, the Project owner shall coordinate with BLM to obtain a permit for seed collection. Seed collection is required for all special-status plants located within the Project Disturbance Area and shall be conducted according to the specifications in Section D.III.1 of this condition and with all terms and conditions of the BLM permit.

Raw GPS data, metadata, and CNDDB field forms shall be submitted to the CPM within two weeks of the completion of each survey. A preliminary summary of results for the late summer/fall botanical surveys, prepared according to guidelines in Section B of this condition, shall also be submitted to the CPM and BLM's State Botanist within two weeks following the completion of the surveys. If surveys are split into more than one period, then a summary letter shall be submitted following each survey period. The Final Summer-Fall Botanical Survey Report, GIS shape files and metadata shall be submitted to the BLM State Botanist and the CPM no less than 30 days prior to the start of ground-disturbing activities. The Final Report shall include a detailed accounting of the acreage of Project impacts to special-status plant occurrences.

For any special-status plant species located within the Project Disturbance Area, the Project owner shall submit to the CPM to less than 30 days prior to the start of ground-disturbing activities proof, in the form of a letter or receipt, of the seed or other propagules collected pursuant to Section D.III #1 of this Condition.

The draft conceptual Special-Status Plant Mitigation Plan, as described under Section C.4 of this condition, shall be submitted to the CPM for review and approval no less than 30 days prior to the start of ground-disturbing activities.

The Project owner shall immediately provide written notification to the CPM, CDFG, USFWS, and BLM State Botanist if it detects a State- or Federal-Listed Species, or BLM Sensitive Species at any time during its late summer/fall botanical surveys or at any time thereafter through the life of the Project, including conclusion of Project decommissioning.

No less than 30 days prior to the start of ground-disturbing activities the Project owner shall submit grading plans and construction drawings to the CPM which depict the location of Environmentally Sensitive Areas and the Avoidance and Minimization Measures contained in Section A of this Condition, and under Section C.1-3.

If compensatory mitigation is required, pursuant to Section C.1-3, no less than 30 days prior to the start of ground-disturbing activities the Project owner shall submit to the CPM the form of Security adequate to acquire compensatory mitigation lands and/or undertake habitat enhancement or restoration activities, as described in this condition. Actual Security shall be provided 7 days prior to start of ground-disturbing activities.

No fewer than 90 days prior to acquisition of compensatory mitigation lands, the Project owner shall submit a formal acquisition proposal and draft Management Plan for the proposed lands to the CPM, with copies to CDFG, USFWS, and BLM, describing the parcels intended for purchase and shall obtain approval from the CPM prior to the

acquisition. No fewer than 90 days prior to acquisition of compensatory mitigation lands, the Project owner shall submit to the CPM and obtain CPM approval of any agreements to delegate land acquisition to an approved third party, or to manage compensation lands; such agreement shall be executed and implemented within 18 months of the start of ground disturbance.

No fewer than 30 days after acquisition of the property the Project owner shall deposit the funds required by Section I e above (long term management and maintenance fee) and provide proof of the deposit to the CPM.

The Project owner or an approved third party shall complete the acquisition and all required transfers of the compensation lands, and provide written verification to the CPM of such completion no later than 18 months after the start of Project ground-disturbing activities. If NFWF or another approved third party is being used for the acquisition, the Project owner shall ensure that funds needed to accomplish the acquisition are transferred in timely manner to facilitate the planned acquisition and to ensure the land can be acquired and transferred prior to the 18-month deadline. If habitat enhancement is proposed, no later than six months following the start of ground-disturbing activities, the Project owner shall obtain CPM approval of the final Habitat Enhancement/Restoration Plan, prepared in accordance with Section D, and submit to the CPM or a third party approved by the CPM Security adequate for long-term implementation and monitoring of the Habitat Enhancement/Restoration Plan.

Enhancement/restoration activities shall be initiated no later than 12 months from the start of construction. The implementation phase of the enhancement project shall be completed within five years of initiation. Until completion of the five-year implementation portion of the enhancement action, a report shall be prepared and submitted as part of the Annual Compliance Report. This report shall provide, at a minimum: a summary of activities for the preceding year and a summary of activities for the following year; quantitative measurements of the Project's progress in meeting the enhancement project success criteria; detailed description of remedial actions taken or proposed; and contact information for the responsible parties.

If a contingency measure is required, as described in Section D.III of this condition, the Project owner shall submit commence no later than six months following the start of ground-disturbing activities. The draft study shall be submitted to the CPM and BLM State Botanist for review and approval no more than two years following the start of ground-disturbing activities. The final study shall be submitted no more than 30 months following the start of ground-disturbing activities.

If a Distribution Study is implemented as contingency mitigation, the study shall be initiated no later than 6 months from the start of construction. The implementation phase of the study shall be completed within two years of the start of construction.
Within 18 months of ground-disturbing activities, the Project owner shall transfer to the CPM or an approved third party the difference between the Security paid and the actual costs of (1) acquiring compensatory mitigation lands, completing initial protection and habitat improvement , and funding the long-term maintenance and management of compensatory mitigation lands; and/or (2) implementing and providing for the long-term protection and monitoring of habitat enhancement or restoration activities.

Implementation of the special-status plant impact avoidance and minimization measures shall be reported in the Monthly Compliance Reports prepared by the Designated Botanist. Within 30 days after completion of Project construction, the Project owner shall provide to the CPM, for review and approval, in consultation with the BLM State Botanist, a written construction termination report identifying how measures have been completed.

The Project owner shall submit a monitoring report every year for the life of the project to monitor effectiveness of protection measures for all avoided special-status plants to the CPM and BLM State Botanist. The monitoring report shall include: dates of worker awareness training sessions and attendees, completed CNDDB field forms for each avoided occurrence on-site and within 100 feet of the Project boundary off-site, and description of the remedial action, if warranted and planned for the upcoming year. The completed forms shall include an inventory of the special-status plant occurrences and description of the habitat conditions, an indication of population and habitat quality trends.

SAND DUNE/MOJAVE FRINGE-TOED LIZARD MITIGATION

Rationale for Modification: PSI believes that it can make design modifications to the northern and eastern fence of Phase 2 that will allow sand to move through the site thereby eliminating any indirect impacts related to the blocking of the sand transport corridor. Therefore, PSI has requested the Condition be modified to allow it the opportunity to prove such design to the CPM will be an effective an avoidance measure rather than providing compensatory mitigation for indirect impacts to Mojave Fringe Toed Lizard.

BIO-20 To mitigate for habitat loss and direct impacts to Mojave fringe-toed lizards the Project owner shall provide compensatory mitigation, which may include compensation lands purchased in fee or in easement in whole or in part, at the following ratios:

- 3:1 mitigation for direct impacts to stabilized and partially stabilized sand dunes (~~285 acres~~ per **BIO-29 – Table 2** or final acreage impacted by the Project footprint);
- 1:1 mitigation for direct impacts non-dune Mojave fringe-toed lizard habitat (~~1,496 acres~~ per **BIO-29 – Table 2** or final acreage impacted by the Project footprint); and
- If the Project owner includes fencing along the northern and eastern boundaries of Phase 2 that includes features that block the wind from ground level to a height of 5 feet, the Project owner shall provide 0.5:1 mitigation for indirect impacts to stabilized and partially stabilized sand dunes (~~1,629 acres~~ per **BIO-29 – Table 2** or final acreage impacted by the Project footprint).

If compensation lands are acquired, the Project owner shall provide funding for the acquisition in fee title or in easement, initial habitat improvements, and long-term maintenance and management of the compensation lands. In

addition, the compensation lands must include a minimum of 855 acres of stabilized and partially stabilized sand dune habitat.

1. Criteria for Compensation Lands: The compensation lands selected for acquisition shall:

   a. Provide suitable habitat for Mojave fringe-toed lizards, and, aside from the minimum amount of stabilized and partially stabilized sand dunes, may include stabilized and partially stabilized desert dunes, sand drifts over playas, or Sonoran creosote bush scrub;

   b. Be within the Palen or Chuckwalla valleys with potential to contribute to Mojave fringe-toed lizard habitat connectivity and build linkages between known populations of Mojave fringe-toed lizards and preserve lands with suitable habitat;

   c. Be prioritized near larger blocks of lands that are either already protected or planned for protection, or which could feasibly be protected long-term by a public resource agency or a non-governmental organization dedicated to habitat preservation;

   d. Provide quality habitat for Mojave fringe-toed lizard that has the capacity to regenerate naturally when disturbances are removed;

   e. Not have a history of intensive recreational use or other disturbance that might make habitat recovery and restoration infeasible;

   f. Not be characterized by high densities of invasive species, either on or immediately adjacent to the parcels under consideration, that might jeopardize habitat recovery and restoration;

   g. Not contain hazardous wastes that cannot be removed to the extent the site is suitable for habitat;

   h. ~~Not be subject to property constraints (i.e. mineral leases, cultural resources)~~ Have water and mineral rights included as part of the acquisition, unless the CPM, in consultation with CDFG, BLM and USFWS, agrees in writing to the acceptability of the land; and

   i. Be on land for which long-term management is feasible.

2. Security for Implementation of Mitigation: The Project owner shall provide financial assurances to the CPM to guarantee that an adequate level of funding is available to implement the acquisitions and enhancement of Mojave fringe-toed lizard habitat as described in this condition. These funds shall be used solely for implementation of the measures associated with the Project. Financial assurance can be provided to the CPM according to the measures outlined in **BIO-12**, and within the time period specified for this assurance (see the verification section at the end of this condition). The final amount due will be determined by an updated appraisal and a PAR analysis conducted as described in **BIO-12**, but current estimates are included in **Biological Resources Tables 22** and **23** located at the beginning of the Conditions of Certification subsection.

3. Preparation of Management Plan: The Project owner shall submit to the CPM, BLM, and CDFG a draft Management Plan that reflects site-specific enhancement measures for the Mojave fringe-toed lizard habitat on the acquired compensation lands. The objective of the Management Plan shall be to enhance the value of the compensation lands for Mojave fringe-toed lizards, and may include enhancement actions such as weed control, fencing to exclude livestock, erosion control, or protection of sand sources or sand transport corridors.

Verification: No later than 30 days prior to beginning Project ground-disturbing activities, the Project owner shall submit to the CPM for review and approval plans detailing fencing that allows sand movement through the northern and eastern boundaries of Phase 2.

No later than 30 days prior to beginning Project ground-disturbing activities, the Project owner shall provide written verification of an approved form of Security in accordance with this condition of certification. Actual Security shall be provided no later than 7 days prior to the beginning of Project ground-disturbing activities for each Project phase as described in **BIO-29**. The Project owner, or an approved third party, shall complete and provide written verification of the proposed compensation lands acquisition within 18 months of the start of Project ground-disturbing activities for each Project phase.

No less than 90 days prior to acquisition of the property, the Project owner shall submit a formal acquisition proposal to the CPM, CDFG, and USFWS describing the parcels intended for purchase.

The Project owner, or an approved third party, shall provide the CPM, BLM, and CDFG, with a management plan for the compensation lands and associated funds within 180 days of the land or easement purchase, as determined by the date on the title. The CPM shall review and approve the management plan, in consultation with BLM and CDFG.

Within 90 days after completion of Project construction, the Project owner shall provide to the CPM and CDFG an analysis with the final accounting of the amount (detailed by habitat type) of Mojave fringe-toed lizard habitat disturbed during Project construction.

The Project owner shall provide written verification to the CPM, and CDFG that the compensation lands or conservation easements have been acquired and recorded in favor of the approved recipient no later than 18 months from the start of ground-disturbing activities.

MITIGATION FOR IMPACTS TO STATE WATERS

BIO-21 The Project owner shall implement the following measures to avoid, minimize and mitigate for direct and indirect impacts to waters of the state and to satisfy requirements of California Fish and Game Code sections 1600 and 1607.

1. Acquire Off-Site State Waters: The Project owner shall acquire, in fee or in easement, a parcel or parcels of land that includes ~~at least 608 acres of~~

state jurisdictional waters per **BIO-29 – Table 2**, or the area of state waters directly or indirectly impacted by the final Project footprint. The Project footprint means all lands disturbed by construction and operation of the Palen Project, including all linears. The parcel or parcels comprising the ~~608 acres of~~ ephemeral washes shall include ~~at least 444 acres of~~ desert dry wash woodland per **BIO-29 – Table 2**, or the acreage of desert dry was woodland impacted by the final Project footprint at a 3:1 ratio. The terms and conditions of this acquisition or easement shall be as described in Condition of Certification **BIO 12**, and the timing associated with **BIO-29** (phasing). The current estimated costs are included in **BIO-29 – Table 3 ~~Biological Resources Tables 22~~** and **~~23~~** located at the beginning of the Conditions of Certification subsection. Mitigation for impacts to state waters shall occur within the Chuckwalla, East Salton Sea, Hayfield, Rice, or portion of Whitewater within the NECO, Hydrologic Units (HUs) or the Palo Verde Watershed and be prioritized within the Chuckwalla HU ~~Valley basin~~ in the Palen or adjacent watersheds.

2. Security for Implementation of Mitigation: The Project owner shall provide financial assurances to the CPM and CDFG to guarantee that an adequate level of funding is available to implement the acquisitions and enhancement of state waters as described in this condition. These funds shall be used solely for implementation of the measures associated with the Project. Financial assurance can be provided to the CPM and CDFG in the form of an irrevocable letter of credit, a pledged savings account or Security prior to initiating ground-disturbing Project activities. Prior to submittal to the CPM, the Security shall be approved by the CPM, in consultation with CDFG, to ensure funding. The final amount due shall be determined by updated appraisals and the PAR analysis conducted pursuant to **BIO-12.**

3. Preparation of Management Plan: The Project owner shall submit to the CPM and CDFG a draft Management Plan that reflects site-specific enhancement measures for the drainages on the acquired compensation lands. The objective of the Management Plan shall be to enhance the wildlife value of the drainages, and may include enhancement actions such as weed control, fencing to exclude livestock, or erosion control.

4. Code of Regulations: The Project owner shall provide a copy of this condition (Condition of Certification **BIO-21**) from the Energy Commission Decision to all contractors, subcontractors, and the Applicant's Project supervisors. Copies shall be readily available at work sites at all times during periods of active work and must be presented to any CDFG personnel upon demand. The CPM reserves the right to issue a stop work order or allow CDFG to issue a stop work order after giving notice to the Project owner and the CPM, if the CPM in consultation with CDFG, determines that the Project owner has breached any of the terms or conditions or for other reasons, including but not limited to the following:

a. The information provided by the Applicant regarding impacts to waters of the state is incomplete or inaccurate;

b. New information becomes available that was not known in preparing the terms and conditions; or

c. The Project or Project activities as described in the Revised Staff Assessment have changed.

5. Road Crossings at Streams. The Project owner shall preserve pre-development downstream flows and sediment transport in washes crossed by permanent roads by incorporating culverts and Arizona crossings at stream crossings. Arizona crossings are the preferred option and shall be employed wherever such crossings do not present a safety hazard and where the roadbed elevation allows the construction of such crossings. Drainages that have been graded for temporary consruction access shall be restored to original contours and surface drainage patterns and shall be revegetated according to specifications in **BIO-8** ~~27~~.

6. Diffuser Deisgn. The Project owner shall maintain pre-project flow patterns (location and volume of flows) downstream of the Project boundaries. Flows shall not be discharged indiscriminantly as sheet flow across the entire length of the diffusers, irrespective of the natural surface drainage patterns, but rather shall be designed to discharge into existing natural washes downslope of the Project.

7. Best Management Practices: The Project owner shall also comply with the following conditions to protect drainages near the Project Disturbance Area:

   a. The Project owner shall minimize road building, construction activities and vegetation clearing within ephemeral drainages to the extent feasible.

   b. The Project owner shall not allow water containing mud, silt, or other pollutants from grading, aggregate washing, or other activities to enter ephemeral drainages or be placed in locations that may be subjected to high storm flows.

   c. The Project owner shall comply with all litter and pollution laws. All contractors, subcontractors, and employees shall also obey these laws, and it shall be the responsibility of the Project owner to ensure compliance.

   d. Spoil sites shall be located at least 30 feet from the boundaries and drainages or in locations that may be subjected to high storm flows, where spoils might be washed back into drainages.

   e. Raw cement/concrete or washings thereof, asphalt, paint or other coating material, oil or other petroleum products, or any other substances that could be hazardous to vegetation or wildlife resources, resulting from Project-related activities, shall be prevented from contaminating the soil and/or entering waters of the state. These

materials, placed within or where they may enter a drainage, shall be removed immediately.

f. No broken concrete, debris, soil, silt, sand, bark, slash, sawdust, rubbish, cement or concrete or washings thereof, oil or petroleum products or other organic or earthen material from any construction or associated activity of whatever nature shall be allowed to enter into, or placed where it may be washed by rainfall or runoff into, waters of the state.

g. When operations are completed, any excess materials or debris shall be removed from the work area. No rubbish shall be deposited within 150 feet of the high water mark of any drainage.

h. No equipment maintenance shall occur within 150 feet of any ephemeral drainage where petroleum products or other pollutants from the equipment may enter these areas under any flow.

8. Changes of Conditions. A notifying report shall be provided to the CPM and CDFG if a change of conditions is identified. As used here, change of condition refers to the process, procedures, and methods of operation of a Project; the biological and physical characteristics of a Project area; or the laws or regulations pertinent to the Project as defined below. A copy of the notifying change of conditions report shall be included in the annual reports or until it is deemed unnecessary by the CPM, in consultation with CDFG.

   a. Biological Conditions: a change in biological conditions includes, but is not limited to, the following: 1) the presence of biological resources within or adjacent to the Project area, whether native or non-native, not previously known to occur in the area; or 2) the presence of biological resources within or adjacent to the Project area, whether native or non-native, the status of which has changed to endangered, rare, or threatened, as defined in section 15380 of Title 14 of the California Code of Regulations.

   b. Physical Conditions: a change in physical conditions includes, but is not limited to, the following: 1) a change in the morphology of a river, stream, or lake, such as the lowering of a bed or scouring of a bank, or substantial changes in stream form and configuration caused by storm events; 2) the movement of a river or stream channel to a different location; 3) a reduction of or other change in vegetation on the bed, channel, or bank of a drainage, or 4) changes to the hydrologic regime such as fluctuations in the timing or volume of water flows in a river or stream.

   c. Legal Conditions: a change in legal conditions includes, but is not limited to, a change in Regulations, Statutory Law, a Judicial or Court decision, or the listing of a species, the status of which has changed to endangered, rare, or threatened, as defined in section 15380 of Title 14 of the California Code of Regulations.

Verification: No less than 30 days prior to the start of construction-related ground disturbance activities potentially affecting waters of the state, the Project owner shall provide written verification (i.e., through incorporation into the BRMIMP) to the CPM that the above best management practices will be implemented. The Project owner shall also provide a discussion of work in waters of the state in Annual Compliance Reports for the duration of the Project.

No less than 30 days prior to beginning Project ground-disturbing activities for each project phase as described in **BIO-29**, the Project owner shall provide to the CPM design drawings of drainage diffusers depicting how these structures restore pre-development drainage patterns (location and volume of flows) to drainages downstream of the Project boundaries. At the same time the Project owner shall provide design drawings for temporary and permanent stream crossings.

No less than 30 days prior to beginning Project ground-disturbing activities, the Project owner shall provide the form of Security in accordance with this condition of certification. No later than 7 days prior to beginning Project ground-disturbing activities, the Project owner shall provide written verification of the actual Security. The Project owner, or an approved third party, shall complete and provide written verification of the proposed compensation lands acquisition within 18 months of the start of Project ground-disturbing activities.

The Project owner, or an approved third party, shall provide the CPM, BLM, CDFG, and USFWS with a management plan for the compensation lands and associated funds within 180 days of the land or easement purchase, as determined by the date on the title. The CPM shall review and approve the management plan, in consultation with CDFG and the USFWS.

Within 90 days after completion of Project construction, the Project owner shall provide to the CPM, BLM, USFWS, and CDFG an analysis with the final accounting of the amount of jurisdictional state waters disturbed during Project construction.

The Project owner shall provide written verification to the CPM, BLM, USFWS and CDFG that the compensation lands or conservation easements have been acquired and recorded in favor of the approved recipient no later than 18 months of the start of Project ground-disturbing activities. ~~from adoption of the Final Energy Commission Decision for the Palen Solar Power Project.~~

The Project owner shall notify the CPM and CDFG, in writing, at least five days prior to initiation of Project ground-disturbing activities in jurisdictional state waters and at least five days prior to completion of Project activities in jurisdictional areas. The Project owner shall notify the CPM and CDFG of any change of conditions to the Project, impacts to state waters, or the mitigation efforts.

DECOMMISSIONING AND RECLAMATION PLAN

BIO-22 Upon Project closure the Project owner shall implement a final Decommissioning and Reclamation Plan. The Decommissioning and Reclamation Plan shall include a cost estimate for implementing the proposed

decommissioning and reclamation activities, and shall be consistent with the guidelines in BLM's 43 CFR 3809.550 et seq.

Verification: No fewer than 30 days prior to the start of Project-related ground disturbing activities or alternate date as agreed to with the BLM, the Project owner shall provide to the CPM (for review) and BLM (for review and approval) a draft Decommissioning and Reclamation Plan. The plan shall be finalized prior to the start of commercial operation and reviewed every five years thereafter and submitted to the CPM for review and to the BLM for approval. Modifications to the approved Decommissioning and Reclamation Plan shall be made only after approval from the BLM. The Project owner shall provide a copy of the approved Decommissioning and Reclamation Plan and any BLM approved revisions to the CPM.

GROUNDWATER DEPENDENT VEGETATION MONITORING

Rationale for Modification: PSI disagrees with Staff's conservative assumption that the aquifer from which the Project will draw water (180 feet deep) supports the vegetation of concern. PSI believes that such vegetation (phreatophytes) is supported by a shallow groundwater that is not hydraulically connected to the deeper aquifer from which it will draw water. Therefore, PSI has proposed modifications to the condition that will allow it to prove through geological investigation that the lower aquifer is not hydraulically connected to the groundwater that supports the phreatophytes.

BIO-23 The Project owner shall prepare a Groundwater-Dependent Vegetation Monitoring Plan for monitoring the Project effects of groundwater pumping on groundwater dependent vegetation. The monitoring shall encompass the area depicted in *Figure Soil and Water-3 (Project Only Revised Operational Water Supply End of 30 Years)* within the 0.1-foot drawdown polygon of the Model Predicted Drawdown (Galati & Blek 2010i). The vegetation and groundwater data collected as part of the Plan shall be used to determine if remedial action is required, as described in **BIO-24.**

The Project owner may forgo development of a Groundwater Dependent Vegetation Monitoring Plan, or may cease implementation of such a plan, by providing evidence to the CPM that the source of water for the GDEs is regional groundwater rather than a shallow water-bearing zone unrelated to the regional water table as described under Condition 15a – 15d.

The Project owner shall develop and implement a Groundwater-Dependent Vegetation Monitoring Plan (Plan) that meets the performance standards described below and includes the following components:

1. Monitoring Objectives and Performance Standards. The objectives of the Plan shall be to monitor the Project effects of groundwater pumping on vegetation and groundwater-dependent ecosystems (GDEs) and, in conjunction with the remedial action described in **BIO-24**, to ensure that the Project groundwater pumping has a less than significant effect on biological resources. Monitoring shall be conducted at a level of detail

adequate for detecting adverse effects, as reflected in vegetation attributes and groundwater levels in the shallow (alluvial) aquifer. The baseline for groundwater levels shall be the lowest baseline water level as measured at the Project site prior to the start of groundwater pumping.

2. Location of Monitoring Plots: The monitoring plots shall be established within the area depicted in *Figure Soil and Water -3 (Project Only Revised Operational Water Supply End of 30 Years)* within the Model Predicted Drawdown showing the 0.1-foot drawdown polygon (Galati & Blek 2010i). Monitoring shall focus in particular on impacts within the areas most likely to experience groundwater drawdown, therefore the majority of the plots shall be established within the predicted 1-foot drawdown area depicted in *Soil and Water Figure 2 (Project Only Revised Construction Water Supply)* (Galati & Blek 2010i).
3. Monitoring Plots and Controls. Because of the variation in vegetation types and depth to groundwater within the predicted groundwater drawdown zone, the study design shall treat the monitoring plot with a corresponding control plot as a pair (versus comparing the mean of all treatment plots to the mean of all control plots). The "control" plots shall consist of the data collected at the same plot during the baseline (pre-disturbance) monitoring for a pre-disturbance vs. post-disturbance comparison. Appropriate statistical methods shall be used to analyze the differences between the control and monitoring plots (for example, a one-tailed paired-sample statistical test (Manly 2008)[15]).
4. Off-Site Reference Plots: Off-site monitoring plots shall be established as reference sites to distinguish changes in plant vigor seen at the site from the effects of a region-wide drought. The off-site reference plots can be located within Chuckwalla Valley but shall be within areas that would not be affected hydrologically by groundwater pumping for the Project or other projects or agricultural operations. Off-site monitoring reference plots shall be located in the same setting (i.e., dry playa and adjacent sandy plains), in the same climatic region (Sonoran Desert region of California), and contain the same natural communities or vegetation alliances as those to which they are being compared. Impacts from pests and diseases, if present, must also be considered and excluded or adjusted for as part of the analysis.
5. Sample Size and Design The number of monitoring sites shall be established using appropriate statistical methods (for example, by a "priori power analysis" (Elzinga et al. 1998)) and shall be sufficient to achieve adequate (90%) statistical power. Following collection of the baseline data a statistical analysis shall be conducted to refine the power analysis and evaluate the adequacy of the sampling design. If the analysis of baseline data indicates that the sampling design is insufficient to achieve adequate statistical power, the design shall be modified (for example, by adding additional monitoring sites).

[15] Manly, B. 2008. Statistics for Environmental Science and Management (2nd ed). CRC Press/Chapman and Hall. 292 pages.

6. Water Table Monitoring. The Project owner shall install piezometers at each of the dominant vegetation community types within or near the monitoring plots. The number, location, depth and monitoring frequency of the piezometers shall be sufficient to establish the effect of Project groundwater pumping on the shallow aquifer water levels. At a minimum, each piezometer shall be monitored twice per year, in early spring (March) and post-monsoon (September). The piezometers shall be designed to monitor the maximum expected fluctuation in the water table and to last the duration of the Project.

7. Soil Monitoring. Soil salinity and pH shall be monitored annually at every monitoring plot. The Plan shall describe the monitoring devices and techniques used to collect and interpret this data, relative to ecosystem function. One soil core sample per community type shall be collected as part of the baseline data to establish the approximate rooting depth of the phreatophytes, and thereafter shall be repeated every five years. The coring method must provide a continuous core that will provide visual examination of roots and root nodules, soil profile, and soil moisture.

8. Baseline and Long-term Data Collection. At a minimum, baseline data shall be collected at all monitoring sites prior to the start of pumping; however, vegetation data collected from sites farther from the nearest wells will allow for the collection of multiple years of "pre-disturbance" data. Although the Project proposes to begin construction (and pumping) by December 2010, it appears that the effects of pumping would not reach the areas supporting the GDEs or phreatophytic plants for several years (see C.9 **Soil and Water Resources**). Because the proposed well in the northeast portion of the Project (Soil & Water Figure 1, Galati & Blek 2010i) is located in very close proximity to known phreatophytes, this well shall not be used within the first 3 years of the Project in order to allow an adequate period for baseline data collection in the area northeast of the Project. Subject to approval by the CPM, if groundwater pumping ceases or is replaced by other water sources, groundwater and vegetation monitoring shall continue for a period of 5 years or until refined modeling indicates that the groundwater levels have returned to baseline levels and the decline in plant vigor has been restored to pre-disturbance conditions.

9. Target Vegetation Population. The monitoring sites shall include GDEs and other vegetation potentially affected by the drawdown, including phreatophytes documented to occur in the Palen Lake area such as: honey mesquite (*Prosopis glandulosa*); iodine bush (*Allenrolfea occidentalis*), bush seep-weed (*Suaeda moquinii*), jackass clover (*Wislizenia refracta*), four-wing saltbush (*Atriplex canescens*), allscale (*A. polycarpa*), spinescale (*A. spinifera*) and any other sink scrubs and playa margin communities detected during the vegetation mapping described in this condition. Monitoring sites shall also include microphyll woodlands with palo verde (*Cercidium microphyllum*), cat's claw (*Acacia greggii*), and smoke tree (*Psorothamnus spinosus*). Sampling shall also include examples of non-phreatophytes that occur within the affected area (creosote bush (*Larrea tridentata*) and white bursage (*Ambrosia dumosa*)

alliances/associations). The final number of each community type sample needed shall be based on the *priori* power test conducted after the first year of baseline data collection.

10. Fine-Scale Vegetation Mapping. Within the monitoring sites vegetation shall be mapped to the alliance level, consistent with classification protocol in the *Manual of California, 2nd edition* (Sawyer et al. 2009) but any important associations shall also be mapped. Mapping shall be done using minimum 1 meter resolution color orthophotos or higher resolution infrared imagery. The mapping shall also be used to determine the acreages of GDEs and establish the amount of security to be deposited in the event that adverse effects are detected during the monitoring.Boundaries of the permanent plots and any off-site reference sites shall be recorded using GPS technology and depicted on the geo-referenced aerials. GIS shapefiles and metadata shall be submitted along with the draft Plan and any subsequent revisions to the Plan (i.e., following the collection of baseline data and subsequent power analysis).

11. Guidelines for the Monitoring Plan. The Groundwater-Dependent Vegetation Monitoring Plan (Plan) shall be prepared consistent with guidance for designing vegetation monitoring plans and conducting statistical analysis such as those found in Measuring and Monitoring Plant Populations (Elzinga et al. 1998)[16] and Statistics for Environmental Science and Management (Manly 2008)[17]. The Plan shall provide a detailed description of each of the following components:

    a. Sampling Design. The sampling design shall include a description of: a) the populations (vegetation types) sampled; b) number, size, and shape of the sampling units; c) layout of the sampling units; d) methods for permanently marking plots in the field; e) monitoring schedule/frequency; f) vegetation and other attributes sampled; and g) sampling objectives (target/threshold, change/trend-based) for each attribute.

    b. Habitat Function and Values. The Plan shall describe the hydrologic, geologic/geomorphic, geochemical, biological and ecological characteristics of the GDEs, and shall also describe whether species are obligate or facultative; root growth and water acquisition characteristics; morphological adaptations to the desert environment; reproduction and germination characteristics; general and micro-habitat preferences; obligate or facultative halophytes and phreatophytes; role in the morphology of dunes; and importance to wildlife, etc.

    c. Field techniques for measuring vegetation. This will include the vegetation (or other) attributes selected based on a demonstrated knowledge of the biology and morphology of the species, and include a discussion of the limitations involved in each measurement. Examples

[16] Elzinga, C.L., D.W. Salzer, and J.W. Willoughby. 1998. Measuring and monitoring plant populations. BLM Technical Reference 1730-1, Denver, CO. 477 pages.
[17] Manly, B. 2008. Statistics for Environmental Science and Management (2nd ed). CRC Press/Chapman and Hall. 292 pages.

of appropriate field techniques for measuring drought response include: percent dieback; live crown density; percent cover of live (versus dead or residual) vegetation, percent cover/frequency of associated species; percent composition of native versus non-native species; and percent cover based on wetland status codes (OBL, FACW, FAC, FACU, UPL[18]) and status as phreatophytes or halophytes. Photo monitoring shall not be considered an acceptable monitoring method but may be useful to conduct periodically (e.g., every 3 to 5 years).

d. Data Management. Including how the data will be recorded in the field (e.g., using a GPS data dictionary), processed and stored.

e. Training of personnel. Describe minimum standards for training and monitoring personnel.

f. Statistical analysis. Describe statistical methods used to analyze the monitoring data (incorporating the minimum standards for statistical power and error rate described above).

12. Peer Review of the Plan. The draft Plan shall undergo a peer review by recognized experts, which shall include one or more scientists with expertise in: the preparation of monitoring plans for plant populations; the physiological responses of desert phreatophytes to drought stress; assessing the effects of groundwater withdrawal on vegetation in the desert region; and biostatistics. The Project owner shall provide the resumes of suggested peer reviewers to the CPM for review and approval.

13. Annual Monitoring Report. Annual Monitoring Reports shall be submitted to the CPM and BLM and shall include, at a minimum: a) names and contact information for the responsible parties and monitoring personnel; b) summaries of the results of the monitoring as required in **Soil&Water-4 and Soil&Water-5**; c) piezometer monitoring results**,** and a comparison of predicted versus actual water table declines; d) summary of the results of vegetation, groundwater, and soil monitoring data compared to the baseline data for each plot (pre- versus post-disturbance comparison); e) description of sampling and monitoring techniques used for each attribute; f) description of the data management and statistical analysis; g) photos; h) conclusions and recommendations for remedial action, if the monitoring data indicates that the threshold described below has been met.

    The first Annual Monitoring Report shall include an appropriate statistical analysis using the first year baseline monitoring data to assess whether the sampling design was adequate to provide statistically meaningful data, as described above. If warranted, the first year Annual Monitoring Report shall include recommendations for revisions to the Plan based on this analysis.

[18] OBL= Obligate Wetland; FACW= Facultative Wetland; FAC= Facultative; FACU= Facultative Upland UPL= Obligate Upland. *In;* U.S. Fish and Wildlife Service. 1993. **1993 supplement to list of plant species that occur in wetlands: Northwest (Region 9).** Supplement to U.S. Fish & Wildlife Service Biological Report 88 (24.9). Online: http://plants.usda.gov/wetinfo.html

14. Threshold for Remedial Action: The Project owner shall implement remedial action, as described in Condition of Certification **BIO-24,** if the monitoring described in **BIO-23** detects a decline in plant vigor of 20 percent or more compared to the same plots pre-disturbance AND also detects a decline in the alluvial (shallow) aquifer confirmed by two consecutive annual water monitoring events in any amount greater than the lowest baseline water level as measured prior to groundwater pumping. If regional drought, off-site pumping or other activities unrelated to the Project are also contributing to the decline in water table, the Project owner shall only be responsible for the portion of the effect that can be statistically demonstrated to be the result of Project pumping. To determine whether declines in plant vigor ~~and aquifers are is~~ are related to Project pumping as opposed to regionwide drought or offsite pumping conditions the Project owner shall install a network background monitoring piezometers and incorporate these datra in the ~~this analysis in the~~ assessment of Project-related effects on GDEs.

15. To understand the source of the water for the GDEs, the Project owner shall prepare a groundwater investigation work plan for submittal to the CPM that will outline steps to determine if the source of water for the GDEs is regional groundwater and not a shallow water-bearing zone unrelated to the regional water table. The groundwater investigation will be comprised of the following components:

    a. A continuous soil coring program at five locations to be indentified based on field mapping of GDEs in the area shown on the Figure *Soil and Water-3 (Project Only Revised Operational Water Supply End of 30 Years)* within the 0.1-foot drawdown polygon of the Model Predicted Drawdown (Galati & Blek 2010i). One of the five borings will be drilled adjacent to a GDE containing mesquite, and the other four located to provide an assessment of the range of plant communities within GDEs in the area of interest (i.e., to assess the variability of GDE plant type water requirements and root zone depth).

    b. The soil cores shall extend a minimum of 20 feet below the root zones of the GDEs investigated to demonstrate separation between the shallow and regional water zones. At a minimum the soil cores shall show that 20 feet of unsaturated conditions are present below the root zones of the plant communities investigated. The soil cores will be logged by a professional geologist in the State of California, and the coring program will be overseen by a qualified biologist with experienced in the plant communities identified within each GDE.

    c. A sampling plan for selective analysis of soil moisture content and saturation will also be conducted for each soil core advanced adjacent to a GDE. The number and frequency of soil samples shall be established to confirm field observations of soil moisture content in the shallow water-bearing zone, through the root zone and in the deeper

sediments below the root zone above the regional water table. Soil samples shall be analyzed for moisture content after ASTM Method D2216.

d. Depending on the results of the soil coring program, piezometers may be installed as monitoring points for the regional water table and to monitoring changes in the shallow water-bearing zone from Project pumping. In the report of results from the soil coring program, a water-level monitoring program shall be proposed if it is shown that the regional water table is the source of water to the GDE's. If the field data clearly shows separation of 20 feet or more, then piezometers will not be installed.

If the results of the field observations and soil sampling demonstrate 20 feet or more of separation between the shallow water-bearing sediments and the regional water table, there will be no requirements to implement any of the underlying conditions as provided for in BIO-23 and BIO-24, as sufficient evidence will have been provided to demonstrate that the groundwater is not the source for the GDE's.

Verification: ~~No more than 45 days following the docketing of the Energy Commission Final Decision~~ At least 30 days prior to operation of project pumping wells, the Project owner shall submit to the CPM and BLM for review and approval a draft Groundwater-Dependent Vegetation Monitoring Plan (Plan). ~~and the resumes of proposed peer reviewers~~ The final plan ~~draft, which~~ shall incorporate recommendations from the peer review and shall be submitted to the CPM and BLM no less than 15 days prior to the start of groundwater pumping.

No less than 15 days prior to the start of groundwater pumping the Project owner shall submit as-built drawings indicating the location and depth of piezometers, and shall provide evidence that the piezometers are operational.

Baseline groundwater and groundwater-dependent vegetation monitoring shall begin 15 days prior to construction ~~no later than March 1st following docketing of the Energy Commission Final Decision~~ and shall occur every year during the same one to two week time period in early spring (March) and post-monsoon (September).

The First Annual Monitoring Report shall be provided to the CPM and BLM no later than January 31st following the first year of data collection, and shall include an assessment of whether the sampling design would provide statistically adequate monitoring data and whether modifications to the monitoring design would be needed. If the first Annual Monitoring Report recommends a revised sampling design, the Project owner shall submit the revised Plan to the CPM and BLM no later than March 1st.

Thereafter the Project owner shall submit a Groundwater-Dependent Vegetation Annual Monitoring Report to the CPM and BLM no later than January 31st of each year for the duration of Project operation.

If the project owner elects to prepare a groundwater investigation to determine if the source of the water for the GDEs is regional groundwater, and not a shallow-water bearing zone, the project owner shall submit the resumes of at least two independent, qualified peer reviewers 45 days prior to submittal of the report.

REMEDIAL ACTION AND COMPENSATION FOR ADVERSE EFFECTS TO GROUNDWATER-DEPENDENT BIOLOGICAL RESOURCES

BIO-24 If monitoring detects Project-related adverse impacts to groundwater dependent ecosystems (GDEs), as described in **BIO-23** and the impacts are shown to be the result of a decline in the regional groundwater table due to Project pumping, the Project owner shall determine which well(s) are the source of the adverse impacts and shall implement remedial measures as outlined below. If regional drought, off-site pumping or other activities unrelated to the Project are also contributing to the decline in water table, the Project owner shall only be responsible for the portion of the effect that can be demonstrated to be the result of Project pumping. The remedial measures shall be implemented ~~cease pumping at those well(s). In addition, the Project owner shall prepare and implement a detailed Remedial Action Plan~~ with the objective of restoring the groundwater levels to the baseline described in **BIO-23**, and shall compensate for impacts to GDEs with off-site habitat acquisition or restoration. The Project owner shall do all of the following:

1. Modification and/or Cessation of Pumping: The Project owner shall provide to the CPM evidence based on groundwater monitoring and modeling indicating which wells are likely to be causing adverse impacts to GDEs. The Project owner shall initially modify operation of ~~cease operation of~~ those wells to reduce the offsite drawdown in the areas of the GDEs.

   Remedial Action Plan: The objective of remedial action shall be restoration of the spring groundwater table in the alluvial (shallow) aquifer to baseline levels, as described in **BIO-23**. The Remedial Action Plan shall include one or more of the following measures: 1) Begin rotational operation of the site water supply wells reducing pumping in wells that are the most proximal to the GDEs, 2) reducing the pumping rate in the wells that have been identified as the cause of the drawdown in the area of the GDEs, 3) focus pumping on wells on the southern portion of the project site away from the GDEs 4) cease operation of the well(s) that are the cause of the drawdown. Groundwater water level monitoring shall increase to a frequency necessary to document change and recovery in the drawdown from the changes in the pumping program. ~~1) relocate the Project pumping well to another location where the groundwater-dependent vegetation is no longer within the area of groundwater drawdown, or 2) reduce Project water usage through water conservation methods or new technologies to a level that would restore groundwater levels in the shallow aquifer to the pre-impact levels.~~

The Remedial Action Plan shall include a water level monitoring program of sufficient frequency to document changes in operation of the water supply wells, and demonstrate that the water table has been restored to baseline levels. ~~provide evidence that the proposed measures would restore the spring groundwater table in the alluvial (shallow) aquifer to baseline levels and would help restore healthy ecological functioning in the affected plant communities.~~

~~If installation of a new, relocated well is proposed as remedial action, the Project owner shall identify the proposed location of the new well in relation to phreatophytic communities and shall provide evidence through groundwater modeling that groundwater dependent communities do not occur within the 0.1-foot cone of groundwater drawdown around the well.~~ The Project owner shall use the following guidelines for determining if an ecosystem (or species) is phreatophytic (Brown et al 2007; LeMaite et al 1999; Froend & Loomes 2004):

a. It is not known or documented to depend on groundwater, based on scientific literature or expert opinion (local knowledge can be useful in making a determination as some species' dependence varies by setting);

b. The species are not known to have roots extending over a meter in depth;

c. The community does not occur in an area where the water table is known to be 'near' the surface (relative to the documented rooting depths of the species);

d. The herbaceous or shrub vegetation is not still green and/or does not have a high leaf area late in the dry season (compared to other dry areas in the same watershed that do not have access to groundwater).

2. Compensate for Loss of Ecosystem Function. If the decline in the water table in the alluvial (shallow) aquifer is accompanied by a corresponding decline in plant vigor greater than 20 percent (as described in BIO-23), the Project owner shall compensate for the loss of habitat functions and values in the affected groundwater-dependent ecosystems. The amount of compensation shall be at a 3:1 ratio based on area of affected area, using mapping as described in **BIO-23**. The Project owner shall acquire, in fee or in easement, a parcel or parcels of land that include an amount of groundwater-dependent vegetation that is of the same habitat-type as the community affected (e.g., mesquite woodland, alkali sink scrubs, or microphyll woodland) and of an equal or greater habitat quality. The compensation lands shall be located within the watersheds encompassing the Chuckwalla or Palen valleys. As an alternative to habitat compensation, the Project owner may submit a plan that achieves restoration of lost habitat function and value at another location offsite and within the Chuckwalla Groundwater Basin that contains the same habitats as those affected.

a. Review and Approval of Compensation Lands Prior to Acquisition or retoration. The Project owner shall submit a formal acquisition proposal to the CPM describing the parcel(s) intended for purchase. This acquisition proposal shall discuss the suitability of the proposed parcel(s) as compensation lands in relation to the criteria listed above. Approval from the CPM shall be required for acquisition of all compensatory mitigation parcels.

b. Preparation of Management Plan: The Project owner shall submit to the CPM and CDFG a draft Management Plan that reflects site-specific enhancement measures for the acquired compensation lands. The objective of the Management Plan shall be to maintain the functions and values of the acquired GDE plant communities and may include enhancement actions such as weed control, fencing to exclude livestock, or erosion control.

c. Delegation of Acquisition. The responsibility for acquisition of compensation lands may be delegated to NFWF or another third party other than NFWF, such as a non-governmental organization supportive of desert habitat conservation, by written agreement of the Energy Commission. Such delegation shall be subject to approval by the CPM prior to land acquisition, enhancement or management activities.

Verification: No more than 30 days following submission of the Groundwater Dependent Vegetation Annual Monitoring Report ~~No more than 30 days following submission of the Groundwater-Dependent Vegetation Annual Monitoring Report,~~ the Project owner shall submit to the CPM for review and approval a draft Remedial Action Plan if that report indicates that the threshold for remedial action as described in **BIO-23** has been met. At the same time the Project owner shall submit written evidence that the Project wells responsible for impacts to groundwater levels and GDEs have modified their operation or ~~under~~ ceased operation.

A final Remedial Action Plan shall be submitted to the CPM within 30 days of receipt of the CPM's comments on the draft plan.

No later than 6 months following approval of the final Remedial Action Plan, the Project owner shall provide to the CPM written documentation of the effectiveness of the completed remedial action.

No more than 30 days following submission of the Groundwater-Dependent Vegetation Annual Monitoring Report**,** the Project owner shall provide to the a final accounting of the amount of GDE habitat affected by Project groundwater pumping.

No more than 6 months following submission of the Groundwater-Dependent Vegetation Annual Monitoring Report the Project owner shall submit a formal acquisition or restoration proposal to the CPM, describing the mitigation parcels intended for purchase or restoration. The acquisition/restoration proposal shall describe how the proposed parcels meet the acquisition or restoration criteria described in this condition.

No fewer than 90 days prior to acquisition or restoration of compensatory mitigation lands, the Project owner shall submit to the CPM and obtain CPM approval of any agreements to delegate land acquisition to an approved third party, or to manage compensation lands; such agreement shall be executed and implemented no more than months following approval of the acquisition proposal.

The Project owner shall provide written verification to the CPM that the compensation lands or conservation easements have been acquired and recorded in favor of the approved recipient no later than 18 months from submission of the Groundwater-Dependent Vegetation Annual Monitoring Report.

GOLDEN EAGLE INVENTORY AND MONITORING

BIO-25 The Project owner shall implement the following measures to avoid or minimize Project-related construction impacts to golden eagles.

1. Annual Inventory During Construction. For each calendar year during which construction will occur an inventory shall be conducted to determine if golden eagle territories occur within one mile of the Project boundaries. Survey methods for the inventory shall be as described in the Interim Golden Eagle Inventory and Monitoring Protocols; and Other Recommendations (Pagel et al. 2010) or more current guidance from the USFWS.
2. Inventory Data: Data collected during the inventory shall include at least the following: territory status (unknown, vacant, occupied, breeding successful, breeding unsuccessful); nest location, nest elevation; age class of golden eagles observed; nesting chronology; number of young at each visit; digital photographs; and substrate upon which nest is placed.
3. Determination of Unoccupied Territory Status: A nesting territory or inventoried habitat shall be considered unoccupied by golden eagles ONLY after completing at least 2 full surveys in a single breeding season. In circumstances where ground observation occurs rather than aerial surveys, at least 2 ground observation periods lasting at least 4 hours or more are necessary to designate an inventoried habitat or territory as unoccupied as long as all potential nest sites and alternate nests are visible and monitored. These observation periods shall be at least 30 days apart for an inventory, and at least 30 days apart for monitoring of known territories.
4. Monitoring and Adaptive Management Plan: If an occupied[19] nest is detected within one mile of the Project boundaries, the Project owner shall prepare and implement a Golden Eagle Monitoring and Adaptive Management Plan for the duration of construction to ensure that Project

[19] An occupied nest is one used for breeding by a pair of golden eagles in the current year. Presence of an adult, eggs, or young, freshly molted feathers or plucked down, or current years' mutes (whitewash) also indicate site occupancy. Additionally, all breeding sites within a breeding territory are deemed occupied while raptors are demonstrating pair bonding activities and developing an affinity to a given area. If this culminates in an individual nest being selected for use by a breeding pair, then the other nests in the nesting territory will no longer be considered occupied for the current breeding season. A nest site is considered occupied throughout the periods of initial courtship and pair bonding, egg-laying, incubation, brooding, fledging, and post-fledging dependency of the young.

construction activities do not result in injury or disturbance to golden eagles. The monitoring methods shall be consistent with those described in the Interim Golden Eagle Inventory and Monitoring Protocols; and Other Recommendations (Pagel et al. 2010) or more current guidance from the USFWS. The Monitoring and Management Plan shall be prepared in consultation with the USFWS. Triggers for adaptive management shall include any evidence of Project-related disturbance to nesting golden eagles, including but not limited to: agitation behavior (displacement, avoidance, and defense); increased vigilance behavior at nest sites; changes in foraging and feeding behavior, or nest site abandonment. The Monitoring and Adaptive Management Plan shall include a description of adaptive management actions, which shall include, but not be limited to, cessation of construction activities that are deemed by the Designated Biologist to be the source of golden eagle disturbance.

Verification: No fewer than 30 days from completion of the golden eagle inventory the project owner shall submit a report to the CPM, BLM, CDFG, and USFWS documenting the results of the inventory.

If an occupied nest is detected within one mile of the Project boundary during the inventory the Project owner shall contact staff at the USFWS Carlsbad Office and CDFG within one working day of detection of the nest for interim guidance on monitoring and nest protection. The project owner shall provide the CPM, CDFG, and USFWS with the final version of the Golden Eagle Monitoring and Management Plan within 30 days after detection of the nest. This final Plan shall have been reviewed and approved by the CPM in consultation with USFWS and CDFG.

EVAPORATION POND NETTING AND MONITORING

BIO-26 The Project owner shall cover the evaporation ponds prior to any discharge with 1.5-inch mesh netting designed to exclude birds and other wildlife from drinking or landing on the water of the ponds. Netting with mesh sizes other than 1.5-inches may be installed if approved by the CPM in consultation with CDFG and USFWS. The netted ponds shall be monitored regularly to verify that the netting remains intact, is fulfilling its function in excluding birds and other wildlife from the ponds, and does not pose an entanglement threat to birds and other wildlife. The ponds shall include a visual deterrent in addition to the netting, and the pond shall be designed such that the netting shall never contact the water. Monitoring of the evaporation ponds shall include the following:

1. Monthly Monitoring. The Designated Biologist or Biological Monitor shall regularly survey the ponds at least once per month starting with the first month of operation of the evaporation ponds. The purpose of the surveys shall be to determine if the netted ponds are effective in excluding birds, if the nets pose an entrapment hazard to birds and wildlife, and to assess the structural integrity of the nets. The monthly survey shall be conducted in 1 day for a minimum of 2 hours following sunrise (i.e., dawn), a minimum of 1 hour mid-day (i.e., 1100 to 1300), and a minimum of 2 hours preceding sunset (i.e., dusk) in order to provide an accurate assessment

of bird and wildlife use of the ponds during all seasons. Surveyors shall be experienced with bird identification and survey techniques. Operations staff at the Project site shall also report finding any dead birds or other wildlife at the evaporation ponds to the Designated Biologist within 1 day of the detection of the carcass. The Designated Biologists shall report any bird or other wildlife deaths or entanglements within 2 days of the discovery to the CPM, CDFG, and USFWS.

2. Dead or Entangled Birds. If dead or entangled birds are detected, the Designated Biologist shall take immediate action to correct the source of mortality or entanglement. The Designated Biologist shall make immediate efforts to contact and consult the CPM, CDFG, and USFWS by phone and electronic communications prior to taking remedial action upon detection of the problem, but the inability to reach these parties shall not delay taking action that would, in the judgment of the Designated Biologist, prevent further mortality of birds or other wildlife at the evaporation ponds.
3. Quarterly Monitoring. If after 12 consecutive monthly site visits no bird or wildlife deaths or entanglements are detected at the evaporation ponds by or reported to the Designated Biologist, monitoring, as described in paragraph 1, can be conducted on a quarterly basis.
4. Biannual Monitoring. If after 12 consecutive quarterly site visits no bird or wildlife deaths or entanglements are detected by or reported to the Designated Biologist and with approval from the CPM, USFWS, and CDFG, future surveys may be reduced to 2 surveys per year, during the spring nesting season and during fall migration. If approved by the CPM, USFWS, and CDFG, monitoring outside the nesting season may be conducted by the Environmental Compliance Manager.
5. Modification of Monitoring Program. CDFG or USFWS may submit a request for modifications to the evaporation pond monitoring program based on information acquired during monitoring, and may also suggest adaptive management measures to remedy any problems that are detected during monitoring or modifications if bird impacts are not observed. Modifications to the evaporation pond monitoring described above and implementation of adaptive management measures shall be made only after approval from the CPM, in consultation with USFWS and CDFG.

Verification: No less than 30 days prior to operation of the evaporation ponds the project owner shall provide to the CPM as-built drawings and photographs of the ponds indicating that the bird exclusion netting has been installed. For the first year of operation the Designated Biologist shall submit quarterly reports to the CPM, BLM, CDFG, and USFWS describing the dates, durations and results of site visits conducted at the evaporation ponds. Thereafter the Designated Biologist shall submit annual monitoring reports with this information. The quarterly and annual reports shall fully describe any bird or wildlife death or entanglements detected during the site visits or at any other time, and shall describe actions taken to remedy these problems. The annual report shall be submitted to the CPM, BLM, CDFG, and USFWS no later than January 31st of every year for the life of the project.

REVEGETATION & RESTORATION OF TEMPORARILY DISTURBED AREAS

BIO-27 The Project owner shall prepare and implement a Revegetation and Restoration Plan to restore all areas subject to temporary disturbance according to the specifications and performance standards in this condition. Areas considered subject to temporary disturbance shall include but are not necessarily limited to the following Project facilities: Gen-tie transmission line; telecommunications service line; temporary construction power line; relocation of the Blythe Eagle Mountain 161kv Line alignments; secondary access road, and any temporary access roads or road improvements (widening) associated with these Project facilities. This condition shall also be applied to staging and laydown areas, as well as any other areas subject to soil disturbance during construction outside of the permanent Project Disturbance Area (the solar facility and primary access road). The cut banks and embankments around the facility and the engineered channel are not included in this measure; these features shall instead be treated with the erosion control measures specified in **Soil & Water-11**. Restoration and revegetation of the solar facility and other permanently disturbed areas upon decommissioning is addressed separately in **BIO-22.** During implementation of this condition, the Project owner shall comply with all other measures for avoiding impacts to biological resources (see **BIO-7** and **BIO-8**) and with the terms and conditions of the seed collecting permit required by BLM.

The Plan shall incorporate all of the guidelines, specifications and performance standards below.

A. Revegetation Goals: 1) restore all temporarily disturbed areas to established, self-sustaining, climax stages of the affected native plant communities; 2) prevent aggressive recolonization of disturbed areas by Sahara mustard and other highly invasive or ecologically destructive non-native pest plants; 3) minimize wind erosion of disturbed soil; 4) minimize soil disturbance; 5) promote natural processes of restoration to minimize the loss of carbon sequestration and other ecological benefits of biotic soil crusts, and 7) provide site-specific information on performance of revegetation methods to inform and improve the design of the decommissioning and closure restoration plan.

To accomplish these goals, the condition objectives are to: 1) design and construct the linears to minimize soil disturbance; 2) preserve native topsoil and biotic soil crusts; 3) use only locally collected seed, and 4) manage and control Sahara mustard and other invasive plants that interfere with natural succession and restoration.

B. Prepare Draft Revegetation Plan. The Project owner shall submit a draft Revegetation Plan (Plan) that, at a minimum, incorporates all of the guidelines, specifications and performance standards contained in this condition. The Plan shall also provide: 1) cost estimate, timeline and work plan for the implementation phase; 2) cost estimate, timeline and work plan for long-term maintenance and monitoring; 3) sample maintenance and

monitoring data sheets; 4) a map showing the location of the monitoring plots and the techniques used to permanently mark and relocate the plots in the field; 5) details of the implementation, maintenance and monitoring; 6) the names and qualifications of the person(s) preparing the Plan and that will conduct and or oversee the data collection, and 7) contact information for the responsible parties, including the name and contact information for the person(s) preparing the Plan and overseeing its implementation.

The Plan shall not include techniques such as hydroseeding, imprinting, jellyrolling, container plantings, etc., because currently they are either untested, or have performed poorly in this particularly hot and dry region of the California desert. Techniques for revegetation/restoration not included in this condition may be considered if they can be demonstrated to not interfere with natural processes for restoration, destroy topsoil or beneficial soil organisms/soil crusts, or promote aggressive weed growth. Some techniques, such as direct plantings of native shrubs, have shown success[20] [21] and may be included to enhance the revegetation techniques required in this condition. Non-local seed, or plants propagated from non-local seed sources, shall not be used.

C. Pre-Construction Planning, Avoidance & Minimization. The Project shall minimize the area of soil disturbance as prescribed below. Sensitive biological resources that occur within or adjacent to the treated area shall be protected according to the avoidance and minimization measures contained in other conditions of certification (**BIO-7, -8, -9, -14, -15, -17, -18, -19** (Section A), **-20**, and **-21**). The Project owner shall implement the following measures:

1) Map Requirements: Prepare a detailed map at a scale consistent with the grading plans that identifies each of the following resources wherever they occur within 100 feet of the Project Disturbance Area: a) existing disturbed areas; b) sensitive habitats and resources (washes, desert wash woodland, dunes, playas, and rare plant populations); c) areas of high quality, undisturbed creosote bush scrub; d) the locations of the 'control' plots (disturbed plots where no treatment shall be applied [see subsection F]), and e) populations of Sahara mustard and any other highly invasive non-native plants, ranked by density and/or biomass and seed production[22]. Clearly depict on the map where grading for temporary access can be avoided, and where it cannot.

2) Minimize Disturbance. Locate staging areas, laydowns, and temporary parking or storage for linears in existing disturbed areas. Equipment maintenance and refueling shall not be conducted within 100 feet of any

[20] Abella, S.R., and A.C. Newton. 2009. *A systematic review of species performance and treatmenteffectiveness for revegetation in the Mojave Desert, USA.* Pp. 45-74 in Fernandez-Bernal, A., and M.A. De La Rosa (eds.). Arid environments and wind erosion. Nova Science Publishers, Inc., Hauppauge, NY.

[21] Bainbridge, David A., 2007. *A Guide for Desert and Dryland Restoration: New Hope for Arid Lands*. Society for Ecological Restoration International.

[22] Trader, M.R., Brooks, M.L., Draper, J.V., 2006. *Seed production by the non-native Brassica tournefortii (Sahara mustard) along desert roadsides.* In: Madrono: v53; 313–320.

sensitive resource. Limit the width of the work area to a bare minimum. Avoid blading access roads and instead drive over and crush the vegetation to preserve the seed bank.

3) Avoid Sensitive Areas. Avoid sensitive areas through modification to the site design or construction techniques. Adjust the locations of poles and laydown areas, and the alignment of the roads and pipelines to avoid environmentally sensitive areas. Construction drawings and grading plans shall depict the locations of pole sites relative to sensitive resource and demonstrate where temporary impacts to sensitive resources can be avoided and where they cannot.

4) Avoid Spreading Weeds. Avoid spreading weeds to uninfested areas by flagging and avoiding dense populations of the most invasive non-native weeds or species likely to interfere with the success of the restoration, such as Sahara mustard and Russian thistle. If these areas cannot be avoided, they shall be pre-treated by the methods described in **BIO-14** (Weed Management Plan).

5) Identify Topsoil Salvage and Storage Sites. Identify the locations of topsoil salvage sites and temporary soil storage sites. The native topsoil shall be salvaged in all areas that will be temporarily disturbed, excluding: 1) temporary access roads where blading can be avoided by just driving over and crushing vegetation, and 2) areas moderately to heavily infested with invasive weeds. The topsoil shall be temporarily stored in existing disturbed areas. The native topsoil shall be salvaged and stored according to the detailed specifications in subsection D, below.

C. Pre-Construction Seed Collection.

1) BLM Seed Collection Permit. The Project owner shall coordinate with BLM to obtain a permit for seed collection and shall begin seed collection in immediately upon BLM approval of the permit application, and shall comply with all terms and conditions of the permit.

2) Qualified Specialist for Seed Collection. The Project owner shall coordinate with a qualified specialist, such as the Rancho Santa Ana Botanical Garden Seed Conservation Program, San Diego Natural History Museum, Missouri Botanical Garden, or a private seed dealer to conduct or oversee the collection. Seed collection and storage shall be consistent with, or informed by, guidelines such as those contained in: 1) CALTRANS: Native Seed collection, processing, and storage for revegetation projects (Fidelibus & Mac Aller 1993)[23]; 2) Rancho Santa Ana Botanic Garden: Seed Collection Guidelines for Native Plant Species[24] (Wall 2009a), 3) Rancho Santa Ana

[23] Fidelibus, M.W and R.T.F. Mac Aller. 1993. *Native Seed collection, processing, and storage for revegetation projects*. Prepared for the California Department of Transportation. San Diego State University, Biology Department. San Diego, CA. Online: http://www.sci.sdsu.edu/SERG/techniques/native.html

[24] Wall, M. 2009a. *Seed Collection Guidelines for Native Plant Species*, Rancho Santa Ana Botanic Gardens, October 27. Online: http://www.rsabg.org/horticulture/seedprogram/SeedCollectionGuidelines2009.pdf

Botanic Garden: Seed Storage Guidelines for Native Plant Species [25] (Wall 2009b).

3) Seed Sources. Only locally collected seed may be used. Commercial seed is acceptable only if it was collected within the Chuckwalla Hydrologic Unit (HUs), or adjacent watersheds. Native plant seed shall be collected from the Project Disturbance Area and used to enhance the natural seed bank contained in the salvaged topsoil, and areas where topsoil is not available. In years of low seed output or viability, it may be necessary to collect off the Project site in adjacent habitats but only hand collecting methods shall be used off-site.

4) Seed Collection Techniques. Seed shall be collected by a combination of mechanical and hand collection methods. Techniques such as vacuum-sweeping the soil surface under shrubs has been successful; shrubs support an understory of desert annuals and short-lived perennials. In addition to providing a range of species of varying dormancy, the leaf litter and chaff harvested by mechanical methods can provide valuable organic matter for use in the revegetation. Collection between shrubs shall also be included to capture the seed of desert annuals and perennials that thrive in the interspaces between shrubs. Collection by vacuum –sweeping shall not occur in areas heavily infested by Sahara mustard or other invasive weeds. Seed shall be collected separately from each of the habitat types affected (creosote scrub, stabilized dunes, and washes), and stored and sown separately. Extra seed shall be collected from locally native annuals and perennials which have demonstrated an ability to reduce the invasibility of desert ecosystems by invasive weeds. [26]

5) Seed Quantity and Application. The total amount of bulk seed collected shall be a quantity sufficient to ensure an approximate application rate of 10 pounds live seed per acre. Approximately 10 percent of the total shall consist of species with an ability to reduce invasibility by Sahara mustard and other invasives (ibid). If not used immediately, the seed shall be stored with a qualified facility and the Project owner is responsible for all costs associated with the seed collection, storage, processing, etc.

D. Salvaging, Storing and Re-Applying Topsoil. The goal of the soil salvage is to: a) capture the seed bank, biotic soil crust and other soil organisms store and replace the soil in a way that maintains the viability of

[25] Wall, M. 2009b. *Seed Storage Guidelines for Native Plant Species, Rancho Santa Ana Botanic Gardens*, October 27. Online: http://www.rsabg.org/horticulture/seedprogram/SeedStorageGuidelines2009.pdf

[26] Abella et al. 2010. *Relationships of Native Desert Plants with Red Brome (Bromus rubens): Towards Identifying Invasion-Reducing Species.* University of Nevada Las Vegas, Las Vegas, NV. Also various electronic communications between Scott Abella and staff, and Carolyn Chainey-Davis, California Energy Commision, August 2010, regarding species that have shown an ability to reduce invasion by Sahara mustard. Examples of such species that are also known to occur include: flat-topped buckwheat (*Eriogonum deflexum*); cleft-leaf wild heliotrope (*Phacelia crenulata*) pincushion (*Chaenactis stevioides*); bristly fiddleneck (*Amsinckia tessellata*); sweetbush (*Bebbia juncea*), and brittlebush (*Encelia farinosa*).

the seed and soil organisms. Topsoil shall also be salvaged from the Project site, in phases according to the Phasing Plan in **BIO-29.**

1) Salvage the upper 1-2 inches of topsoil. Depths greater than 1 to 2 inches will significantly reduce the amount of viable native seed in the soil by burying it too deeply; most seed is contained in the upper ½ inch of soil[27]. This may require the use of a harrow, rather than an excavator bucket, to harvest a thin layer off the soil surface. The upper layer of soil containing the seed bank and biotic soil crust shall be stockpiled where it will not be impacted by other grading, flooding, erosion, or pollutants. Install temporary construction fencing and signage as "Environmentally Sensitive Area: Topsoil for use only in revegetation" to ensure that it is not inadvertently used for fill material. If the soil is to be stored more than 2 weeks it must be spread out to a depth of no more than 6 inches to avoid killing the seed and beneficial soil organisms. Long-term storage and mixing of upper and lower layers has been shown to significantly reduce the amount of viable seed; however, topsoil that is harvested correctly and returned soon after collection has been found to make a significant contribution to species richness in reapplication areas (Scoles-Sciulla & DeFalco 2009).

2) Excavate subsoil layers. After carefully removing the topsoil, then excavate the next 6 to 8 inches of soil and stockpile where it will not be impacted by other grading, flooding, erosion, or pollutants. The subsoil layers do not need to be spread out and can be stored in piles. Fence and sign the piles as "Environmentally Sensitive Area: Topsoil for use only in revegetation".

3) Refill the bladed, trenched or excavated areas in the reverse order of stockpiling, First replace the 6-8 inch layer of subsoil. Aafter mixing the seed with the upper layer of topsoil spread the topsoil and seed mix very gently and very thinly to ensure that there is enough topsoil to thinly spread over all disturbed areas (excluding those that were only driven over). This may require using a harrow or similar equipment to thinly distribute the layer to depths no greater than 1 to 2 inches. In all areas where revegetation will occur (all areas except permanent roads and the solar facility), minimize soil compaction to less than 80% ASTM [28]standards to maintain soil permeability, maximize root penetration, and retain soil gas exchange potential.

E. Maintenance. Maintenance of the treated areas shall consist of: 1) weed control; 2) protection from unauthorized ORV, and 3) protection from herbivores. The maintenance shall extend for a period of 10 years following installation of the revegetation.

1) Control Weeds in Treated Areas. The Project owner shall consult knowledgeable sources in the preparation of the Plan to devise a

[27] Scoles-Sciulla, S. J. and L. A. DeFalco. 2009. *Seed Reserves Diluted During Surface Soil Reclamation in Eastern Mojave Desert*. In: Arid Land Research and Management 23:1-13.

[28] American Society for Testing and Materials (ASTM).

management strategy for minimizing invasive species in treated areas.[29] [30] Weed control shall focus on prevention, early detection of new infestations, and early eradication to meet the performance standards described in subsection F, below. Weed monitoring shall occur a minimum of once per year, for a total 10-year monitoring and maintenance period. Monitoring shall be conducted during the early spring months (March-April) to detect seedlings before they set seed. The focus shall be on new invaders or highly invasive species with the potential to interfere with revegetation success, such as Sahara mustard. Non-native species with low ecological risk, or that are very widespread, such as Mediterranean grass, shall be noted but control is not required. When detected, infestations of high priority species shall be eradicated immediately, using only manual methods, and according to guidance obtained from the staff at University of Nevada, Las Vegas (UNLV) and other knowledgeable sources.

2) Prevent Damage to Revegetated Areas from ORV Use. Treated areas with any prior unauthorized use by ORV, and any new temporary construction roads that could be used by ORVs, shall install vertical mulching at the head of the road to prevent damage to the revegetation; boulder barricades and gates are not acceptable unless the remainder of the site is fenced (to prevent driving around the gate or barricade). The Project owner shall use only contractors with demonstrated experience in this vertical mulching. Designated ORV routes and roads shall not be closed.

3) Protection Treated Areas from Damage by Herbivores. Narrow, linear treated areas are far more vulnerable to the impacts of natural herbivores than large treated areas. To improve success (and eliminate costly re-applications), the Project owner shall install rodent netting or temporary fencing wherever feasible to protect seedlings during the vulnerable stages, or to provide tree shelters for the harder-to-establish woody species.

4) Supplemental Irrigation to Promote Creosote Bush Establishment. Supplemental irrigation from a water truck carries a high risk of promoting rank weed growth and is not recommended (Abella & Newton 200931). As an alternative to labor- and cost-intensive container plantings, the Project owner may include the following drip irrigation technique, or other techniques for increasing the establishment of creosote and other native woody shrubs, and to enhance the Project's ability to meet the performance standards described in this condition (subsection G): drip

[29] Craig, D.J., J.E. Craig, S.R. Abella, and C.H. Vanier. 2010. *Factors affecting exotic annual plant cover and richness along roadsides in the eastern Mojave Desert, USA*. Journal of Arid Environments (in press).

[30] Abella, S.R., Spencer, J.E., Hoines, J., Nazarchyk, C., 2009. *Assessing an exotic plant surveying program in the Mojave Desert, Clark County, Nevada, USA.* Environmental Monitoring and Assessment 151, 221–230.

[31] Abella, S.R., and A.C. Newton. 2009. *A systematic review of species performance and treatment effectiveness for revegetation in the Mojave Desert, USA.* Pp. 45-74 in Fernandez-Bernal, A., and M.A. De La Rosa (eds.). Arid environments and wind erosion. Nova Science Publishers, Inc., Hauppauge, NY.

irrigation, run periodically through the fall/winter season has been successful in stimulating the germination of creosote bush seed already present in the soil (Silverman pers.comm.). Irrigation is applied only for the first fall to simulate the episodic germination of creosote bush following particularly wet summer/fall rains. The lines can be charged by the Project wells (if in close proximity), or by truck-mounted water tanks (pressurized). The lines, if installed, shall be monitored for damage and repairs made immediately. Other successful techniques for establishing slow-growing woody species that may be included in the Plan are described in Bainbridge (2007).[32]

F. Monitoring. The goal of the monitoring is to collect data to determine whether the revegetation is meeting the performance standards described in this condition (see subsection G, below) for weed control, density, cover, species diversity, and increasing similarity to the climax or late-successional (undisturbed) conditions in the reference plots. The results of the annual monitoring shall be included in the Annual Monitoring Report (see Section H, below). The analysis shall include 1) before-after comparisons *and* 2) control-impact comparisons. Because of the variation in vegetation types, successional status, and level of disturbance along all the linears, the monitoring and sampling design shall treat each corresponding reference plot as a pair (versus comparing the mean of all treatment plots to the mean of all control plots).

1) Conduct Baseline (Pre-Disturbance) Monitoring. Baseline monitoring shall be conducted in the following areas: 1) areas to be disturbed; 2) undisturbed reference sites outside the disturbance zone, and 3) areas that will be disturbed but not treated as control plots. The Project owner shall conduct pre-construction baseline data collection for a minimum of one year, and post-construction data collection of the same plots (therein referred to as the "Treatment Plots"), "Reference Plots", and untreated controls, according to the following schedule: Annually for the first two years and then every other year, for a total of 10 years, or until the project meets the performance standards described below.

2) Post-Disturbance Monitoring shall be conducted in all three areas described above for a pre-disturbance and post-disturbance comparison and an impact-control comparison.

3) Location, Size, and Shape of Plots. Monitoring plots shall be located using a stratified random sampling approach, with plots stratified by natural community type and/or landform, such as partially stabilized dunes versus sand fields, and the sampling points (plots and/or transects) randomly selected within each section. The untreated control plots shall also be interspersed among the treated plots, based on the same approach to locating the plots. Because the disturbed areas are predominantly linear, the

[32] Bainbridge, David A., 2007. *A Guide for Desert and Dryland Restoration: New Hope for Arid Lands*. Society for Ecological Restoration International.

grid-cell method has been recommended for randomly positioning the established minimum number of plots (Elzinga et al. 1998)[33]. Line or point transects have been recommended for collecting data on total (absolute) and relative plant cover and density (*ibid*.). Information on the existing type of disturbance (e.g., hydrologic, topographic), and the estimated cause and year of disturbance shall also be noted and quantified (see CNPS releve protocol and field forms for quantifying disturbances[34]). No performance standards are established for annuals because they are too variable and rainfall-dependent but visual estimates of their cover shall be noted

4) Reference Plots. The reference plots shall be located adjacent to the treatment plots but far enough away (e.g., 100 feet) to avoid accidental impacts during construction and potential indirect effects. It is more important that the reference plot be comparable than close. It may be useful to select the plots in winter independent of the effects of a variable and unpredictable climate on cover, etc.

The number of plots/transects sampled shall be established by a power analysis[35] to determine an appropriate sample size to achieve a minimum 90 percent statistical power with a false-change error rate of 10 percent.

G. Performance Standards. Because the long-term goal of revegetation is to establish self-sustaining climax or late-successional stages of the affected native plant communities, performance standards in this condition shall be based on an ever-increasing similarity of the treated plots to the late-successional (and undisturbed) reference plots, using Jaccard's Index of Similarity to determine the degree of similarity between the undisturbed reference plots and the revegetated treatment plots.

The revegetation shall also be evaluated in the context of how quickly the treatments accelerated the recovery of perennial cover in comparison to what would happen naturally without intervention. Annuals shall not be used to evaluate performance; even though they are strongly associated with both early and late successional stages; the cover of annuals fluctuates widely in response to a variable and unpredictable climate. Nor shall performance be based on the cover or density of early colonizers in long-lived stable communities like creosote scrub; although these perennials increase quickly after disturbance, they are short-lived and will ultimately be replaced by longer-lived, later-successional species.

"Density" shall be defined as the number of individual perennial plants per unit area. "Diversity" shall be defined as the number of different perennial species per unit area. The 10-year goal for diversity shall be 15 percent,

[33] Elzinga, C.L., D.W. Salzer, and J.W. Willoughby. 1998. *Measuring and monitoring plant populations*. BLM Technical Reference 1730-1, Denver, Co. See Appendix 16-18 on estimating sample sizes.
[34] California Native Plant Society (CNPS) Vegetation Program. Vegetation sampling protocol and field forms. Online: http://www.cnps.org/cnps/vegetation/protocol.php
[35] Elzinga, C.L., D.W. Salzer, and J.W. Willoughby. 1998. *Measuring and monitoring plant populations.* BLM Technical Reference 1730-1, Denver, Co. See Appendix 16-18 on estimating sample sizes.

expressed as a similarity index of the reference plots. The 5-year goal for diversity, based on a sigmoidal curve, shall be a 4 percent similarity index. The 10-year goal for density, using only native perennial species, will be 21 percent as compared to the undisturbed reference sites. The 5-year goal for density shall be 6 percent of the control.

H. Monitoring Reports. Annual monitoring reports shall be submitted to the CPM that include, at a minimum: a) names and contact information for the responsible parties and monitoring personnel; c) summaries of the results of the monitoring, as described under subsection F of this condition; d) summary of the progress toward meeting the performance goals (subsection G) in a comparison of treatment plots with reference plots; e) comparison between the treated plots and the untreated controls; f) copies of the data sheets; g) photos, and h) conclusions, including recommendations for remedial action.

I. Contingency. If the treated areas fail to meet the performance standards described in subsection G any given monitoring year, the Project owner shall submit a contingency plan that describes, in detail, the causes of failure and the recommended remedial measures. Subject to review and approval by the CPM, the remedial action may include alternative methods such as imprinting, container planting, jelly-rolling or any new techniques with a proven record of success in the Sonoran or Mojave Desert regions of California. The Project owner shall consult recognized experts in arid lands restoration at UNLV, University of California, Riverside or other non-commercial sources, in the preparation of the remedial action Plan.

Delegation of the Maintnenance and Monitoring to a Third Party. The responsibility for 10-year maintenance and monitoring requirement may be delegated to NFWF or another third party, subject to the approval of the CPM. The third party would be responsible for meeting the performance standards described in subsection G and all maintenance, monitoring, and reporting requirements. If this option is selected, the Project shall deposit funds into a Renewable Energy Action Team (REAT) subaccount established with the National Fish and Wildlife Foundation (NFWF). Actual costs shall be developed in consultation with the CPM and NFWF. The Project owner shall be responsible for providing adequate funding to complete all maintenance and monitoring tasks described in this condition and additional measures as needed to ensure that the performance standards are met, including contingency measures. The Project owner shall also provide sufficient funding for any administrative fees that NFWF may require to implement the measures described in this condition. The Project owner shall provide financial assurances to the CPM with copies of the document(s) to NFWF to guarantee that an adequate level of funding is available to implement the mitigation measures described in this condition.

Mitigation Security. Prior to the start of ground-disturbing Project activities, the Project owner shall provide financial assurances to the CPM to guarantee that an adequate level of funding is available to implement the revegetation

~~and monitoring required by this condition. Financial assurances shall be provided to the CPM in the form of an irrevocable letter of credit, a pledged savings account or another form of security ("Security") and approved by the CPM. The amount of the Security shall be based on the budget and cost estimate for the revegetation and monitoring submitted with the draft Plan. The CPM may draw on the Security if the CPM determines the Project owner has failed to comply with the requirements specified in this condition. The CPM may use money from the Security solely for implementation of the requirements of this condition. The CPM's use of the Security to implement measures in this condition may not fully satisfy the Project owner's obligations under this condition, and the Project owner remains responsible for satisfying the obligations under this condition if the Security is insufficient. The unused Security shall be returned to the Project owner in whole or in part upon successful completion of the associated requirements in this condition.~~

~~**Verification:** No less than 90 days prior to construction-related ground-disturbance activities the Project owner shall submit to the CPM and BLM a draft Revegetation and Restoration for review and approval by the CPM. The revised and final Plan shall be submitted to the CPM and BLM no less than 30 days prior to construction-related ground-disturbance activities.~~

~~No less than 30 days prior to construction-related ground-disturbance activities the Project owner shall provide to the CPM financial assurance for implementation of the revegetation and monitoring described in this condition.~~

~~No less than 30 days prior to construction-related ground-disturbance activities for each phase as described in **BIO-29**, the Project owner shall submit to the CPM and BLM the final grading plans depicting each of the resources or areas described in subsection C.1~~

~~The Project owner shall provide the CPM a copy of the approved BLM seed collection permit within 5 working days of receipt of the permit.~~

~~Annual monitoring reports shall be submitted to the CPM and BLM according to the reporting schedule in the Revegetation Plan and submitted no later than January 31st of each monitoring year. The content of the report shall include all of the components described in Section H of this condition.~~

IN-LIEU FEE MITIGATION OPTION

BIO-28 The Project owner may choose to satisfy its mitigation obligations by paying an in-lieu fee instead of acquiring compensation lands, pursuant to Fish and Game code sections 2069 and 2099 or any other applicable in-lieu fee provision, provided that the Project's in-lieu fee proposal is found by the Commission to the mitigate the impacts identified herein. If the in-lieu fee proposal is found by the Commission to be in compliance, and the Project Owner chooses to satisfy its mitigation obligations through the in-lieu fee, the Project Owner shall provide proof of the in-lieu fee payment to the CPM prior to construction related ground disturbance.

Verification: If electing to use this provision, the Project owner shall notify the Commission and all parties to the proceeding that it would like a determination that the Project's in-lieu fee proposal would mitigate for the impacts identified herein. Prior to construction related ground disturbance the Project Owner shall provide proof of the in lieu fee payment to the CPM.

PROJECT CONSTRUCTION PHASING PLAN

BIO-29 The Project Owner shall provide compensatory mitigation for the total Project Disturbance Area and may provide such mitigation in two phases for Units 1 and 2 as described in Figures BIO-5 and BIO-6 in the July 19, 2010 Response to Data Request (AECOM 2010u). For purposes of this condition, the Project Disturbance Area means all lands disturbed in the construction and operation of the Palen Project or its phases, including all linears and ancillary facilites, as well as undeveloped areas inside the Project's boundaries that would no longer provide viable long-term habitat.

The disturbance area for each project Phase and resource type is provided in Table 1 ~~the tables~~ below. Mitigation is shown in Table 2 below. This table shall be refined prior to the start of each construction phase with the disturbance area adjusted to reflect the final Project footprint for each phase. Prior to initiating each phase of construction the Project owner shall submit the actual construction schedule, a figure depicting the locations of proposed construction and amount of acres to be disturbed. Mitigation acres are calculated based on the compensation requirements for each resource type as described in the above conditions of certification – **BIO-12** (Desert Tortoise), **BIO-20** (Mojave Fringe-toed Lizard), **BIO-18** (Western Burrowing Owl), and **BIO-22** (State Waters). Compensatory mitigation for each phase shall be implemented according to the timing required by each condition.

Verification: The Project owner shall not disturb any area outside of the area that has been approved for that phase of construction and for the previously approved phases of construction.

No less than 30 days prior to the start of desert tortoise clearance surveys for each phase, the Project owner shall submit a description of the proposed construction activities for that phase to CDFG, USFWS and BLM for review and to the CPM for review and approval. The description for each phase shall include the proposed construction schedule, a figure depicting the locations of proposed construction, and amount of acres of each habitat type to be disturbed.

No less than 30 days prior to beginning Project ground-disturbing activities for each phase, the Project owner shall provide the form of Security in accordance with this condition of certification in the amounts described in **Table 3** (below). No later than 7 days prior to beginning Project ground-disturbing activities for each phase, the Project owner shall provide written verification of the actual Security. The Project owner, or an approved third party, shall complete and provide written verification of the proposed

compensation lands acquisition within 18 months of the start of Project ground-disturbing activities for each phase.

Table 1. Area of Habitat Type Disturbed by Construction Phase (acres)[1]

Habitat Type	Reconfigured Alternative 2 Disturbance Area		Reconfigured Alternative 3 Disturbance Area	
	Phase 1	**Phase 2**	**Phase 1**	**Phase 2**
MFTL Habitat				
Stabilized & Partially Stabilized Dunes	44	112	59	128
Non-Dunes	637	711	509	845
Indirect Impacts[2]	0	135	0	115
TOTAL	**681**	**957**	**568**	**1089**
DT Habitat				
DT Habitat - inside critical habitat[3]	225	0	225	0
DT Habitat - outside critical habitat	2115	1855	1969	1933
TOTAL[4]	**2340**	**1855**	**2194**	**1933**
WBO Habitat				
Impacts to 4 WBO	4 WBO	0	4 WBO	0
TOTAL	4 WBO	**0**	4 WBO	**0**
Jurisdictional Waters (Direct Impact)				
Dry Desert Wash Woodland	202	6	193	5
Unvegetated Ephemeral Dry Wash	99	81	95	73
Subtotal	***301***	***87***	***287***	***78***
Jurisdictional Waters (Indirect Impact)				
Dry Desert Wash Woodland	0	0	0	0
Unvegetated Ephemeral Dry Wash	17	2	15	2
Subtotal	***17***	***2***	***15***	***2***
TOTAL WATERS	**317**	**89**	**303**	**80**

1 – Sources: Reconfigured Alternatives 2 and 3 - Solar Millennium 2010l.
2 – Indirect Impacts if the CPM does not approve fencing that allows sand transport thorugh the site.
3 – Impacts to desert tortoise critical habitat are assumed to be wholly within the Phase 1 Project Disturbance Area.
4 – Raven Acres subject to the one-time USFWS Regional Raven Management Program fee are equivalent to the total DT Habitat impact acreages.

Table 2. Mitigation by Habitat Type Disturbed by Construction Phase (acres)[1]

Habitat Type	Mitigation Ratio	Reconfigured Alternative 2 Disturbance Area		Reconfigured Alternative 3 Disturbance Area	
		Phase 1	Phase 2	Phase 1	Phase 2
MFTL Habitat					
Stabilized & Partially Stabilized Dunes	3:1	0	336	178	385
Non-Dunes	1:1	637	711	509	845
Indirect Impacts[2]	0.5:1	0	68	0	58
TOTAL		***637***	***1114***	***687***	***1288***
DT Habitat					
DT Habitat - inside critical habitat[3]	5:1	1127	0	1126	0
DT Habitat - outside critical habitat	1:1	2115	1855	1969	1933
TOTAL		**3242**	**1855**	**3095**	**1933**
WBO Habitat					
Impacts to 4 WBO	19.5 acre/WBO	78	0	78	0
TOTAL		78	**0**	78	**0**
Jurisdictional Waters (Direct Impact)					
Vegetated (Dry Desert Wash Woodland)	3:1	605	18	578	15
Unvegetated Ephemeral Dry Wash	1:1	99	81	95	73
Subtotal		***704***	***99***	***673***	***88***
Jurisdictional Waters (Indirect Impact)					
Vegetated (Dry Desert Wash Woodland)	1.5:1	0	0	0	0
Unvegetated Ephemeral Dry Wash	0.5:1	8	1	8	1
Subtotal		***8***	***1***	***8***	***1***
TOTAL WATERS		**712**	**100**	**680**	**89**

1 – Sources: Reconfigured Alternatives 2 and 3 - Solar Millennium 2010l.
2 – Mitigation for Indirect Impacts if the CPM does not approve fencing that allows sand transport thorugh the site.
3 – Impacts to desert tortoise critical habitat are assumed to be wholly within the Phase 1 Project Disturbance Area.

Table 3. Mitigation Securities by Construction Phase (acres)[1]

Habitat Type	Reconfigured Alternative 2 Security		Reconfigured Alternative 3 Security	
	Phase 1	Phase 2	Phase 1	Phase 2
MFTL Habitat	$1,968,197	$3,439,948	$2,115,886	$3,976,935
DT Habitat	$10,005,202	$5,735,255	$9,550,072	$5,968,772
Raven Fee Impacts[2]	$340,410	$194,775	$324,975	$202,965
WBO Habitat	$250,089	$0	$250,089	$282,522
Jurisdicational Waters	$2,191,999	$310,565	$2,096,486	$282,522
Total	***$14,755,897***	***$9,680,543***	***$14,337,507***	***$10,713,716***

1– Securities (aside from Raven fees) based on REAT Biological Resources Mitigation/Compensation Cost Estimate Calculation Table - July 23, 2010 (REAT 2010). Security amounts may change based on final Project footprint. The final amount shall be determined by an updated appraisal conducted as described in **BIO-12.**

2 – Based on U.S. Fish and Wildlife Service Cost Allocation Methodology for Implementation of the Regional Raven Management Plan, dated July 9, 2010 (USFWS 2010b). Fee calculated at $105/acre for direct project impacts.

STATE OF CALIFORNIA

Energy Resources
Conservation and Development Commission

In the Matter of:	**DOCKET NO. 09-AFC-07**
Application For Certification for the PALEN SOLAR POWER PROJECT	**DECLARATION OF** Jennifer Guigliano

I, Jennifer Gugliano, declare as follows:

1. I am presently employed by AECOM, as a Project Director and Associate Principal.

2. A copy of my professional qualifications and experience is included herewith (Attachment A to Testimony) and is incorporated by reference in this Declaration.

3. I prepared the attached testimony relating to Biological Resources for the Palen Solar Power Project (California Energy Commission Docket Number 09-AFC-07).

4. It is my professional opinion that the attached prepared testimony is valid and accurate with respect to issues that it addresses.

5. I am personally familiar with the facts and conclusions related in the attached prepared testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury, under the laws of the State of California, that the foregoing is true and correct to the best of my knowledge and that this declaration was executed on October 5, 2010.

Jennifer L. Guigliano

STATE OF CALIFORNIA

Energy Resources
Conservation and Development Commission

In the Matter of:	**DOCKET NO. 09-AFC-07**
Application For Certification for the PALEN SOLAR POWER PROJECT	**DECLARATION OF** Angie Harbin-Ireland

I, Angie Harbin-Ireland, declare as follows:

1. I am presently employed by AECOM, as a Senior Biologist.

2. A copy of my professional qualifications and experience is included herewith (Attachment A to Testimony) and is incorporated by reference in this Declaration.

3. I prepared the attached testimony relating to Biological Resources for the Palen Solar Power Project (California Energy Commission Docket Number 09-AFC-07).

4. It is my professional opinion that the attached prepared testimony is valid and accurate with respect to issues that it addresses.

5. I am personally familiar with the facts and conclusions related in the attached prepared testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury, under the laws of the State of California, that the foregoing is true and correct to the best of my knowledge and that this declaration was executed on Oct. 5, 2010.

Angie Harbin-Ireland

PALEN SOLAR POWER PROJECT
CULTURAL RESOURCES
OPENING TESTIMONY

I. Name: Stacey Jordan-Connor

II. Purpose:

My testimony addresses the subject of Cultural Resources associated with the construction and operation of the Palen Solar Power Project (09-AFC-07).

III. Qualifications:

Stacey Jordan-Connor: I am presently employed at AECOM, and have been for the past 1.5 years, and am presently a Senior Archaeologist with that organization. I have a Ph.D. in Anthropology and I have over 10 years of experience in the field of Cultural Resources Management. I prepared or assisted in the preparation of the Cultural Resources section of the AFC as well as the post-filing information, data responses, and supplemental filings. A detailed description of my qualifications is contained in the attached resume.

To the best of my knowledge all referenced documents and all of the facts contained in this testimony are true and correct. To the extent this testimony contains opinions, such opinions are my own. I make these statements and provide these opinions freely and under oath for the purpose of constituting sworn testimony in this proceeding.

IV. Exhibits

In addition to this written testimony, I am sponsoring the following exhibits in this proceeding.

Exhibit 1	**Palen Solar I, LLC's Application for Certification Volumes I & II**, dated August 2009, and docketed on August 24, 2009, Section 5.4, Appendix G.
Exhibit 4	**Palen Solar I, LLC's Data Adequacy Supplement**, dated October 2009, and docketed on October 30, 2009.

Exhibit 7	**New Alternative Approach to Staff Review for Cultural Resources**, dated December 1, 2009, and docketed on December 1, 2009.
Exhibit 8	**Palen Solar I, LLC's Selection of Cultural Resources Evaluation Approach**, dated December 21, 2009, and docketed on December 22, 2009.
Exhibit 11	**Palen Solar I, LLC's Responses to CEC Data Requests Set 1**, dated January 2010, and docketed on January 22, 2010, Responses 104 through 168.
Exhibit 13	**Palen Solar I, LLC's Data Responses to January 7, 2010 CEC Workshop Queries and January 11, 2010 CEC Staff Email Queries with Attachment DR-CR-116a & b (Cultural Resources Impact Blocks)**, dated January 29, 2010 and docketed on February 1, 2010.
Exhibit 15	**Palen Solar I, LLC's Response to January 14, 2010 CEC Workshop Queries**, dated February 2010, and docketed on February 8, 2010.
Exhibit 27	**Palen Solar I, LLC's Initial Comments on the Staff Assessment/ Draft Environmental Impact Statement**, dated May 4, 2010, and docketed on May 4, 2010.

Exhibit 48 **Letter from BLM Inviting CEC Deputy Director T. Obrien to Participate in the Cultural Resources Programmatic Agreement**, dated March 15, 2010, and docketed on August 9, 2010.

Exhibit 49 **CEC's Response to BLM's Invitation to Participate in the Programmatic Agreement Section 106 Consultation for PSPP**, dated August 9, 2010, and docketed on August 10, 2010.

V. Opinion and Conclusions

I have reviewed the Cultural Resource section of the RSA and agree with the conclusions therein. In accordance with the discussions with Staff at the recent workshop, I offer the following modifications to the Conditions of Certification. After further research it was determined that the sites labeled with the "DS" prefix are sites that are not within the PSPP Project Area but are within the Red Bluff Substation and therefore will need to be evaluated by the California Public Utilities Commission (CPUC) when it considers the permitting of the Red Bluff Substation which will be owned and operated by Sothern California Edison (SCE).

I agree that with these modifications, the PSPP will not result in significant Cultural Resource impacts and will comply with all laws, ordinances, regulations and standards (LORS).

For the parties' and Committee's convenience we have included all of the Conditions of Certification in this testimony whether or not we propose modifications.

CUL-1 PREHISTORIC TRAILS NETWORK CULTURAL LANDSCAPE (PTNCL) DOCUMENTATION AND NRHP NOMINATION

The project owner shall contribute to a special fund set up by the Energy Commission and/or BLM to finance the completion of the PTNCL Documentation and Possible NRHP Nomination program presented in the Palen Solar Power Project (PSPP) Revised Staff Assessment (RSA).

The amount of the contribution shall be $35 per acre that the project encloses or otherwise disturbs. Any additional contingency contribution is not to exceed an amount totaling 20% of the original contribution. The contribution to the special fund may be made in installments at the approval of the CPM, with the first installment to constitute 1/3 of the total original contribution amount.

If a project is not certified, or if a project owner does not build the project, or, if for some other reason deemed acceptable by the CPM, a project owner does not participate in funding the PTNCL documentation and possible NRHP nomination program, the other project owner(s) may consult with the CPM to adjust the scale of the PTNCL documentation and possible NRHP nomination program research activities to match available funding. A project owner that funds the PTNCL documentation and possible NRHP nomination program, then withdraws, will be able to reclaim their monetary contribution, to be refunded on a prorated basis.

Verification: No later than 10 days after receiving notice of the successful transfer of funds for any installment to the Energy Commission‘s and/or BLM‘s special PTNCL fund, the project owner shall submit a copy of the notice to the Energy Commission‘s Compliance Project Manager (CPM).

CUL-2 DESERT TRAINING CENTER CALIFORNIA-ARIZONA MANEUVER AREA CULTURAL LANDSCAPE (DTCCL) DOCUMENTATION AND POSSIBLE NRHP NOMINATION

The project owner shall contribute to a special fund set up by the Energy Commission and/or BLM to finance the completion of the Documentation and Possible NRHP Nomination program presented in the PSPP RSA.

The amount of the contribution shall be $25 per acre that the project encloses or otherwise disturbs. Any additional contingency contribution is not to exceed an amount totaling 20% of the original contribution. The contribution to the special fund may be made in installments at the approval of the CPM, with the first installment to constitute 1/3 of the total original contribution amount.

If a project is not certified, or if a project owner does not build the project, or, if for some other reason deemed acceptable by the CPM, a project owner does not participate in funding the DTCCL documentation and possible NRHP nomination program, the other project owner(s) may consult with the CPM to adjust the scale of the DTCCL documentation and possible NRHP nomination program research activities to match available funding. A project owner that funds the DTCCL documentation and possible NRHP nomination program, then withdraws, will be able to reclaim their monetary contribution, to be refunded on a prorated basis.

Verification: No later than 10 days after receiving notice of the successful transfer of funds for any installment to the Energy Commission's and/or BLM's special DTCCL fund, the project owner shall submit a copy of the notice to the CPM.

CUL-3 CULTURAL RESOURCES PERSONNEL

Prior to the start of ground disturbance (includes "preconstruction site mobilization," "ground disturbance," and "construction grading, boring, and trenching," as defined in the General Conditions for this project), the project owner shall obtain the services of a Cultural Resources Specialist (CRS) and one or more alternate CRSs, if alternates are needed. The CRS shall manage all monitoring, mitigation, curation, and reporting activities in accordance with the Conditions of Certification (Conditions).

The CRS shall have a primarily administrative and coordination role for the PSPP. The CRS may obtain the services of Cultural Resources Monitors (CRMs), if needed, to assist in monitoring, mitigation, and curation activities. The project owner shall ensure that the CRS implements the cultural resources conditions providing for data recovery from known historical resources and ensure that the CRS makes recommendations regarding the eligibility for listing in the California Register of Historical Resources (CRHR) of any cultural resources that are newly discovered or that may be affected in an unanticipated manner. No ground disturbance shall occur prior to Compliance Project Manager (CPM) approval of the CRS and alternates, unless such activities are specifically approved by the CPM. Approval of a CRS may be denied or revoked for reasons including but not limited to non-compliance on this or other Energy Commission projects.

Cultural Resources Specialist

The resumes for the CRS and alternate(s) shall include information demonstrating to the satisfaction of the CPM that their training and backgrounds conform to the U.S. Secretary of Interior's Professional Qualifications Standards, as published in Title 36, Code of Federal Regulations, part 61. In addition, the CRS shall have the following qualifications:

1 A background in anthropology and prehistoric archaeology;

2 At least 10 years of archaeological resource mitigation and field experience, with at least 3 of those years in California; and

3 At least 3 years of experience in a decision-making capacity on cultural resources projects, with at least 1 of those years in California, and the appropriate training and experience to knowledgably make recommendations regarding the significance of cultural resources.

Required Cultural Resources Technical Specialists

The project owner shall ensure that the CRS obtains the services of a qualified prehistoric archaeologist to conduct the research specified in **CUL-11** and **CUL-12.** The Project Prehistoric Archaeologist's (PPA) training and

background must meet the U.S. Secretary of the Interior's Professional Qualifications Standards for prehistoric archaeology, as published in Title 36, Code of Federal Regulations, part 61, and the resume of the PPA must demonstrate familiarity with similar artifacts and environmental modifications (deliberate and incidental) to those associated with the prehistoric and protohistoric use of the Chuckwalla Valley. The PPA must meet OSHA standards as a "Competent Person" in trench safety.

The project owner shall ensure that the CRS obtains the services of a qualified historical archaeologist to conduct the research specified in **CUL-13** and **CUL-14**. The Project Historical Archaeologist's (PHA) training and background must meet the U.S. Secretary of Interior's Professional Qualifications Standards for historical archaeology, as published in Title 36, Code of Federal Regulations, part 61.

The resumes of the CRS, alternate CRS, the PPA, and the PHA shall include the names and telephone numbers of contacts familiar with the work of these persons on projects referenced in the resumes and demonstrate to the satisfaction of the CPM that these persons have the appropriate training and experience to undertake the required research. The project owner may name and hire the CRS, alternate CRS, the PPA, and the PHA prior to certification.

Field Crew Members and Cultural Resources Monitors

CRMs and field crew members shall have the following qualifications:

1. A B.S. or B.A. degree in anthropology, archaeology, historical archaeology, or a related field, and one year experience monitoring in California; or
2. An A.S. or A.A. degree in anthropology, archaeology, historical archaeology, or a related field, and four years experience monitoring in California; or
3. Enrollment in upper division classes pursuing a degree in the fields of anthropology, archaeology, historical archaeology, or a related field, and two years of monitoring experience in California.

Verification:

1. Preferably at least 120 days, but in any event no less than75 days prior to the start of ground disturbance, the project owner shall submit the resumes for the CRS, the alternate CRS(s) if desired, the PPA, and the PHA to the CPM for review and approval.
2. At least 65 days prior to the start of data recovery on known archaeological sites, the project owner shall confirm in writing to the CPM that the approved CRS, the PPA, and the PHA will be available for on-site work and are prepared to implement the cultural resources Conditions **CUL-11** through **CUL-15**.
3. At least 10 days prior to a termination or release of the CRS, or within 10 days after the resignation of a CRS, the project owner shall submit the resume of the proposed new CRS to the CPM for review and approval. At the same time, the project owner shall also provide to the proposed new CRS the AFC and all cultural resources documents, field notes, photographs, and other cultural resources materials

generated by the project. If no alternate CRS is available to assume the duties of the CRS, a monitor may serve in place of a CRS so that ground disturbance may continue up to a maximum of 3 days without a CRS. If cultural resources are discovered then ground disturbance will remain halted until there is a CRS or alternate CRS to make a recommendation regarding significance.

4. At least 20 days prior to data recovery on known archaeological sites, the CRS shall provide a letter naming anticipated field crew members for the project and attesting that the identified field crew members meet the minimum qualifications for cultural resources data recovery required by this Condition.
5. At least 20 days prior to ground disturbance, the CRS shall provide a letter naming anticipated CRMs for the project and attesting that the identified CRMs meet the minimum qualifications for cultural resources monitoring required by this Condition.
6. At least 5 days prior to additional CRMs beginning on-site duties during the project, the CRS shall provide letters to the CPM identifying the new CRMs and attesting to their qualifications.

CUL-4 PROJECT DOCUMENTATION FOR CULTURAL RESOURCES PERSONNEL

Prior to the start of ground disturbance, the project owner shall provide the CRS, the PPA, and the PHA with copies of the AFC, data responses, confidential cultural resources documents, and the Revised Staff Assessment (RSA) and RSA Errata for the project. The project owner shall also provide the CRS, the PPA, the PHA, and the CPM with maps and drawings showing the footprints of the power plant, all linear facility routes, all access roads, and all laydown areas. Maps shall include the appropriate USGS quadrangles and maps at an appropriate scale (e.g., 1:2400 or 1" = 200') for plotting cultural features or materials. If the CRS requests enlargements or strip maps for linear facility routes, the project owner shall provide copies to the CRS and CPM. The CPM shall review map submittals and, in consultation with the CRS, approve those that are appropriate for use in cultural resources planning activities. No ground disturbance shall occur prior to CPM approval of maps and drawings, unless such activities are specifically approved by the CPM.

If construction of the project would proceed in phases, maps and drawings not previously provided shall be provided to the CRS, the PPA, the PHA, and CPM prior to the start of each phase. Written notice identifying the proposed schedule of each project phase shall be provided to the CRS and CPM.

Weekly, until ground disturbance is completed, the project construction manager shall provide to the CRS and CPM a schedule of project activities for the following week, including the identification of area(s) where ground disturbance will occur during that week.

The project owner shall notify the CRS and CPM of any changes to the scheduling of the construction phases.

Verification:

1. Preferably at least 115 days, but in any event no less than 60 days prior to the start of ground disturbance, the project owner shall provide the AFC, data responses, confidential cultural resources documents, the Revised Staff Assessment (RSA), and RSA Supplement/Errata to the CRS, if needed, and to the PPA, and the PHA. The project owner shall also provide the subject maps and drawings to the CRS, PPA, PHA, and CPM. Staff, in consultation with the CRS, PPA, and PHA, will review and approve maps and drawings suitable for cultural resources monitoring and data recovery activities.
2. At least 15 days prior to the start of ground disturbance, if there are changes to any project-related footprint, the project owner shall provide revised maps and drawings for the changes to the CRS, PPA, PHA, and CPM.
3. At least 15 days prior to the start of each phase of a phased project, the project owner shall submit the appropriate maps and drawings, if not previously provided, to the CRS, PPA, PHA, and CPM.
4. Weekly, during ground disturbance, a current schedule of anticipated project activity shall be provided to the CRS and CPM by letter, e-mail, or fax.
5. Within 5 days of changing the scheduling of phases of a phased project, the project owner shall provide written notice of the changes to the CRS and CPM.

CUL-5 CULTURAL RESOURCES MONITORING AND MITIGATION PLAN

Prior to the start of ground disturbance, the project owner shall submit to the CPM for review and approval the Cultural Resources Monitoring and Mitigation Plan (CRMMP), as prepared by or under the direction of the CRS, with the contributions of the PPA, and the PHA. The authors‘ name(s) shall appear on the title page of the CRMMP. The CRMMP shall specify the impact mitigation protocols for all known cultural resources and identify general and specific measures to minimize potential impacts to all other cultural resources, including those discovered during construction. Implementation of the CRMMP shall be the responsibility of the CRS and the project owner. Copies of the CRMMP shall reside with the CRS, alternate CRS, the PPA, and the PHA, each CRM, and the project owner‘s on-site construction manager. No ground disturbance shall occur prior to CPM approval of the CRMMP, unless such activities are specifically approved by the CPM. Prior to certification, the project owner may have the CRS, alternate CRS, the PPA, and the PHA complete and submit to CEC for review the CRMMP, except for the portions to be contributed by the PTNCL and the DTCCL programs.

The CRMMP shall include, but not be limited to, the elements and measures listed below.

1. The following statement shall be included in the Introduction: —Any discussion, summary, or paraphrasing of the Conditions of Certification in this CRMMP is intended as general guidance and as an aid to the user in understanding the Conditions and their implementation. The conditions, as written in the Commission

Decision, shall supersede any summarization, description, or interpretation of the conditions in the CRMMP. The Cultural Resources Conditions of Certification from the Commission Decision are contained in Appendix A."

2. The duties of the CRS shall be fully discussed, including coordination duties with respect to the completion of the Prehistoric Trails Network Cultural Landscape (PTNCL) documentation and possible NRHP nomination program and the Desert Training Center California-Arizona Maneuver Area Cultural Landscape (DTCCL) documentation and possible NRHP nomination program, and oversight/management duties with respect to site evaluation, data collection, monitoring, and reporting at both known prehistoric and historic-period archaeological sites and any CRHR-eligible (as determined by the CPM) prehistoric and historic-period archaeological sites discovered during construction.

3. A general research design shall be developed that:

a. Charts a timeline of all research activities, including those coordinated under the PTNCL and DTCCL documentation and possible NRHP nomination programs;

b. Recapitulates the existing paleoenvironmental, prehistoric, ethnohistoric, ethnographic, and historic contexts developed in the PTNCL and DTCCL historic context and adds to these the additional context of the non-military, historic-period occupation and use of the Chuckwalla Valley, to create a comprehensive historic context for the PSPP vicinity;

c. Poses archaeological research questions and testable hypotheses specifically applicable to the archaeological resource types known for the Chuckwalla Valley, based on the research questions developed under the PTNCL and DTCCL research and on the archaeological and historical literature pertinent to the Chuckwalla Valley; and

d. Clearly articulates why it is in the public interest to address the research questions that it poses.

4. Protocols, reflecting the guidance provided in **CUL-10** through **CUL-15** shall be specified for the treatment of known and newly discovered prehistoric and historic-period archaeological resource types.

5. Artifact collection, retention/disposal, and curation policies shall be discussed, as related to the research questions formulated in the research design. These policies shall apply to cultural resources materials and documentation resulting from evaluation and data recovery at both known prehistoric and historic-period archaeological sites and any CRHR-eligible (as determined by the CPM) prehistoric and historic-period archaeological sites discovered during construction. A prescriptive treatment plan may be included in the CRMMP for limited data types.

6. The implementation sequence and the estimated time frames needed to accomplish all project-related tasks during the ground-disturbance and post-ground–disturbance analysis phases of the project shall be specified.

7. Person(s) expected to perform each of the tasks, their responsibilities, and the reporting relationships between project construction management and the mitigation and monitoring team shall be identified.

8. The manner in which Native American observers or monitors will be included, in addition to their roles in the activities required under CUL-1, the procedures to be used to select them, and their roles and responsibilities shall be described.

9. All impact-avoidance measures (such as flagging or fencing) to prohibit or otherwise restrict access to sensitive resource areas that are to be avoided during ground disturbance, construction, and/or operation shall be described. Any areas where these measures are to be implemented shall be identified. The description shall address how these measures would be implemented prior to the start of ground disturbance and how long they would be needed to protect the resources from project-related impacts.

10. The commitment to record on Department of Parks and Recreation (DPR) 523 forms, to map, and to photograph all encountered cultural resources over 50 years of age shall be stated. In addition, the commitment to curate all archaeological materials retained as a result of the archaeological investigations (survey, testing, data recovery), in accordance with the California State Historical Resources Commission's Guidelines for the Curation of Archaeological Collections, into a retrievable storage collection in a public repository or museum shall be stated.

11. The commitment of the project owner to pay all curation fees for artifacts recovered and for related documentation produced during cultural resources investigations conducted for the project shall be stated. The project owner shall identify a curation facility that could accept cultural resources materials resulting from PSPP cultural resources investigations.

12. The CRS shall attest to having access to equipment and supplies necessary for site mapping, photography, and recovery of all cultural resource materials (that cannot be treated prescriptively) from known CRHR-eligible archaeological sites and from CRHR-eligible sites that are encountered during ground disturbance .

13. The contents, format, and review and approval process of the final Cultural Resource Report (CRR) shall be described.

Verification:

1. Preferably at least ~~90~~ 45 days, but in any event no less than 30 days, the project owner shall submit the CRMMP to the CPM for review and approval.

2. At least 20 days prior to the start of ground disturbance, in a letter to the CPM, the project owner shall agree to pay curation fees for any materials generated or collected as a result of the archaeological investigations (survey, testing, data recovery).

3. At least 30 days prior to the initiation of ground disturbance, the project owner shall provide to the CPM a copy of a letter from a curation facility that meets the standards stated in the California State Historical Resources Commission's Guidelines for the Curation of Archaeological Collections, stating the facility's willingness and ability to receive the materials generated by PSPP cultural resources activities and requiring curation. Any agreements concerning curation will be retained and available for audit for the life of the project.

CUL-6 CULTURAL RESOURCES REPORT (CRR)

The project owner shall submit the final Cultural Resources Report (CRR) to the CPM for review and approval and to the BLM Palm Springs archaeologist

for review and comment. The final CRR shall be written by or under the direction of the CRS. The final CRR shall report on all field activities including dates, times and locations, results, samplings, and analyses. All survey reports, revised and final Department of Parks and Recreation (DPR) 523 forms, data recovery reports, and any additional research reports not previously submitted to the California Historical Resource Information System (CHRIS) and the State Historic Preservation Officer (SHPO) shall be included as appendices to the final CRR.

If the project owner requests a suspension of ground disturbance and/or construction activities, then a draft CRR that covers all cultural resources activities associated with the project shall be prepared by the CRS and submitted to the CPM and to the BLM Palm Springs archaeologist for review and approval on the same day as the suspension/extension request. The draft CRR shall be retained at the project site in a secure facility until ground disturbance and/or construction resumes or the project is withdrawn. If the project is withdrawn, then a final CRR shall be submitted to the CPM for review and approval at the same time as the withdrawal request.

Verification:

1. Within 30 days after requesting a suspension of construction activities, the project owner shall submit a draft CRR to the CPM for review and approval.
2. Within 180 days after completion of ground disturbance (including landscaping), the project owner shall submit the final CRR to the CPM for review and approval and to the BLM Palm Springs archaeologist for review and comment. If any reports have previously been sent to the CHRIS, then receipt letters from the CHRIS or other verification of receipt shall be included in an appendix.
3. Within 10 days after the CPM and the BLM Palm Springs archaeologist approve the CRR, the project owner shall provide documentation to the CPM confirming that copies of the final CRR have been provided to the SHPO, the CHRIS, the curating institution, if archaeological materials were collected, and to the Tribal Chairpersons of any Native American groups requesting copies of project-related reports.

CUL-7 WORKER ENVIRONMENTAL AWARENESS PROGRAM (WEAP)

Prior to and for the duration of ground disturbance, the project owner shall provide Worker Environmental Awareness Program (WEAP) training to all new workers within their first week of employment at the project site, along the linear facilities routes, and at laydown areas, roads, and other ancillary areas. The training shall be prepared by the CRS, may be conducted by any member of the archaeological team, and may be presented in the form of a video. The CRS shall be available (by telephone or in person) to answer questions posed by employees. The training may be discontinued when ground disturbance is completed or suspended, but must be resumed when ground disturbance, such as landscaping, resumes.

The training shall include:

1. A discussion of applicable laws and penalties under the law;
2. Samples or visuals of artifacts that might be found in the project vicinity;
3. A discussion of what such artifacts may look like when partially buried, or wholly buried and then freshly exposed;
4. A discussion of what prehistoric and historical archaeological deposits look like at the surface and when exposed during construction, and the range of variation in the appearance of such deposits;
5. Instruction that the CRS, alternate CRS, and CRMs have the authority to halt ground disturbance in the area of a discovery to an extent sufficient to ensure that the resource is protected from further impacts, as determined by the CRS;
6. Instruction that employees are to halt work on their own in the vicinity of a potential cultural resources discovery and shall contact their supervisor and the CRS or CRM, and that redirection of work would be determined by the construction supervisor and the CRS;
7. An informational brochure that identifies reporting procedures in the event of a discovery;
8. An acknowledgement form signed by each worker indicating that they have received the training; and
9. A sticker that shall be placed on hard hats indicating that environmental training has been completed.
10. No ground disturbance shall occur prior to implementation of the WEAP program, unless such activities are specifically approved by the CPM.

Verification:

1. At least 30 days prior to the beginning of ground disturbance, the CRS shall provide the training program draft text and graphics and the informational brochure to the CPM for review and approval.
2. At least 15 days prior to the beginning of ground disturbance, the CPM will provide to the project owner a WEAP Training Acknowledgement form for each WEAP trained worker to sign.
3. Monthly, until ground disturbance is completed, the project owner shall provide in the Monthly Compliance Report (MCR) the WEAP Training Acknowledgement forms of

workers who have completed the training in the prior month and a running total of all persons who have completed training to date.

CUL-8 CONSTRUCTION MONITORING PROGRAM

The project owner shall ensure that the CRS, alternate CRS, or CRMs, to prevent construction impacts to undiscovered resources and to ensure that known resources are not impacted in an unanticipated manner, monitor full time all ground disturbance.

Full-time archaeological monitoring for this project shall be the archaeological monitoring of the earth-removing activities in the areas specified in the previous paragraph, for as long as the activities are ongoing. Where excavation equipment is actively removing dirt and hauling the excavated material farther than fifty feet from the location of active excavation, full-time archaeological monitoring shall require at least two monitors per excavation area. In this circumstance, one monitor shall observe the location of active excavation and a second monitor shall inspect the dumped material. For excavation areas where the excavated material is dumped no farther than fifty feet from the location of active excavation, one monitor shall both observe the location of active excavation and inspect the dumped material.

A Native American monitor shall be obtained to monitor ground disturbance in areas where Native American artifacts may be discovered. Contact lists of interested Native Americans and guidelines for monitoring shall be obtained from the Native American Heritage Commission. Preference in selecting a monitor shall be given to Native Americans with traditional ties to the area that shall be monitored. If efforts to obtain the services of a qualified Native American monitor are unsuccessful, the project owner shall immediately inform the CPM. The CPM will either identify potential monitors or will allow ground disturbance to proceed without a Native American monitor.

The research design in the CRMMP shall govern the collection, treatment, retention/disposal, and curation of any archaeological materials encountered.

On forms provided by the CPM, CRMs shall keep a daily log of any monitoring and other cultural resources activities and any instances of noncompliance with the Conditions and/or applicable LORS. Copies of the daily monitoring logs shall be provided by the CRS to the CPM, if requested by the CPM. From these logs, the CRS shall compile a monthly monitoring summary report to be included in the MCR. If there are no monitoring activities, the summary report shall specify why monitoring has been suspended.

The CRS or alternate CRS shall report daily to the CPM on the status of the project‘s cultural resources-related activities, unless reducing or ending daily reporting is requested by the CRS and approved by the CPM.
In the event that the CRS believes that the current level of monitoring is not appropriate in certain locations, a letter or e-mail detailing the justification for changing the level of monitoring shall be provided to the CPM for review and approval prior to any change in the level of monitoring. The CRS, at his or her discretion, or at the request of the CPM, may informally discuss cultural resources monitoring and mitigation activities with Energy Commission technical staff.

Cultural resources monitoring activities are the responsibility of the CRS. Any interference with monitoring activities, removal of a monitor from duties assigned by the CRS, or direction to a monitor to relocate monitoring activities by anyone other than the CRS shall be considered non-compliance with these

Conditions.

Upon becoming aware of any incidents of non-compliance with the Conditions and/or applicable LORS, the CRS and/or the project owner shall notify the CPM by telephone or e-mail within 24 hours. The CRS shall also recommend corrective action to resolve the problem or achieve compliance with the Conditions. When the issue is resolved, the CRS shall write a report describing the issue, the resolution of the issue, and the effectiveness of the resolution measures. This report shall be provided in the next MCR for the review of the CPM.

Verification:

1. At least 30 days prior to the start of ground disturbance, the CPM will provide to the CRS an electronic copy of a form to be used as a daily monitoring log.
2. Monthly, while monitoring is on-going, the project owner shall include in each MCR a copy of the monthly summary report of cultural resources-related monitoring prepared by the CRS and shall attach any new DPR 523A forms completed for finds treated prescriptively, as specified in the CRMMP.
3. At least 24 hours prior to implementing a proposed change in monitoring level, the project owner shall submit to the CPM, for review and approval, a letter or e-mail (or some other form of communication acceptable to the CPM) detailing the CRS‘s justification for changing the monitoring level.
4. Daily, as long as no cultural resources are found, the CRS shall provide a statement that “no cultural resources over 50 years of age were discovered” to the CPM as an e-mail or in some other form of communication acceptable to the CPM.

6. At least 24 hours prior to reducing or ending daily reporting, the project owner shall submit to the CPM, for review and approval, a letter or e-mail (or some other form of communication acceptable to the CPM) detailing the CRS‘s justification for reducing or ending daily reporting.
7. No later than 30 days following the discovery of any Native American cultural materials, the project owner shall submit to the CPM copies of the information transmittal letters sent to the Chairpersons of the Native American tribes or groups who requested the information. Additionally, the project owner shall submit to the CPM copies of letters of transmittal for all subsequent responses to Native American requests for notification, consultation, and reports and records.
8. Within 15 days of receiving them, the project owner shall submit to the CPM copies of any comments or information provided by Native Americans in response to the project owner‘s transmittals of information.

CUL-9 AUTHORITY TO HALT CONSTRUCTION; TREATMENT OF DISCOVERIES

The project owner shall grant authority to halt ground disturbance to the CRS, alternate CRS, PPA, PHA, PG, PE, and the CRMs in the event of a discovery. Redirection of ground disturbance shall be accomplished under the direction of the construction supervisor in consultation with the CRS.

In the event that a cultural resource over 50 years of age is found (or if

younger, determined exceptionally significant by the CPM), or impacts to such a resource can be anticipated, ground disturbance shall be halted or redirected in the immediate vicinity of the discovery sufficient to ensure that the resource is protected from further impacts. Monitoring and daily reporting, as provided in other conditions, shall continue during the project's ground-disturbing activities elsewhere. The halting or redirection of ground disturbance shall remain in effect until the CRS has visited the discovery, and all of the following have occurred:

1 The CRS has notified the project owner, and the CPM has been notified within 24 hours of the discovery, or by Monday morning if the cultural resources discovery occurs between 8:00 AM on Friday and 8:00 AM on Sunday morning, including a description of the discovery (or changes in character or attributes), the action taken (i.e., work stoppage or redirection), a recommendation of CRHR eligibility, and recommendations for data recovery from any cultural resources discoveries, whether or not a determination of CRHR eligibility has been made.

2 If the discovery would be of interest to Native Americans, the CRS has notified all Native American groups that expressed a desire to be notified in the event of such a discovery.

3 The CRS has completed field notes, measurements, and photography for a DPR 523 "Primary" form. Unless the find can be treated prescriptively, as specified in the CRMMP, the "Description" entry of the DPR 523 "Primary" form shall include a recommendation on the CRHR eligibility of the discovery. The project owner shall submit completed forms to the CPM.

4 The CRS, the project owner, and the CPM have conferred, and the CPM has concurred with the recommended eligibility of the discovery and approved the CRS's proposed data recovery plan, if any, including the curation of the artifacts, or other appropriate mitigation; and any necessary data recovery and mitigation have been completed.

Verification:

1. At least 30 days prior to the start of ground disturbance, the project owner shall provide the CPM and CRS with a letter confirming that the CRS, alternate CRS, PPA, PHA, PG, and CRMs have the authority to halt ground disturbance in the vicinity of a cultural resources discovery, and that the project owner shall ensure that the CRS notifies the CPM within 24 hours of a discovery, or by Monday morning if the cultural resources discovery occurs between 8:00 AM on Friday and 8:00 AM on Sunday morning.
2. Within 48 hours of the discovery of a resource of interest to Native Americans, the project owner shall ensure that the CRS notifies all Native American groups that expressed a desire to be notified in the event of such a discovery.
3. Unless the discovery can be treated prescriptively, as specified in the CRMMP, completed DPR 523 forms for resources newly discovered during ground disturbance shall be submitted to the CPM for review and approval no later than 24 hours following the notification of the CPM, or 48 hours following the completion of data recordation/recovery, whichever the CRS decides is more appropriate for the

subject cultural resource.

CUL-10 FLAG AND AVOID

If resources within the transmission line corridor can be spanned rather than impacted, and in the event that new resources are discovered during construction where impacts can be reduced or avoided, the project owner shall:

1 Ensure that a CRS, alternate CRS, PPA, or CRM re-establish the boundary of each site, add a 10-meter-wide buffer around the periphery of each site boundary, and flag the resulting space in a conspicuous manner;

2 Ensure that a CRM enforces avoidance of the flagged areas during PSPP construction; and

3 Ensure, after completion of construction, boundary markings around each site and buffer are removed so as not to attract vandals.

Verification:

Within 90 days of the completion of plant construction, the project owner shall submit for CPM review and approval a letter, with photograph and maps, evidencing the removal of boundary markings.

CUL-11 DATA RECOVERY FOR SIMPLE PREHISTORIC SITES

(Sparse Lithic Scatters, Cairns, and Pot Drops)

The project owner shall ensure the CRMMP includes a data recovery plan for the resource type “simple prehistoric sites,” consisting of sites SMP-P-1015, SMP-P-1016, SMP-P-2014, SMP-P-2015, and SMP-P-001. This site list may be revised only with the agreement of the CRS and the CPM. The data recovery plan shall include the use of the CARIDAP protocol on sites that qualify, how to proceed if features or other buried deposits are encountered, and the materials analyses and laboratory artifact analyses that will be used.

The plan shall also specify in detail the location recordation equipment and methods used and describe any post-processing of the data. If allowed by the BLM, prior to the start of ground disturbance within 30 meters of the site boundaries of each of these sites, the project owner shall ensure that the CRS, the PSSA, the PPA, and/or archaeological team members implement the plan, which, for sites where CARIDAP does not apply, shall include, but is not limited to the following tasks:

1. Use location recordation equipment that has the latest technology with sub-meter accuracy (such as UTM 11 North or California Teale Albers) to add to the original site maps the following features: seasonal drainages, site boundaries, location of each individual artifact, and the boundaries around individual artifact concentrations;
2. Request the PTNCL PG, or equivalent qualified person approved by the CPM and hired by the project owner should the PTNCL geoarchaeologist not be available, to identify the specific landform for each site and its relationship to specific ancient lakeshores of Palen Dry Lake; if a lakeshore is present within 100 meters of the site

boundary, include it on the site map;

3. Map and field-record all lithic artifacts (numbers of flakes, the reduction sequence stage each represents, cores, tool blanks, finished tools, hammerstones, and concentrations, and the material types of each) and the other types of prehistoric artifacts present
4. Map any differential distribution of artifacts and suggest explanations for the distribution
5. Assess the integrity of the site and provide the evidence substantiating that assessment;
6. Collect for dating and source analyses any obsidian artifacts;
7. Field record the surface location of all other artifacts and collect all ceramic artifacts and botanical and faunal remains for laboratory analysis and curation;
8. Surface scrape to a depth of 5 centimeters a 5-meter-by-5-meter area centered on the artifact concentration, field-record the lithic artifacts as to location, material type, and the reduction sequence stage each represents, record the location of all other artifacts, and retain the obsidian and ceramic artifacts and botanical and faunal remains for laboratory analysis and curation;
9. Excavate one 1-meter-by-1-meter unit in 10-centimeter levels until the unit reaches a depth of 20 centimeters below any anthropogenic materials, placing the unit in the part of the site with the highest artifact density and recording its locations on the site map;

10.Place one 1-meter-by-1-meter excavation unit, as described above, in the center of each concentration if multiple artifact concentrations have been identified; 11.Notify the CPM by telephone or e-mail that subsurface deposits were or were not encountered and make a recommendation on the site‘s CRHR eligibility;

12.If no subsurface deposits were encountered, and the CPM agrees the site is not eligible for the CRHR, data recovery is complete;

13.If subsurface deposits are encountered, test the horizontal limits of the site by excavating additional 1-meter-by-1-meter excavation units in 10-centimeter levels until the unit reaches a depth of 20 centimeters below any anthropogenic materials, using a shovel or hand auger, or other similar technique, at four spots equally spread around the exterior edge of each site, recording the locations of these units on the site map;

14.Sample the encountered features or deposits, using the methods described in the CRMMP, record their locations on the site map, retain samples, such as flotation, pollen, and charcoal, for analysis, and retain all artifacts for professionally appropriate laboratory analyses and curation, until data recovery is complete;

15.Present the results of the **CUL-11** data recovery in a letter report by the PPA or CRS, which shall serve as a preliminary report. Letter reports may address one site, or multiple sites depending on the needs of the CRS. The letter report shall be a concise document the provides description of the

schedule and methods used in the field effort, a preliminary tally of the numbers and types of features and deposits that were found, a discussion of the potential range of error for that tally, a map showing the location of excavation units including topographic contours and the site landforms, and a discussion of the CRHR eligibility of each site and the justification for that determination;

16. Update the existing Department of Parks and Recreation (DPR) 523 site form for these sites, including new data on seasonal drainages, site boundaries, location of each individual artifact, the boundaries around individual artifact concentrations, the landform, and the eligibility determination;

17.Provide the recovered data to the PTNCL PI-Prehistoric Archaeologist; and

18. Present the final results of data recovery at these prehistoric sites in the CRR, as described in **CUL-6**.

Verification:

1. At least 45~~90~~ days prior to ground disturbance, the project owner shall notify the CPM that data recovery for small sites has ensued.
2. After the completion of the excavation of the first 1-meter-by-1-meter excavation unit at each of the subject sites, the CRS shall notify the CPM regarding the presence or absence of subsurface deposits and shall make a recommendation on the site‘s CRHR eligibility.
3. Within one week of the completion of data recovery at a site, the project owner shall submit a letter report written by the PPA or CRS for review and approval of the

CPM. When the CPM approves the letter report, ground disturbance may begin at this site location.

CUL-12 DATA RECOVERY FOR COMPLEX PREHISTORIC SITES

The project owner shall ensure the CRMMP includes a data recovery plan for the resource type “complex prehistoric sites,” consisting of SMP-P-1017, SMP-P-1018, SMP-P-2018, and SMP-P-2023. This site list may be revised only with the agreement of the CRS and the CPM. The data recovery plan shall include how to proceed if buried deposits are encountered and shall also include the materials analyses and laboratory artifact analyses that will be used. The plan shall also specify in detail the location recordation equipment and methods used and describe any post-processing of the data. If allowed by the BLM, prior to the start of ground disturbance within 30 meters of the site boundaries of each of these sites, the project owner shall then ensure that the CRS, the PPA, and/or archaeological team members implement the plan, which shall include, but is not limited to, the following tasks:

1 Use location recordation equipment that has the latest technology with sub-meter accuracy (such as UTM 11 North or California Teale Albers) to add to the original site maps the following features: seasonal drainages, site boundaries, location of each

individual artifact, and the boundaries around individual artifact concentrations;

2 Request the PTNCL PG, or equivalent qualified person approved by the CPM and hired by the project owner should the PTNCL geoarchaeologist not be available, to identify the specific landform for each site and its relationship to specific ancient lakeshores of Palen Dry Lake. If a lakeshore is present within 100 meters of the site boundary, include it on the site map;

3 Map any differential distribution of artifacts and suggest an explanation for this distribution;

4 Assess the integrity of the site and state the evidence substantiating that opinion;

5 Collect all artifacts after their locations are marked and submit them for laboratory analysis;

6 Excavate one 1-meter-by-1-meter unit in 10-centimeter levels until three sterile levels are encountered, or until the unit reaches maximum depth of planned impact, placing this unit in the part of the site with the highest artifact density; or, if multiple artifact concentrations were identified, place one 1-meter-by-1-meter excavation unit in the center of each concentration and excavate as just described; retain any artifacts for laboratory analysis;

7 Determine the vertical and horizontal limits of the each site by placing test units at four locations equally spread around the surface exterior edge and excavating or probing down to the Holocene basement, using a shovel, hand auger, or similar technique; continue exploration in all directions until

the horizontal limits of the site are reached; retain any artifacts for laboratory analysis;

1 Excavate the surface feature or features, using the methods described in the CRMMP; record their locations on the site map, retain samples, such as flotation, pollen, and charcoal, for analysis, and retain all artifacts for professionally appropriate laboratory analyses and curation, until data recovery is complete;

2 Notify the CPM by telephone or e-mail that subsurface deposits were or

were not encountered and make a recommendation on the site‘s CRHR eligibility;

10. If no subsurface deposits were encountered, and the CPM agrees the site is not eligible for the CRHR, data recovery is complete;

11. If subsurface deposits were found, develop a sampling design for additional data recovery in consultation with the CRS; plans for this contingency shall be described in detail in the CRMMP;

12. Present the results of the **CUL-12** data recovery in a letter report by the PPA or CRS that shall serve as a preliminary report. Letter reports may address one site, or multiple sites depending on the needs of the CRS. The letter report shall be a concise document the provides description of the schedule and methods used in the field effort, a preliminary tally of the numbers and types of features and deposits that were found, a discussion

of the potential range of error for that tally, and a map showing the location of excavation units including topographic contours and the site landforms;

13. Update the existing Department of Parks and Recreation (DPR) 523 site form for these sites, including new data on seasonal drainages, site boundaries, location of each individual artifact, the boundaries around individual artifact concentrations, and the landform;

14. Provide the recovered data to the PTNCL PI-Prehistoric Archaeologist; and

15. Present the final results of data recovery for the complex prehistoric sites in the CRR, as described in **CUL-6**.

Verification:

1. At least ~~90~~ 45 days prior to ground disturbance, the project owner shall notify the CPM that data recovery for small sites has ensued.
2. Within one week of the completion of data recovery at a site, the project owner shall verify this by submitting a letter report written by the PPA or CRS for review and approval of the CPM. When the CPM approves the letter report, ground disturbance may begin at these site locations.

CUL-13 DATA RECOVERY FOR HISTORIC-PERIOD REFUSE SCATTERS

Prior to the start of ground disturbance, the project owner shall ensure that a recovery plan for upgrading the recordation of 3~~5~~1 historic-period refuse scatter sites (SMP-H-1003, SMP-H-1004, SMP-H-1006, SMP-H-1008, SMP-H-1009, SMP-H-1010, SMP-H-1011, SMP-H-1013, SMP-H-1020, SMP-H-1021, SMP-H-1022, SMP-H-1023, SMP-H-2002, SMP-H-2003, SMP-H-2004, SMP-H-2006, SMP-H-2007, SMP-H-2008, SMP-H-2010, SMP-H-2011/12, SMP-H-2017, SMP-H-2019, SMP-H-2021; ~~DS-465, -DS-466, DS-467, DS712~~; JR-101, JR-102, JR-109, JR-110; TC-008, TC -009, TC -020, TC-032), all of which are located on the proposed plant site, is included in the CRMMP. This site list may be revised only with the agreement of the CRS and the CPM.

The focus of the recordation upgrade is to determine if these sites can be attributed to the DTC/C-AMA use of the region and are therefore contributors to the DTCCL. The plan shall specify in detail the location recordation equipment and methods to be used and describe any anticipated post-processing of the data. The project owner shall then ensure that the CRS, the PHA, and/or archaeological team members implement the plan, if allowed by the BLM, which shall include, but is not limited to the following tasks:

1. The project owner shall hire a PHA with the qualifications described in **CUL-3** to supervise the field work.

2. The project owner shall ensure that, prior to beginning the field work, the PHA ~~and all field crew members~~crew chief are ~~are~~ trained by the DTCCL Historical Archaeologist, or equivalent qualified person approved by the CPM and hired by the project owner should the DTCCL Historical Archaeologist not be available, to identify the specific landform for each site; in the identification, analysis and interpretation of the artifacts, environmental

modifications, and trash disposal patterns associated with the early phases of WWII land-based U.S. army activities, as researched and detailed by the DTCCL PI-Historian and the DTCCL Historical Archaeologist.

3. The project owner shall ensure that, prior to beginning the field work, the field crew members are also trained in the consistent and accurate identification of the full range of late nineteenth and early-to-mid-twentieth-century can, bottle, and ceramic diagnostic traits.

4. The project owner shall ensure that the original site map shall be updated to include at minimum: landform features such as small drainages, any man-made features, the limits of any artifact concentrations and features (previously known and newly found in the metal detector survey), using location recordation equipment that has the latest technology with sub-meter accuracy (such as UTM 11 North or California Teale Albers).

5. The project owner shall ensure that a detailed in-field analysis of all artifacts shall be completed, documenting the measurements and the types of seams and closures for each bottle, and the measurements, seams, closure, and opening method for all cans. Photographs shall be taken of maker‘s marks on bottles, any text or designs on bottles and cans, and of decorative patterns and maker‘s marks on ceramics. Artifacts shall not be collected.

~~6. The project owner shall ensure a systematic metal detector survey be completed at each site, and that each “hit” is investigated. All artifacts and features thus found must be mapped, measured, photographed, and fully described in writing.~~

7. The project owner shall ensure that all structures are mapped, measured, photographed, and fully described in writing, and that all associated features having subsurface elements are excavated by a qualified historical archaeologist. All features and contents must be mapped, measured, photographed, and fully described in writing.
8. The project owner shall ensure that the details of what is found at each site shall be presented in a letter report from the CRS or PHA ,which shall serve as a preliminary report, that details what was found at each site, as follows:
a. Letter reports may address one site, or multiple sites depending on the needs of the CRS; and

b. The letter report shall be a concise document the provides a description of the schedule and methods used in the field effort, a preliminary tally of the numbers and types of features and deposits that were found, a discussion of the potential range of error for that tally, and a map showing the location of collection and/or excavation units, including topographic contours and the site landforms.

c. The letter report shall make a recommendation on whether each site is a contributor to the DTTCL.
9. The project owner shall ensure that the data collected from the field work shall be provided to the DTCCL Historical Archaeologist to assist in the determination of which, if any, of the historic-period sites are contributing elements to the DTCCL.

10. The project owner shall ensure that the PHA analyzes all recovered data and writes or supervisors the writing of a comprehensive final report. This report shall be included in the CRR (**CUL-6**). Relevant portions of the information gathered shall be included in the possible NRHP nomination

for the DTCCL (funded by **CUL-2**).

Verification:

1. At least ~~90~~ 45 days prior to ground disturbance, the project owner shall notify the CPM that mapping and upgraded in-field artifact analysis has ensued on six historic-period refuse scatter sites.
2. Within one week of completing data recovery at a site, the project owner shall submit to the CPM for review and approval a letter report written by the CRS, evidencing that the field portion of data recovery at each site has been completed. When the CPM approves the letter report, ground disturbance may begin at the site location(s) that are the subject of the letter report.

CUL-14 DATA RECOVERY FOR HISTORIC-PERIOD SITES WITH FEATURES

Prior to the start of ground disturbance, the project owner shall ensure that a data recovery plan is developed for historic-period archaeological sites with features (SMP-H-1005, SMP-H-1007, SMP-H-2016; ~~DS-327~~). This site list may be revised only with the agreement of the CRS and the CPM. The plan shall specify in detail the location recordation equipment and methods to be used and describe any anticipated post-processing of the data. The project owner shall then ensure that the CRS, the PHA, and/or archaeological team members implement the plan, if allowed by the BLM, which shall include, but is not limited to the following tasks:

1. The project owner shall hire a PHA with the qualifications described in **CUL-3** to supervise the field work.

2. The project owner shall ensure that, prior to beginning the field work, the PHA and ~~all field crew members are~~crew chief are trained by the DTCCL Historical Archaeologist, or equivalent qualified person approved by the CPM and hired by the project owner should the DTCCL Historical Archaeologist not be available, in the identification, analysis and interpretation of the artifacts, environmental modifications, and trash disposal patterns associated with the early phases of WWII land-based U.S. army activities, as researched and detailed by the DTCCL PI-Historian and the DTCCL Historical Archaeologist.

3. The project owner shall ensure that, prior to beginning the field work, the field crew members are also trained in the consistent and accurate identification of the full range of late nineteenth and early-to-mid-twentieth-century can, bottle, and ceramic diagnostic traits.

4. The project owner shall ensure that the original site map shall be updated to include at minimum: landform features such as small drainages, any man-made features, the limits of any artifact concentrations and features (previously known and newly found in the metal detector survey), using location recordation equipment that has the latest technology with sub-meter accuracy (such as UTM 11 North or California Teale Albers).

5. The project owner shall ensure that a detailed in-field analysis of all artifacts shall be completed, if not done previously. Types of seams and closures for each bottle and all cans shall be documented. Photographs shall be taken of any text or designs. Unusual or unidentifiable artifacts may be collected for further analysis, but otherwise artifacts

shall not be collected.

6. The project owner shall ensure a systematic metal detector survey be completed at each site, and that each “hit” is investigated. All artifacts and features thus found must be mapped, measured, photographed, and fully described in writing.

7. The project owner shall ensure that all features are recorded, and that any features having subsurface elements are excavated by a qualified historical archaeologist. All features and contents must be mapped, measured, photographed, and fully described in writing.
8. The project owner shall ensure that the details of what is found at each site shall be presented in a letter report from the CRS or PHA ,which shall serve as a preliminary report, that details what was found at each site, as follows:
a. Letter reports may address one site, or multiple sites depending on the needs of the CRS; and

b. The letter report shall be a concise document the provides a description of the schedule and methods used in the field effort, a preliminary tally of the numbers and types of features and deposits that were found, a discussion of the potential range of error for that tally, and a map showing the location of collection and/or excavation units, including topographic contours and the site landforms.
9. The project owner shall ensure that the data collected from the field work shall be provided to the DTCCL Historical Archaeologist to assist in the determination of which, if any, of the historic-period sites are contributing elements to the DTCCL.

10. The project owner shall ensure that the PHA analyzes all recovered data and writes or supervisors the writing of a comprehensive final report. This report shall be included in the CRR (**CUL-6**). Relevant portions of the information gathered shall be included in the possible NRHP nomination for the DTCCL (funded by **CUL-2**).

Verification:

1. At least ~~90~~ 45 days prior to ground disturbance, the project owner shall notify the CPM that mapping and in-field artifact analysis has ensued on historic-period sites with features.
2. Within one week of completing data recovery at a site, the project owner shall submit to the CPM for review and approval a letter report written by the CRS, evidencing that the field portion of data recovery at each site has been completed. When the CPM approves the letter report, ground disturbance may begin at the site location(s) that are the subject of the letter report.

CUL-15 DATA RECOVERY ON HISTORIC-PERIOD ROADS

The project owner shall ensure that a qualified architectural historian (must meet the U.S. Secretary of the Interior‘s Professional Qualifications Standards for historian, as published in Title 36, Code of Federal Regulations, part 61) conducts research and writes a report on the age and use of SMP-H-1032.

The project owner shall provide the historian‘s report to the DTCCL PI-

Historian for possible use in the DTCCL NRHP nomination, if appropriate.

The project owner may undertake this task prior to Energy Commission certification of the project.

Verification:

1. At least 15 days prior to ground disturbance, the project owner shall submit to the CPM the historian‘s report documenting the age and historical use of the road.
2. Within 15 days after the CPM approves the report, the project owner shall forward it to the DTCCL PI-Historian.

CUL-16 COMPLIANCE WITH BLM PROGRAMMATIC AGREEMENT

If provisions in the BLM PSPP Programmatic Agreement and associated implementation and monitoring programs conflict with or duplicate these Conditions of Certification, the BLM provisions shall take precedence. Provisions in these conditions that are additional to or exceed BLM provisions and represent requirements under the Energy Commission‘s CEQA responsibilities shall continue to apply to the project‘s activities, contingent on BLM‘s approval as authorized by federal law.

STATE OF CALIFORNIA

Energy Resources
Conservation and Development Commission

In the Matter of:	**DOCKET NO. 09-AFC-07**
Application For Certification for the PALEN SOLAR POWER PROJECT	**DECLARATION OF** Stacey Jordan

I, Stacey Jordan, declare as follows:

1. I am presently employed by AECOM, as a Senior Archaeologist.

2. A copy of my professional qualifications and experience is included herewith (Attachment A to Testimony) and is incorporated by reference in this Declaration.

3. I prepared the attached testimony relating to Cultural Resources and Native American Values for the Palen Solar Power Project (California Energy Commission Docket Number 09-AFC-07).

4. It is my professional opinion that the attached prepared testimony is valid and accurate with respect to issues that it addresses.

5. I am personally familiar with the facts and conclusions related in the attached prepared testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury, under the laws of the State of California, that the foregoing is true and correct to the best of my knowledge and that this declaration was executed on October 5, 2010.

_____

Stacey Jordan

PALEN SOLAR POWER PROJECT
HAZARDOUS MATERIALS
OPENING TESTIMONY

I. Name: Michael Cressner

II. Purpose:

My testimony addresses the subjects of Hazardous Materials associated with the construction and operation of the Palen Solar Power Project (09-AFC-07).

III. Qualifications:

Michael Cressner: I am presently employed at Solar Millennium LLC, and have been for the past year and am presently an Associate Developer with that organization. I have a Degree in Political Science and I have over 5 years of experience in the development field. I prepared, caused to be prepared, or reviewed the Hazardous Materials section of the AFC as well as the post-filing information, data responses, and supplemental filings. A detailed description of my qualifications is contained in the attached resume.

To the best of my knowledge all referenced documents and all of the facts contained in this testimony are true and correct. To the extent this testimony contains opinions, such opinions are my own. I make these statements and provide these opinions freely and under oath for the purpose of constituting sworn testimony in this proceeding.

IV. Exhibits

In addition to this written testimony, I am sponsoring the following exhibits in this proceeding.

Exhibit 1	**Palen Solar I, LLC's Application for Certification Volumes I & II**, dated August 2009, and docketed on August 24, 2009, Section 5.6, Appendix D.

Exhibit 27	**Palen Solar I, LLC's Initial Comments on the Staff Assessment/ Draft Environmental Impact Statement**, dated May 4, 2010, and docketed on May 4, 2010.
Exhibit 34	**Palen Solar I, LLC's Responses to Questions from the April 28, 29, and May 7, 2010, CEC Workshops- Worker Safety, Hazardous Materials, Soil & Water Resources**, dated May 21, 2010, and docketed on May 21, 2010.
Exhibit 44	**Palen Solar I, LLC's Data Responses to Alternatives 2 & 3**, dated July 20, 2010 and docketed on July 20, 2010.
Exhibit 51	**Palen Solar I, LLC's Updated Hazardous Materials Table 5.6-3R for PSPP Reconfigured Alternatives 2 & 3**, dated August 2010, and docketed on August 13, 2010.

V. Opinion and Conclusions

I have reviewed the Hazardous Materials section of the Revised Staff Assessment and agree that with incorporation of the Conditions of Certification, the Project will not result in significant impacts to Geological or Paleontological Resources and will comply with all applicable laws, ordinances, regulations and standards (LORS). I do note that the Hazardous Materials List in Appendix A should be updated to reflect Exhibit 51 which was docketed on August 13, 2010.

STATE OF CALIFORNIA

Energy Resources
Conservation and Development Commission

In the Matter of:	**DOCKET NO. 09-AFC-07**
Application For Certification for the PALEN SOLAR POWER PROJECT	**DECLARATION OF** Michael Cressner

I, Michael Cressner, declare as follows:

1. I am presently employed by Solar Millennium, LLC as an Associate, Project Development and Permitting.

2. A copy of my professional qualifications and experience is included herewith (Attachment A to Testimony) and is incorporated by reference in this Declaration.

3. I prepared the attached testimony relating to Hazardous Materials Management for the Palen Solar Power Project (California Energy Commission Docket Number 09-AFC-07).

4. It is my professional opinion that the attached prepared testimony is valid and accurate with respect to issues that it addresses.

5. I am personally familiar with the facts and conclusions related in the attached prepared testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury, under the laws of the State of California, that the foregoing is true and correct to the best of my knowledge and that this declaration was executed on October 5, 2010.

Original Signed
Michael Cressner

PALEN SOLAR POWER PROJECT
PUBLIC HEALTH
OPENING TESTIMONY

I. Name: Michael Cressner

II. Purpose:

My testimony addresses the subject of Public Health associated with the construction and operation of the Palen Solar Power Project (09-AFC-07).

III. Qualifications:

Michael Cressner: I am presently employed at Solar Millennium LLC, and have been for the past year and am presently an Associate Developer with that organization. I have a Degree in Political Science and I have over 5 years of experience in the development field. I prepared, caused to be prepared, or reviewed the Public Health section of the AFC as well as the post-filing information, data responses, and supplemental filings. A detailed description of my qualifications is contained in the attached resume.

To the best of my knowledge all referenced documents and all of the facts contained in this testimony are true and correct. To the extent this testimony contains opinions, such opinions are my own. I make these statements and provide these opinions freely and under oath for the purpose of constituting sworn testimony in this proceeding.

IV. Exhibits

In addition to this written testimony, I am sponsoring the following exhibits in this proceeding.

Exhibit 1	**Palen Solar I, LLC's Application for Certification Volumes I & II**, dated August 2009, and docketed on August 24, 2009, Section 5.10.

Exhibit 11 **Palen Solar I, LLC's Responses to CEC Data Requests Set 1**, dated January 2010, and docketed on January 22, 2010, Responses 172 through 179.

V. Opinion and Conclusions

I have reviewed the Public Health section of the Revised Staff Assessment and agree that with incorporation of the Conditions of Certification, the Project will not result in significant impacts and will comply with all applicable laws, ordinances, regulations and standards (LORS).

STATE OF CALIFORNIA

Energy Resources
Conservation and Development Commission

In the Matter of:	**DOCKET NO. 09-AFC-07**
Application For Certification for the PALEN SOLAR POWER PROJECT	**DECLARATION OF** Michael Cressner

I, Michael Cressner, declare as follows:

1. I am presently employed by Solar Millennium, LLC, as an Associate, Project Development and Permitting.

2. A copy of my professional qualifications and experience is included herewith (Attachment A to Testimony) and is incorporated by reference in this Declaration.

3. I prepared the attached testimony relating to Public Health and Safety for the Palen Solar Power Project (California Energy Commission Docket Number 09-AFC-07).

4. It is my professional opinion that the attached prepared testimony is valid and accurate with respect to issues that it addresses.

5. I am personally familiar with the facts and conclusions related in the attached prepared testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury, under the laws of the State of California, that the foregoing is true and correct to the best of my knowledge and that this declaration was executed on October 6, 2010.

Original Signed
Michael Cressner

PALEN SOLAR POWER PROJECT
LAND USE
OPENING TESTIMONY

I. Name: Michael Cressner

II. Purpose:

My testimony addresses the subject of Land Use associated with the construction and operation of the Palen Solar Power Project (09-AFC-07).

III. Qualifications:

Michael Cressner: I am presently employed at Solar Millennium LLC, and have been for the past year and am presently an Associate Developer with that organization. I have a Degree in Political Science and I have over 5 years of experience in the development field. I prepared, caused to be prepared, or reviewed the Land Use section of the AFC as well as the post-filing information, data responses, and supplemental filings. A detailed description of my qualifications is contained in the attached resume.

To the best of my knowledge all referenced documents and all of the facts contained in this testimony are true and correct. To the extent this testimony contains opinions, such opinions are my own. I make these statements and provide these opinions freely and under oath for the purpose of constituting sworn testimony in this proceeding.

IV. Exhibits

In addition to this written testimony, I am sponsoring the following exhibits in this proceeding.

Exhibit 1	**Palen Solar I, LLC's Application for Certification Volumes I & II**, dated August 2009, and docketed on August 24, 2009, Section 5.7, Appendix A.

Exhibit 14	**Palen Solar I, LLC's Data Response to CEC January 11, 2010 Email Queries Regarding Acreage Clarification**, dated January 13, 2010, and docketed on February 4, 2010.
Exhibit 19	**Letter from Riverside County Planning Department (RE: Review of AFC and NOI)**, dated February 16, 2010 and docketed on February 17, 2010.
Exhibit 27	**Palen Solar I, LLC's Initial Comments on the Staff Assessment/ Draft Environmental Impact Statement**, dated May 4, 2010, and docketed on May 4, 2010.
Exhibit 33	**Riverside County Zoning Letter**, dated May 20, 2010, and docketed on May 21, 2010.

V. Opinion and Conclusions

I have reviewed the Land Use section of the Revised Staff Assessment. As discussed at a recent Staff Workshop, Condition of Certification **LAND-2** should be deleted as it is inapplicable because no facilities subject to the Riverside County Development Impact Fee would be constructed on the private land. With that deletion, I agree that with incorporation of the rest of the Conditions of Certification, the Project will not result in significant Land Use impacts and will comply with all applicable laws, ordinances, regulations and standards (LORS).

STATE OF CALIFORNIA

Energy Resources
Conservation and Development Commission

In the Matter of:	**DOCKET NO. 09-AFC-07**
Application For Certification for the PALEN SOLAR POWER PROJECT	**DECLARATION OF** Michael Cressner

I, Michael Cressner, declare as follows:

1. I am presently employed by Solar Millennium, LLC as an Associate, Project Development and Permitting.

2. A copy of my professional qualifications and experience is included herewith (Attachment A to Testimony) and is incorporated by reference in this Declaration.

3. I prepared the attached testimony relating to Land Use, Recreation and Wilderness for the Palen Solar Power Project (California Energy Commission Docket Number 09-AFC-07).

4. It is my professional opinion that the attached prepared testimony is valid and accurate with respect to issues that it addresses.

5. I am personally familiar with the facts and conclusions related in the attached prepared testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury, under the laws of the State of California, that the foregoing is true and correct to the best of my knowledge and that this declaration was executed on October 6, 2010.

Original Signed
Michael Cressner

PALEN SOLAR POWER PROJECT
NOISE AND VIBRATION
OPENING TESTIMONY

I. Name: Michael Cressner

II. Purpose:

My testimony addresses the subject of Noise and Vibration associated with the construction and operation of the Palen Solar Power Project (09-AFC-07).

III. Qualifications:

Michael Cressner: I am presently employed at Solar Millennium LLC, and have been for the past year and am presently an Associate Developer with that organization. I have a Degree in Political Science and I have over 5 years of experience in the development field. I prepared, caused to be prepared, or reviewed the Noise and Vibration section of the AFC as well as the post-filing information, data responses, and supplemental filings. A detailed description of my qualifications is contained in the attached resume.

To the best of my knowledge all referenced documents and all of the facts contained in this testimony are true and correct. To the extent this testimony contains opinions, such opinions are my own. I make these statements and provide these opinions freely and under oath for the purpose of constituting sworn testimony in this proceeding.

IV. Exhibits

In addition to this written testimony, I am sponsoring the following exhibits in this proceeding.

Exhibit 1	**Palen Solar I, LLC's Application for Certification Volumes I & II**, dated August 2009, and docketed on August 24, 2009, Section 5.8.
Exhibit 27	**Palen Solar I, LLC's Initial Comments on the Staff Assessment/ Draft Environmental Impact Statement**, dated May 4, 2010, and docketed on May 4, 2010.

V. Opinion and Conclusions

I have reviewed the Noise and Vibration section of the Revised Staff Assessment. As discussed at the recent workshop, Staff agreed to make the following modifications to Conditions of Certification **NOISE-4** and **NOISE-6**. With these modifications I agree that with incorporation of the Conditions of Certification, the Project will not result in significant Noise and Vibration impacts and will comply with all applicable laws, ordinances, regulations and standards (LORS).

NOISE-4 The project design and implementation shall include appropriate noise mitigation measures adequate to ensure that the operation of the project will not cause the noise levels due to plant operation alone, during the daytime hours of 7 a.m. to 10 p.m. to exceed an average of ~~42~~ ***48*** dBA Leq measured at or near monitoring location LT.

NOISE-6 Heavy equipment operation and noisy construction work relating to any project features ***within ¼ mile of an existing residence*** shall be restricted to the times delineated below, unless a special permit has been issued by the County of Riverside:

Mondays through Fridays: June through September: 6 a.m. to 7 p.m.
October through May: 6 a.m. to 6 p.m. Saturdays: 9 a.m. to 5 p.m.
Sundays and Federal holidays: No Construction Allowed

Haul trucks and other engine-powered equipment shall be equipped with adequate mufflers. Haul trucks shall be operated in accordance with posted speed limits. Truck engine exhaust brake use shall be limited to emergencies.

STATE OF CALIFORNIA

Energy Resources
Conservation and Development Commission

In the Matter of:	**DOCKET NO. 09-AFC-07**
Application For Certification for the PALEN SOLAR POWER PROJECT	**DECLARATION OF** Michael Cressner

I, Michael Cressner, declare as follows:

1. I am presently employed by Solar Millennium, LLC, as an Associate, Project Development and Permitting.

2. A copy of my professional qualifications and experience is included herewith (Attachment A to Testimony) and is incorporated by reference in this Declaration.

3. I prepared the attached testimony relating to Noise and Vibration for the Palen Solar Power Project (California Energy Commission Docket Number 09-AFC-07).

4. It is my professional opinion that the attached prepared testimony is valid and accurate with respect to issues that it addresses.

5. I am personally familiar with the facts and conclusions related in the attached prepared testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury, under the laws of the State of California, that the foregoing is true and correct to the best of my knowledge and that this declaration was executed on October 5, 2010.

Original Signed
Michael Cressner

PALEN SOLAR POWER PROJECT
SOCIOECONOMICS
OPENING TESTIMONY

I. Name: Michael Cressner

II. Purpose:

My testimony addresses the subject of Socioeconomics associated with the construction and operation of the Palen Solar Power Project (09-AFC-07).

III. Qualifications:

Michael Cressner: I am presently employed at Solar Millennium LLC, and have been for the past year and am presently an Associate Developer with that organization. I have a Degree in Political Science and I have over 5 years of experience in the development field. I prepared, caused to be prepared, or reviewed the Socioeconomics section of the AFC as well as the post-filing information, data responses, and supplemental filings. A detailed description of my qualifications is contained in the attached resume.

To the best of my knowledge all referenced documents and all of the facts contained in this testimony are true and correct. To the extent this testimony contains opinions, such opinions are my own. I make these statements and provide these opinions freely and under oath for the purpose of constituting sworn testimony in this proceeding.

IV. Exhibits

In addition to this written testimony, I am sponsoring the following exhibits in this proceeding.

Exhibit 1	**Palen Solar I, LLC's Application for Certification Volumes I & II**, dated August 2009, and docketed on August 24, 2009, Section 5.11.

Exhibit 3	**Letter from Assembly Person V. Manuel Perez (Project Support Letter for PSPP & BSPP)**, dated October 21, 2009, and docketed on October 26, 2009.
Exhibit 41	**Emails Regarding School Impact Fee (Between Dennis Larson (AECOM) and Scott Debauche (Aspen Environmental Group))**, dated February, 9, 2010, and docketed on June 18, 2010.

V. Opinion and Conclusions

I have reviewed the Socioeconomics section of the Revised Staff Assessment and agree that the Project will not result in significant Socioeconomic impacts and will comply with all applicable laws, ordinances, regulations and standards (LORS). In addition, I believe the Project will have a net economic benefit to the region.

STATE OF CALIFORNIA

Energy Resources
Conservation and Development Commission

In the Matter of:	**DOCKET NO. 09-AFC-07**
Application For Certification for the PALEN SOLAR POWER PROJECT	**DECLARATION OF** Michael Cressner

I, Michael Cressner, declare as follows:

1. I am presently employed by Solar Millennium, LLC, as an Associate, Project Development and Permitting.

2. A copy of my professional qualifications and experience is included herewith (Attachment A to Testimony) and is incorporated by reference in this Declaration.

3. I prepared the attached testimony relating to Socioeconomic and Environmental Justice for the Palen Solar Power Project (California Energy Commission Docket Number 09-AFC-07).

4. It is my professional opinion that the attached prepared testimony is valid and accurate with respect to issues that it addresses.

5. I am personally familiar with the facts and conclusions related in the attached prepared testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury, under the laws of the State of California, that the foregoing is true and correct to the best of my knowledge and that this declaration was executed on October 5, 2010.

Original Signed
Michael Cressner

PALEN SOLAR POWER PROJECT
TRAFFIC AND TRANSPORTATION
OPENING TESTIMONY

I. Name: Shawn Kelly

II. Purpose:

My testimony addresses the subject of Traffic and Transportation associated with the construction and operation of the Palen Solar Power Project (09-AFC-07).

III. Qualifications:

Shawn Kelly: I am presently employed at AECOM, and have been for the past several years and am presently a Senior Manager with that organization. I have 29 years of experience in senior management. I prepared or assisted in the preparation of the Traffic and Transportation section of the AFC as well as the post-filing information, data responses, and supplemental filings. A detailed description of my qualifications is contained in the attached resume.

To the best of my knowledge all referenced documents and all of the facts contained in this testimony are true and correct. To the extent this testimony contains opinions, such opinions are my own. I make these statements and provide these opinions freely and under oath for the purpose of constituting sworn testimony in this proceeding.

IV. Exhibits

In addition to this written testimony, I am sponsoring the following exhibits in this proceeding.

Exhibit 1	**Palen Solar I, LLC's Application for Certification Volumes I & II**, dated August 2009, and docketed on August 24, 2009, Section 5.13.

Exhibit 27	**Palen Solar I, LLC's Initial Comments on the Staff Assessment/ Draft Environmental Impact Statement**, dated May 4, 2010, and docketed on May 4, 2010.
Exhibit 55	**Department of Transportation Letter Regarding Gen-Tie and Telecommunication Encroachment Concurrence**, dated August 23, 2010, and docketed on August 30, 2010.

V. Opinion and Conclusions

I have reviewed the Traffic and Transportation section of the Revised Staff Assessment and agree with all of the Conditions of Certification expect **TRANS-6**. This condition was included by Staff to mitigate glint and glare that Staff believes may affect motorists on I-10. I disagree that the PSPP could create glint or glare that would result in a significant impact to motorists. Motorists encounter glint and glare from all kinds of surfaces and often drive directly into the sun. There is simply no evidence that such glint and glare would occur or that it would distract motorists to an extent that would constitute a significant impact. Therefore the operation restrictions imposed by the condition are simply unwarranted and I recommend it be deleted.

I do believe that with incorporation of the rest of the Conditions of Certification, the Project will not result in significant Traffic and Transportation impacts and will comply with all applicable laws, ordinances, regulations and standards (LORS).

STATE OF CALIFORNIA

Energy Resources
Conservation and Development Commission

In the Matter of:	**DOCKET NO. 09-AFC-07**
Application For Certification for the PALEN SOLAR POWER PROJECT	**DECLARATION OF** Shawn Kelly

I, Ralph Hollenbacher, declare as follows:

1. I am presently employed by AECOM, as a Senior Manager.

2. A copy of my professional qualifications and experience is included herewith (Attachment A to Testimony) and is incorporated by reference in this Declaration.

3. I prepared the attached testimony relating to Traffic and Transportation for the Palen Solar Power Project (California Energy Commission Docket Number 09-AFC-07).

4. It is my professional opinion that the attached prepared testimony is valid and accurate with respect to issues that it addresses.

5. I am personally familiar with the facts and conclusions related in the attached prepared testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury, under the laws of the State of California, that the foregoing is true and correct to the best of my knowledge and that this declaration was executed on October 6, 2010.

Original Signed
Shawn Kelly

PALEN SOLAR POWER PROJECT
TRANSMISSION LINE SAFETY AND NUISANCE
OPENING TESTIMONY

I. Name: Michael Cressner

II. Purpose:

My testimony addresses the subject of Transmission Line Safety and Nuisance associated with the construction and operation of the Palen Solar Power Project (09-AFC-07).

III. Qualifications:

Michael Cressner: I am presently employed at Solar Millennium LLC, and have been for the past year and am presently an Associate Developer with that organization. I have a Degree in Political Science and I have over 5 years of experience in the development field. I prepared, caused to be prepared, or reviewed the Transmission Lines Safety and Nuisance section of the AFC as well as the post-filing information, data responses, and supplemental filings. A detailed description of my qualifications is contained in the attached resume.

To the best of my knowledge all referenced documents and all of the facts contained in this testimony are true and correct. To the extent this testimony contains opinions, such opinions are my own. I make these statements and provide these opinions freely and under oath for the purpose of constituting sworn testimony in this proceeding.

IV. Exhibits

In addition to this written testimony, I am sponsoring the following exhibits in this proceeding.

Exhibit 1	**Palen Solar I, LLC's Application for Certification Volumes I & II**, dated August 2009, and docketed on August 24, 2009, Section 5.14.

V. Opinion and Conclusions

I have reviewed the Transmission Line Safety and Nuisance section of the Revised Staff Assessment and agree that with incorporation of the Conditions of Certification, the Project will not result in significant impacts and will comply with all applicable laws, ordinances, regulations and standards (LORS).

STATE OF CALIFORNIA

Energy Resources
Conservation and Development Commission

In the Matter of:	**DOCKET NO. 09-AFC-07**
Application For Certification for the PALEN SOLAR POWER PROJECT	**DECLARATION OF** Michael Cressner

I, Michael Cressner, declare as follows:

1. I am presently employed by Solar Millennium, LLC, as an Associate, Project Development and Permitting.

2. A copy of my professional qualifications and experience is included herewith (Attachment A to Testimony) and is incorporated by reference in this Declaration.

3. I prepared the attached testimony relating to Transmission Line Safety and Nuisance for the Palen Solar Power Project (California Energy Commission Docket Number 09-AFC-07).

4. It is my professional opinion that the attached prepared testimony is valid and accurate with respect to issues that it addresses.

5. I am personally familiar with the facts and conclusions related in the attached prepared testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury, under the laws of the State of California, that the foregoing is true and correct to the best of my knowledge and that this declaration was executed on October 5, 2010.

Original Signed
Michael Cressner

PALEN SOLAR POWER PROJECT
VISUAL RESOURCES
OPENING TESTIMONY

I. Name: Michael Cressner

II. Purpose:

My testimony addresses the subject of Visual Resources associated with the construction and operation of the Palen Solar Power Project (09-AFC-07).

III. Qualifications:

Michael Cressner: I am presently employed at Solar Millennium LLC, and have been for the past year and am presently an Associate Developer with that organization. I have a Degree in Political Science and I have over 5 years of experience in the development field. I prepared, caused to be prepared, or reviewed the Visual Resources section of the AFC as well as the post-filing information, data responses, and supplemental filings. A detailed description of my qualifications is contained in the attached resume.

To the best of my knowledge all referenced documents and all of the facts contained in this testimony are true and correct. To the extent this testimony contains opinions, such opinions are my own. I make these statements and provide these opinions freely and under oath for the purpose of constituting sworn testimony in this proceeding.

IV. Exhibits

In addition to this written testimony, I am sponsoring the following exhibits in this proceeding.

Exhibit 1	**Palen Solar I, LLC's Application for Certification Volumes I & II**, dated August 2009, and docketed on August 24, 2009, Section 5.15.

Exhibit 4	**Palen Solar I, LLC's Data Adequacy Supplement**, dated October 2009, and docketed on October 30, 2009.
Exhibit 11	**Palen Solar I, LLC's Responses to CEC Data Requests Set 1**, dated January 2010, and docketed on January 22, 2010, Responses 255 through 278.
Exhibit 12	**Palen Solar I, LLC's Supplemental Responses to CEC Data Request Set 1**, dated January 2010, and docketed on January 27, 2010, Responses 255 through 278.
Exhibit 27	**Palen Solar I, LLC's Initial Comments on the Staff Assessment/ Draft Environmental Impact Statement**, dated May 4, 2010, and docketed on May 4, 2010.
Exhibit 39	**Palen Solar I, LLC's Responses to Basin and Range Watch Data Requests**, dated June 14, 2010, and docketed on June 15, 2010.

V. Opinion and Conclusions

I have reviewed the Visual Resources section of the Revised Staff Assessment and agree the Conditions of Certification and agree that the Project will comply with all applicable laws, ordinances, regulations and standards (LORS).

STATE OF CALIFORNIA

Energy Resources
Conservation and Development Commission

In the Matter of:	**DOCKET NO. 09-AFC-07**
Application For Certification for the PALEN SOLAR POWER PROJECT	**DECLARATION OF** Michael Cressner

I, Michael Cressner, declare as follows:

1. I am presently employed by Solar Millennium, LLC, as an Associate, Project Development and Permitting.

2. A copy of my professional qualifications and experience is included herewith (Attachment A to Testimony) and is incorporated by reference in this Declaration.

3. I prepared the attached testimony relating to Visual Resources for the Palen Solar Power Project (California Energy Commission Docket Number 09-AFC-07).

4. It is my professional opinion that the attached prepared testimony is valid and accurate with respect to issues that it addresses.

5. I am personally familiar with the facts and conclusions related in the attached prepared testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury, under the laws of the State of California, that the foregoing is true and correct to the best of my knowledge and that this declaration was executed on October 5, 2010.

Original Signed
Michael Cressner

PALEN SOLAR POWER PROJECT
WASTE MANAGEMENT
OPENING TESTIMONY

I. Name: Michael Cressner

II. Purpose:

My testimony addresses the subject of Waste Management associated with the construction and operation of the Palen Solar Power Project (09-AFC-07).

III. Qualifications:

Michael Cressner: I am presently employed at Solar Millennium LLC, and have been for the past year and am presently an Associate Developer with that organization. I have a Degree in Political Science and I have over 5 years of experience in the development field. I prepared, caused to be prepared, or reviewed the Waste Management section of the AFC as well as the post-filing information, data responses, and supplemental filings. A detailed description of my qualifications is contained in the attached resume.

To the best of my knowledge all referenced documents and all of the facts contained in this testimony are true and correct. To the extent this testimony contains opinions, such opinions are my own. I make these statements and provide these opinions freely and under oath for the purpose of constituting sworn testimony in this proceeding.

IV. Exhibits

In addition to this written testimony, I am sponsoring the following exhibits in this proceeding.

Exhibit 1	**Palen Solar I, LLC's Application for Certification Volumes I & II**, dated August 2009, and docketed on August 24, 2009, Section 5.16, Appendix I.

Exhibit 4	**Palen Solar I, LLC's Data Adequacy Supplement**, dated October 2009, and docketed on October 30, 2009.
Exhibit 11	**Palen Solar I, LLC's Responses to CEC Data Requests Set 1**, dated January 2010, and docketed on January 22, 2010, Responses 279 through 280.
Exhibit 27	**Palen Solar I, LLC's Initial Comments on the Staff Assessment/ Draft Environmental Impact Statement**, dated May 4, 2010, and docketed on May 4, 2010.

V. Opinion and Conclusions

I have reviewed the Waste Management section of the Revised Staff and agree that with incorporation of the Conditions of Certification, the Project will not result in significant Waste Management impacts and will comply with all applicable laws, ordinances, regulations and standards (LORS). I do request one minor modification to Condition of Certification **WASTE-9**. Consistent with the same condition recently incorporated into the Blythe Solar Power Project Final Decision, I recommend the following sentence be added as the last sentence of the condition.

"For the purpose of this Condition of Certification, "release" shall have the definition in Title 40 of the Code of Federal Regulations, Part 302.3."

STATE OF CALIFORNIA

Energy Resources
Conservation and Development Commission

In the Matter of:	**DOCKET NO. 09-AFC-07**
Application For Certification for the PALEN SOLAR POWER PROJECT	**DECLARATION OF** Michael Cressner

I, Michael Cressner, declare as follows:

1. I am presently employed by Solar Millennium, LLC, as an Associate, Project Development and Permitting.

2. A copy of my professional qualifications and experience is included herewith (Attachment A to Testimony) and is incorporated by reference in this Declaration.

3. I prepared the attached testimony relating to Waste Management for the Palen Solar Power Project (California Energy Commission Docket Number 09-AFC-07).

4. It is my professional opinion that the attached prepared testimony is valid and accurate with respect to issues that it addresses.

5. I am personally familiar with the facts and conclusions related in the attached prepared testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury, under the laws of the State of California, that the foregoing is true and correct to the best of my knowledge and that this declaration was executed on October 5, 2010.

Original Signed
Michael Cressner

PALEN SOLAR POWER PROJECT
WORKER SAFETY AND FIRE PROTECTION
OPENING TESTIMONY

I. Name: Michael Cressner

II. Purpose:

My testimony addresses the subject of Worker Safety and Fire Protection associated with the construction and operation of the Palen Solar Power Project (09-AFC-07).

III. Qualifications:

Michael Cressner: I am presently employed at Solar Millennium LLC, and have been for the past year and am presently an Associate Developer with that organization. I have a Degree in Political Science and I have over 5 years of experience in the development field. I prepared, caused to be prepared, or reviewed the Worker Safety and Fire Protection section of the AFC as well as the post-filing information, data responses, and supplemental filings. A detailed description of my qualifications is contained in the attached resume.

To the best of my knowledge all referenced documents and all of the facts contained in this testimony are true and correct. To the extent this testimony contains opinions, such opinions are my own. I make these statements and provide these opinions freely and under oath for the purpose of constituting sworn testimony in this proceeding.

IV. Exhibits

In addition to this written testimony, I am sponsoring the following exhibits in this proceeding.

Exhibit 1	**Palen Solar I, LLC's Application for Certification Volumes I & II**, dated August 2009, and docketed on August 24, 2009, Section 5.18.

Exhibit 27	**Palen Solar I, LLC's Initial Comments on the Staff Assessment/ Draft Environmental Impact Statement**, dated May 4, 2010, and docketed on May 4, 2010.
Exhibit 34	**Palen Solar I, LLC's Responses to Questions from the April 28, 29, and May 7, 2010, CEC Workshops- Worker Safety, Hazardous Materials, Soil & Water Resources**, dated May 21, 2010, and docketed on May 21, 2010.
Exhibit 44	**Palen Solar I, LLC's Data Responses to Alternatives 2 & 3**, dated July 20, 2010 and docketed on July 20, 2010.

V. Opinion and Conclusions

I have reviewed the Worker Safety and Fire Protection section of the Revised Staff and agree that with incorporation of the Conditions of Certification, the Project will not result in significant impacts and will comply with all applicable laws, ordinances, regulations and standards (LORS). In accordance with our discussions with Staff at the recent workshops we provide the following modifications to conditions as agreed. **WORKER SAFETY-6** is modified as discussed and **WORKER SAFETY-7** and **-9** should be replace with the following versions that were included in the recently approved Blythe Solar Power Project Final Decision

WORKER SAFETY-6 The project owner shall:

a. Provide a second***ary site*** access gate for emergency personnel to enter the site. This secondary ***site*** access gate shall be at least one-quarter mile from the main gate.
b. Provide a second access road that comes to the site. This road shall be at a minimum an all-weather gravel road, at least 20 feet

wide, and shall come from the Interstate-10 right-of-way to the project site at the location of where the fence line of the eastern solar field comes the nearest to the I-10 right-of-way. ***If approved by Caltrans, A***a locked gate shall be placed in the I-10 right-of-way fence. The RCFD, the California Highway Patrol, and the Riverside County Sheriff's Department shall be given access to the gate.

c. Maintain the main access road and the second road and provide a plan for implementation.

Plans for the secondary ***site*** access gate, the method of gate operation, secondary gravel road, ***the gate at the I-10 right-of-way if approved by Caltrans,*** and to maintain the roads shall be submitted to the Riverside County Fire Department for review and comment and to the CPM for review and approval.

Verification: At least sixty (60) days prior to the start of site mobilization, the project owner shall submit to the Riverside County Fire Department and the CPM preliminary plans showing the location of a second***ary site*** access gate to the site, a description of how the ***secondary site access*** gate will be opened by the fire department, and a description and map showing the location, dimensions, and composition of the main road, and the gravel road to the second***ary site access gate***.

At least thirty (30) days prior to the start of site mobilization, the project owner shall submit ***the secondary site access gate*** final plans plus the road maintenance plan to the CPM for review and approval. The final plan submittal shall also include a letter containing comments from the Riverside County Fire Department or a statement that no comments were received.

At least thirty (30) days after approval by Caltrans, the project owner shall submit final plans for the gate in the I-10 right-of-way to the Riverside County Fire Department for review and comment and to the CPM for review and approval.

WORKER SAFETY-7 The project owner shall either:

Reach an agreement, either individually or in conjunction with a power generation industry association or group that negotiates on behalf of its members, with the Riverside County Fire Department (RCFD) regarding funding of its project-related share of capital and operating costs to build and operate new fire protection/response infrastructure and provide appropriate equipment as mitigation of project-related impacts on fire protection services within the jurisdiction; **or**

Shall fund its share of the capital costs in the amount of $850,000 and provide an annual payment of $375,000 to the RCFD for the support of new fire department staff and operations and maintenance commencing with the start of construction and continuing annually thereafter on the anniversary until the final date of power plant decommissioning.

Verification: At least 30 days prior to the start of site mobilization, the project owner shall provide to the CPM:

A copy of the individual agreement with the RCFD or, if the owner joins a power generation industry association, a copy of the bylaws and group's agreement/contract with the RCFD.

or

Documentation that a letter of credit in the amount of $850,000 has been provided to the RCFD and documentation that a letter of credit for the first annual payment of $375,000 has been provided to the RCFD.

The project owner shall also provide evidence in each January Monthly Compliance Report during construction and the Annual Compliance Report during operation that subsequent annual payments have been made.

WORKER SAFETY-9 The project owner shall develop and implement an enhanced Dust Control Plan that includes the requirements described in **AQ-SC3** and additionally requires:

i. Site worker use of dust masks (NIOSH N-95 or better) whenever visible dust is present;

ii. Implementation of methods equivalent to Rule 402 of the Kern County Air Pollution Control District (as amended Nov. 3, 2004); and

iii. Implementation of enhanced dust control methods (increased frequency of watering, use of dust suppression chemicals, etc. consistent with **AQ-SC4**) immediately whenever visible dust persists in the breathing zone of the workers, or when PM10 measurements obtained when implementing ii (above) indicate an increase in PM10 concentrations due to project activities of 50 µg/m_3 or more.

Verification: At least 60 days prior to the commencement of site mobilization, the enhanced Dust control Plan shall be provided to the CPM for review andapproval.

STATE OF CALIFORNIA

Energy Resources
Conservation and Development Commission

In the Matter of:	**DOCKET NO. 09-AFC-07**
Application For Certification for the PALEN SOLAR POWER PROJECT	**DECLARATION OF** Michael Cressner

I, Michael Cressner, declare as follows:

1. I am presently employed by Solar Millennium, LLC, as an Associate, Project Development and Permitting.

2. A copy of my professional qualifications and experience is included herewith (Attachment A to Testimony) and is incorporated by reference in this Declaration.

3. I prepared the attached testimony relating to Worker Safety and Fire Protection for the Palen Solar Power Project (California Energy Commission Docket Number 09-AFC-07).

4. It is my professional opinion that the attached prepared testimony is valid and accurate with respect to issues that it addresses.

5. I am personally familiar with the facts and conclusions related in the attached prepared testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury, under the laws of the State of California, that the foregoing is true and correct to the best of my knowledge and that this declaration was executed on October 5, 2010.

Original Signed
Michael Cressner

PALEN SOLAR POWER PROJECT
FACILITY DESIGN
OPENING TESTIMONY

I. Name: Michael Cressner

II. Purpose:

My testimony addresses the subjects of Facility Design associated with the construction and operation of the Palen Solar Power Project (09-AFC-07).

III. Qualifications:

Michael Cressner: I am presently employed at Solar Millennium LLC, and have been for the past year and am presently an Associate Developer with that organization. I have a Degree in Political Science and I have over 5 years of experience in the development field. I prepared, caused to be prepared, or reviewed the Facility Design section of the AFC as well as the post-filing information, data responses, and supplemental filings. A detailed description of my qualifications is contained in the attached resume.

To the best of my knowledge all referenced documents and all of the facts contained in this testimony are true and correct. To the extent this testimony contains opinions, such opinions are my own. I make these statements and provide these opinions freely and under oath for the purpose of constituting sworn testimony in this proceeding.

IV. Exhibits

In addition to this written testimony, I am sponsoring the following exhibits in this proceeding.

Exhibit 1	**Palen Solar I, LLC's Application for Certification Volumes I & II**, dated August 2009, and docketed on August 24, 2009, Section 2.5, Appendix C.

V. Opinion and Conclusions

I have reviewed the Facility Design section of the Revised Staff Assessment and agree that with incorporation of the Conditions of Certification, the Project will not result in significant impacts and will comply with all applicable laws, ordinances, regulations and standards (LORS).

STATE OF CALIFORNIA

Energy Resources
Conservation and Development Commission

In the Matter of:	**DOCKET NO. 09-AFC-07**
Application For Certification for the PALEN SOLAR POWER PROJECT	**DECLARATION OF** Michael Cressner

I, Michael Cressner, declare as follows:

1. I am presently employed by Solar Millennium, LLC, as an Associate, Project Development and Permitting.

2. A copy of my professional qualifications and experience is included herewith (Attachment A to Testimony) and is incorporated by reference in this Declaration.

3. I prepared the attached testimony relating to Facility Design for the Palen Solar Power Project (California Energy Commission Docket Number 09-AFC-07).

4. It is my professional opinion that the attached prepared testimony is valid and accurate with respect to issues that it addresses.

5. I am personally familiar with the facts and conclusions related in the attached prepared testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury, under the laws of the State of California, that the foregoing is true and correct to the best of my knowledge and that this declaration was executed on October 5, 2010.

Original Signed
Michael Cressner

PALEN SOLAR POWER PROJECT
GEOLOGY AND PALEONTOLOGY
OPENING TESTIMONY

I. Name: Michael Cressner

II. Purpose:

My testimony addresses the subjects of Geology and Paleontology associated with the construction and operation of the Palen Solar Power Project (09-AFC-07).

III. Qualifications:

Michael Cressner: I am presently employed at Solar Millennium LLC, and have been for the past year and am presently an Associate Developer with that organization. I have a Degree in Political Science and I have over 5 years of experience in the development field. I prepared, caused to be prepared, or reviewed the Geology and Paleontology section of the AFC as well as the post-filing information, data responses, and supplemental filings. A detailed description of my qualifications is contained in the attached resume.

To the best of my knowledge all referenced documents and all of the facts contained in this testimony are true and correct. To the extent this testimony contains opinions, such opinions are my own. I make these statements and provide these opinions freely and under oath for the purpose of constituting sworn testimony in this proceeding.

IV. Exhibits

In addition to this written testimony, I am sponsoring the following exhibits in this proceeding.

Exhibit 1	**Palen Solar I, LLC's Application for Certification Volumes I & II**, dated August 2009, and docketed on August 24, 2009, Sections 5.5 & 5.9, Appendices B & H.

Exhibit 4	**Palen Solar I, LLC's Data Adequacy Supplement**, dated October 2009, and docketed on October 30, 2009.
Exhibit 11	**Palen Solar I, LLC's Responses to CEC Data Requests Set 1**, dated January 2010, and docketed on January 22, 2010, Responses 169 through 171.

V. Opinion and Conclusions

I have reviewed the Geology and Paleontology section of the Revised Staff Assessment and agree that with incorporation of the Conditions of Certification, the Project will not result in significant impacts to Geological or Paleontological Resources and will comply with all applicable laws, ordinances, regulations and standards (LORS).

STATE OF CALIFORNIA

Energy Resources
Conservation and Development Commission

In the Matter of:	**DOCKET NO. 09-AFC-07**
Application For Certification for the PALEN SOLAR POWER PROJECT	**DECLARATION OF** Michael Cressner

I, Michael Cressner, declare as follows:

1. I am presently employed by Solar Millennium, LLC, as an Associate, Project Development and Permitting.

2. A copy of my professional qualifications and experience is included herewith (Attachment A to Testimony) and is incorporated by reference in this Declaration.

3. I prepared the attached testimony relating to Geology, Paleontology and Minerals for the Palen Solar Power Project (California Energy Commission Docket Number 09-AFC-07).

4. It is my professional opinion that the attached prepared testimony is valid and accurate with respect to issues that it addresses.

5. I am personally familiar with the facts and conclusions related in the attached prepared testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury, under the laws of the State of California, that the foregoing is true and correct to the best of my knowledge and that this declaration was executed on October 5, 2010.

Original Signed
Michael Cressner

PALEN SOLAR POWER PROJECT
EFFICIENCY
OPENING TESTIMONY

I. Name: Michael Cressner

II. Purpose:

My testimony addresses the subject of Power Plant Efficiency associated with the construction and operation of the Palen Solar Power Project (09-AFC-07).

III. Qualifications:

Michael Cressner: I am presently employed at Solar Millennium LLC, and have been for the past year and am presently an Associate Developer with that organization. I have a Degree in Political Science and I have over 5 years of experience in the development field. I prepared, caused to be prepared, or reviewed the Power Plant Efficiency section of the AFC as well as the post-filing information, data responses, and supplemental filings. A detailed description of my qualifications is contained in the attached resume.

To the best of my knowledge all referenced documents and all of the facts contained in this testimony are true and correct. To the extent this testimony contains opinions, such opinions are my own. I make these statements and provide these opinions freely and under oath for the purpose of constituting sworn testimony in this proceeding.

IV. Exhibits

In addition to this written testimony, I am sponsoring the following exhibits in this proceeding.

Exhibit 4	**Palen Solar I, LLC's Data Adequacy Supplement**, dated October 2009, and docketed on October 30, 2009.

V. Opinion and Conclusions

I have reviewed the Power Plant Efficiency section of the Revised Staff Assessment and agree that the Project will comply with all applicable laws, ordinances, regulations and standards (LORS).

STATE OF CALIFORNIA

Energy Resources
Conservation and Development Commission

In the Matter of:	**DOCKET NO. 09-AFC-07**
Application For Certification for the PALEN SOLAR POWER PROJECT	**DECLARATION OF** Michael Cressner

I, Michael Cressner, declare as follows:

1. I am presently employed by Solar Millennium, LLC, as an Associate, Project Development and Permitting.

2. A copy of my professional qualifications and experience is included herewith (Attachment A to Testimony) and is incorporated by reference in this Declaration.

3. I prepared the attached testimony relating to Power Plant Efficiency for the Palen Solar Power Project (California Energy Commission Docket Number 09-AFC-07).

4. It is my professional opinion that the attached prepared testimony is valid and accurate with respect to issues that it addresses.

5. I am personally familiar with the facts and conclusions related in the attached prepared testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury, under the laws of the State of California, that the foregoing is true and correct to the best of my knowledge and that this declaration was executed on October 5, 2010.

Original Signed
Michael Cressner

PALEN SOLAR POWER PROJECT
RELIABILITY
OPENING TESTIMONY

I. Name: Michael Cressner

II. Purpose:

My testimony addresses the subject of Power Plant Reliability associated with the construction and operation of the Palen Solar Power Project (09-AFC-07).

III. Qualifications:

Michael Cressner: I am presently employed at Solar Millennium LLC, and have been for the past year and am presently an Associate Developer with that organization. I have a Degree in Political Science and I have over 5 years of experience in the development field. I prepared, caused to be prepared, or reviewed the Power Plant Reliability section of the AFC as well as the post-filing information, data responses, and supplemental filings. A detailed description of my qualifications is contained in the attached resume.

To the best of my knowledge all referenced documents and all of the facts contained in this testimony are true and correct. To the extent this testimony contains opinions, such opinions are my own. I make these statements and provide these opinions freely and under oath for the purpose of constituting sworn testimony in this proceeding.

IV. Exhibits

In addition to this written testimony, I am sponsoring the following exhibits in this proceeding.

Exhibit 4	**Palen Solar I, LLC's Data Adequacy Supplement**, dated October 2009, and docketed on October 30, 2009.
Exhibit 11	**Palen Solar I, LLC's Responses to CEC Data Requests Set 1**, dated January 2010, and docketed on January 22, 2010, Response 180.

V. Opinion and Conclusions

I have reviewed the Power Plant Reliability section of the Revised Staff Assessment and agree the Project will generate renewable electricity reliably and will comply with all applicable laws, ordinances, regulations and standards (LORS).

STATE OF CALIFORNIA

Energy Resources
Conservation and Development Commission

In the Matter of:	**DOCKET NO. 09-AFC-07**
Application For Certification for the PALEN SOLAR POWER PROJECT	**DECLARATION OF** Michael Cressner

I, Michael Cressner, declare as follows:

1. I am presently employed by Solar Millennium, LLC, as an Associate, Project Development and Permitting.

2. A copy of my professional qualifications and experience is included herewith (Attachment A to Testimony) and is incorporated by reference in this Declaration.

3. I prepared the attached testimony relating to Power Plant Reliability for the Palen Solar Power Project (California Energy Commission Docket Number 09-AFC-07).

4. It is my professional opinion that the attached prepared testimony is valid and accurate with respect to issues that it addresses.

5. I am personally familiar with the facts and conclusions related in the attached prepared testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury, under the laws of the State of California, that the foregoing is true and correct to the best of my knowledge and that this declaration was executed on October 5, 2010.

Original Signed
Michael Cressner

PALEN SOLAR POWER PROJECT
TRANSMISSION SYSTEM ENGINEERING
OPENING TESTIMONY

I. Name: Michael Cressner

II. Purpose:

My testimony addresses the subject of Transmission System Engineering associated with the construction and operation of the Palen Solar Power Project (09-AFC-07).

III. Qualifications:

Michael Cressner: I am presently employed at Solar Millennium LLC, and have been for the past year and am presently an Associate Developer with that organization. I have a Degree in Political Science and I have over 5 years of experience in the development field. I prepared, caused to be prepared, or reviewed the Transmission System Engineering section of the AFC as well as the post-filing information, data responses, and supplemental filings. A detailed description of my qualifications is contained in the attached resume.

To the best of my knowledge all referenced documents and all of the facts contained in this testimony are true and correct. To the extent this testimony contains opinions, such opinions are my own. I make these statements and provide these opinions freely and under oath for the purpose of constituting sworn testimony in this proceeding.

IV. Exhibits

In addition to this written testimony, I am sponsoring the following exhibits in this proceeding.

Exhibit 1	**Palen Solar I, LLC's Application for Certification Volumes I & II**, dated August 2009, and docketed on August 24, 2009, Section 2.6.

Exhibit 4	**Palen Solar I, LLC's Data Adequacy Supplement**, dated October 2009, and docketed on October 30, 2009.
Exhibit 11	**Palen Solar I, LLC's Responses to CEC Data Requests Set 1**, dated January 2010, and docketed on January 22, 2010, Response 254.
Exhibit 27	**Palen Solar I, LLC's Initial Comments on the Staff Assessment/ Draft Environmental Impact Statement**, dated May 4, 2010, and docketed on May 4, 2010.
Exhibit 44	**Palen Solar I, LLC's Data Responses to Alternatives 2 & 3**, dated July 20, 2010 and docketed on July 20, 2010.
Exhibit 45	**Palen Solar I, LLC's Redacted Phase II Study**, dated July 8, 2010, and docketed on July 28, 2010.

V. Opinion and Conclusions

I have reviewed the Transmission System Engineering section of the Revised Staff Assessment and agree that with incorporation of the Conditions of Certification, the Project will not result in significant impacts and will comply with all applicable laws, ordinances, regulations and standards (LORS). I request one minor modification to the Verification portion of Condition of Certification **TSE-1**. Consistent with the recent Blythe Solar Power Plant Final Decision, I request the following modification to the first line of the Verification.

"Prior to the start of construction ***of the transmission facilities***…"

STATE OF CALIFORNIA

Energy Resources
Conservation and Development Commission

In the Matter of:	**DOCKET NO. 09-AFC-07**
Application For Certification for the PALEN SOLAR POWER PROJECT	**DECLARATION OF** Michael Cressner

I, Michael Cressner, declare as follows:

1. I am presently employed by Solar Millennium, LLC, as an Associate, Project Development and Permitting.

2. A copy of my professional qualifications and experience is included herewith (Attachment A to Testimony) and is incorporated by reference in this Declaration.

3. I prepared the attached testimony relating to Transmission System Engineering for the Palen Solar Power Project (California Energy Commission Docket Number 09-AFC-07).

4. It is my professional opinion that the attached prepared testimony is valid and accurate with respect to issues that it addresses.

5. I am personally familiar with the facts and conclusions related in the attached prepared testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury, under the laws of the State of California, that the foregoing is true and correct to the best of my knowledge and that this declaration was executed on October 5, 2010.

Original Signed
Michael Cressner

BEFORE THE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT COMMISSION OF THE STATE OF CALIFORNIA
1516 NINTH STREET, SACRAMENTO, CA 95814
1-800-822-6228 – WWW.ENERGY.CA.GOV

APPLICATION FOR CERTIFICATION FOR THE *PALEN SOLAR POWER PLANT PROJECT*

Docket No. 09-AFC-7

PROOF OF SERVICE
(Revised 8/27/10)

APPLICANT
Alice Harron
Senior Director of Project Development
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harron@solarmillenium.com

*Michael Cressner, Project Development & Permitting
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Oakland, CA 94709
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AECOM Project Manager
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San Francisco, CA 94105
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INTERVENORS
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c/o Tanya A. Gulesserian,
Marc D. Joseph
Jason W. Holder
Adams Broadwell Joseph & Cardozo
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Center for Biological Diversity
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Los Angeles, CA 90046
ianderson@biologicaldiversity.org

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e-recipient@caiso.com

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Palm Springs-South Coast Field Office
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Palm Springs, CA 92262
CAPSSolarBlythe@blm.gov

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Lisa DeCarlo
Staff Counsel
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Jennifer Jennings
Public Adviser's Office
e-mail service preferred
publicadviser@energy.state.ca.us

*indicates change

DECLARATION OF SERVICE

I, Marie Mills, declare that on October 6, 2010, I served and filed copies of the attached PALEN SOLAR I, LLC'S OPENING TESTIMONY, dated October 6, 2010. The original document, filed with the Docket Unit, is accompanied by a copy of the most recent Proof of Service list, located on the web page for this project at: [http://www.energy.ca.gov/sitingcases/solar_millennium_palen]

The documents have been sent to both the other parties in this proceeding (as shown on the Proof of Service list) and to the Commission's Docket Unit, in the following manner:

(*Check all that Apply*)

FOR SERVICE TO ALL OTHER PARTIES:

__X__ sent electronically to all email addresses on the Proof of Service list;

_____ by personal delivery;

__X__ by delivering on this date, for mailing with the United States Postal Service with first-class postage thereon fully prepaid, to the name and address of the person served, for mailing that same day in the ordinary course of business; that the envelope was sealed and placed for collection and mailing on that date to those addresses NOT marked "email preferred."

AND

FOR FILING WITH THE ENERGY COMMISSION:

__X__ sending an original paper copy and one electronic copy, mailed and emailed respectively, to the address below (***preferred method***);

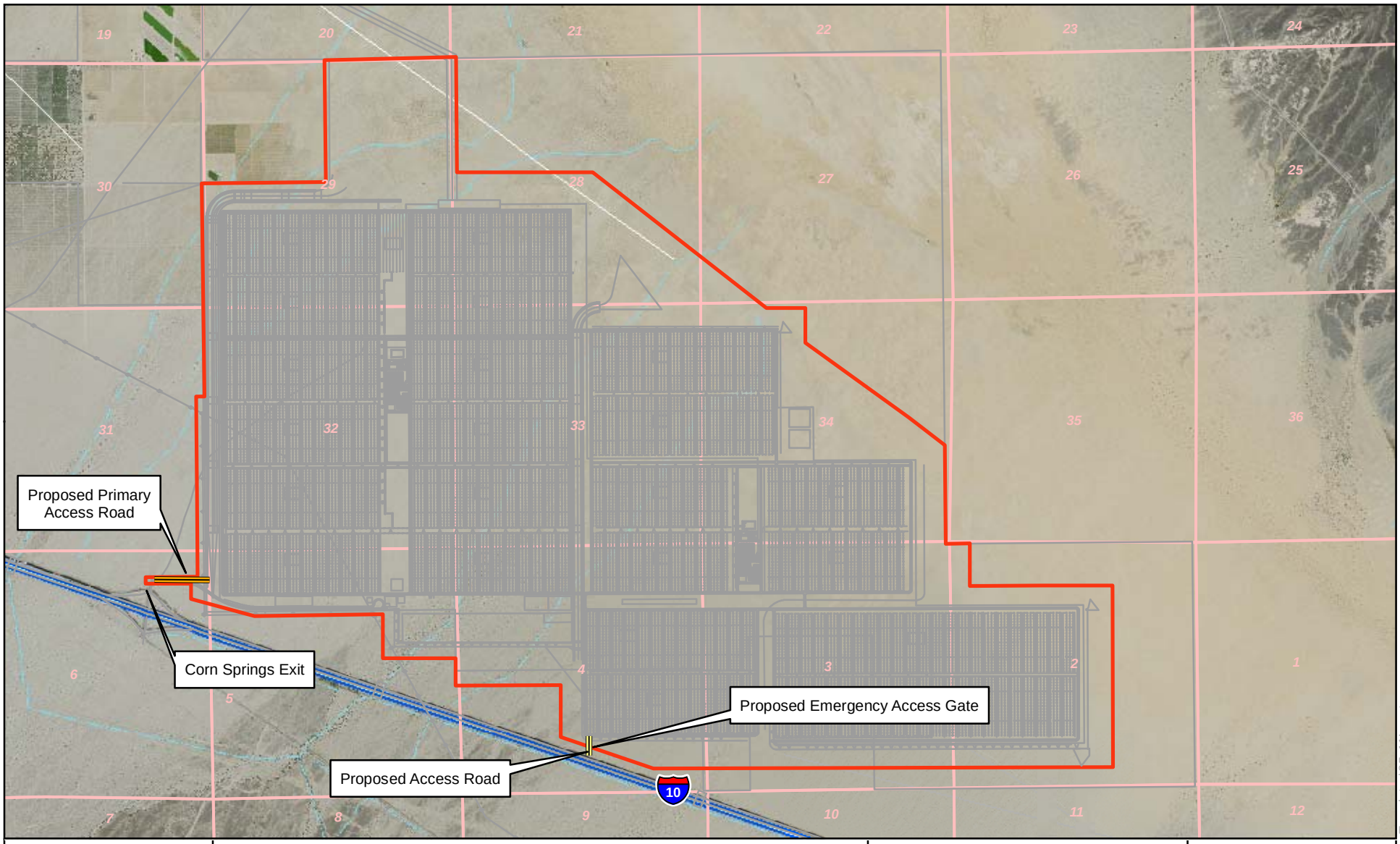
OR

_____ depositing in the mail an original and 12 paper copies, as follows:

CALIFORNIA ENERGY COMMISSION
Attn: Docket No. 09-AFC-7
1516 Ninth Street, MS-4
Sacramento, CA 95814-5512
docket@energy.state.ca.us

I declare under penalty of perjury that the foregoing is true and correct, that I am employed in the county where this mailing occurred, and that I am over the age of 18 years and not a party to the proceeding.

Marie Mills



Map Location

Legend

- Proposed Emergency Access Road
- Palen Solar Power Project Right-of-Way
- Section Lines

Data Sources:
Air Photo, NAIP, 2009
Basemap, (Roads, streams, cities), ESRI

0 0.5 1 Miles

1 in = 3,000 feet

0 3,000 6,000 Feet

Palen Solar Power Project

Figure
Secondary Emergency Access
Alternative 2

Palen Solar I, LLC

AECOM

Project: 60139694-5230
Date: July 2010

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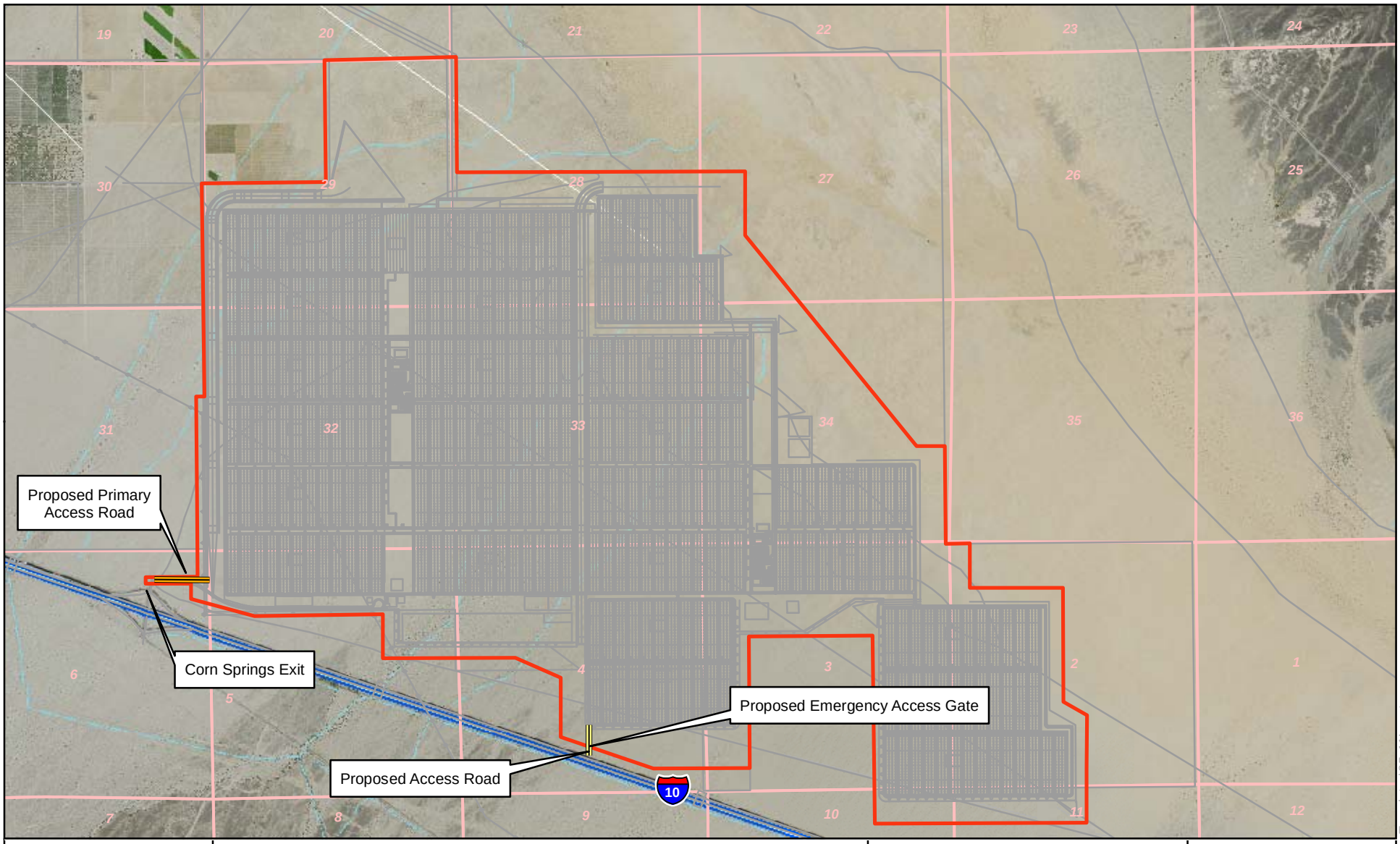

Map Location

Legend

- Proposed Emergency Access Road
- Palen Solar Power Project Right-of-Way
- Section Lines

0 0.5 1 Miles

1 in = 3,000 feet

0 3,000 6,000 Feet

Data Sources:
Air Photo, NAIP, 2009
Basemap, (Roads, streams, cities), ESRI

Palen Solar Power Project

Figure
Secondary Emergency Access
Alternative 3

Palen Solar I, LLC

AECOM

Project: 60139694-5230
Date: July 2010

Y:\Projects\Solar_Millennium\Figure_Templates\85x11L.mxt

Attachment A

Resumes

MICHAEL CRESSNER
cressnerm@gmail.com

EDUCATION

Kenyon College, Gambier, OH
Bachelor of Arts in Political Science, May 2005

WORK EXPERIENCE

Solar Millennium, LLC, Oakland, CA
November 2009 – Present, Associate Project Developer, Development & Permitting
Manage the 500 MW Palen Solar Power Project
Assisted in development and permitting of the 1,000 MW Blythe Solar Power Project
Manage NEPA and CEQA permitting process and related regulatory filings
Oversee and negotiate project related real estate transactions and acquisitions
Coordinate project environmental mitigation implementation including compensatory land acquisitions as well as water and air-quality offsets
Manage and negotiate project environmental, engineering, real estate, and construction-related consultant contracts
Coordinate internal corporate project activities related to engineering/design, transmission, project financing, construction, project legal, and public relations
Conduct community and public agency outreach

Citizens Housing Corporation, San Francisco, CA
October 2005 - February 2009, Associate Project Manager
Led cross-departmental transition process for new projects from construction through closeout
Managed entitlement, environmental approvals, and building permit processes for projects
Coordinated project LEED, GreenPoint and PV system accreditation process
Conducted financial feasibility analyses and managed capital improvements for existing projects
Negotiated and administered general contractor and project consultant contracts
Managed project budgets and consultant teams throughout all phases of project development
Secured public and private project financing ($100K - $20M)
Participated in negotiations and completed due diligence for financing and partnership closings
Negotiated option-to-lease and ground lease agreements
Managed project schedules, reporting, and documentation for corporate departments, project partners, and public agencies
RFQ/RFP preparation and submission
Conducted community and public agency outreach
Market and new deal financial analysis as well as regulatory and financial resources research

Cressner & Associates, Inc., Commercial Real Estate Appraisal, Los Angeles, CA
Summer 2004 and May – October 2005, Appraisal Associate
Completed market research and market data analysis

County of Los Angeles Community Development Commission (LACDC), Los Angeles, CA
Summer 2002 and 2003, Internship

Rep. Henry Waxman (30th US Congressional District), Los Angeles, CA
Summer 2003, Congressional Intern

JENNIFER GUIGLIANO, CPESC, CPSWQ, CESSWI, EIT, REA
Project Director
Senior Environmental Scientist

EDUCATION

ME, Environmental Engineering, Pennsylvania State University, University Park, 1996

BS, Combined Science, Santa Clara University, Santa Clara, California 1994, Minor Biology; Minor Environmental Studies

Post-Graduate Researcher, Environmental Microbiology, University of California at Santa Barbara, 1998

REGISTRATIONS

2008, Certified Erosion, Sediment, and Storm Water Inspector (CESSWI) (Certification No. 0018)

2006, Certified Professional in Erosion and Sediment Control (CPESC) (Certification No. 3613)

2005, Registered Environmental Assessor (REA I No. 08037)

2004, Certified Professional in Storm Water Quality (CPSWQ) (Certification No. 0085)

1997, Engineer-in-training (EIT), California (License No. XE103188)

PROFESSIONAL AFFILIATIONS

Associate Member of Sigma XI, Scientific Research Society

Urban Land Institute

International Erosion Control Association

Women's Environmental Council

HONORS

Marketing Incentive Award (Tetra Tech 2003)

"SMILER-Spirit, Motivate, Inspire, Lead, Encourage, Results" Awards (Tetra Tech 2002, 2003)

CERTIFICATIONS

1997, EPA's Water Treatment Operator Course Certificate

2002, Wetland Delineation Training Certificate, Wetland Training Institute

2003, Storm Water Pollution Prevention Plan (SWPPP) Certificate, SWPPP Training Seminar by the Building Industry Association and San Diego County Copermittees

2003, California Storm Water Quality Association (CASWQA) Best Management Practices Handbook Training Seminar

Hazardous Waste Operations and Emergency Response, 29 CFR 1910.290, 40-hour Certification

Hazardous Waste Operations, Manager/Supervisor Training, 29 CFR 1910.120, 8-hour Certification

U.S. Fish and Wildlife Service Endangered Species Recovery Permit

Coastal California Gnatcatcher, In Progress

Least Bell's Vireo, In Progress

Southwestern Willow Flycatcher, In Progress

American Red Cross Adult CPR Certification and First Aid Certification, 2006

DOT Training for Offerors of Bulk and Non-bulk Hazmat Packages - 2003 Security Updates

Ms. Guigliano is an engineer and project manager with over 12 years of experience working in environmental engineering and resource management, including storm water, wastewater, and natural resources management, and site assessment projects. She is an expert in managing large integrated projects and has prepared many plans and reports, including integrated natural resources management plans, integrated pest management plans, CEQA/NEPA documents, water quality technical reports, agency permit applications and processing, biological resources reports, and storm water management and pollution prevention plans. Ms. Guigliano has extensive experience in the fields of water quality and natural resources management. She has experience working with a diversity of clients including private, tribal, municipal, state, and federal entities. Her responsibilities and experience have included project and field management; Phase I site assessments; environmental monitoring; biological site assessments; watershed assessments; ecological risk assessment sampling; wastewater treatment plant sampling and evaluations; storm water compliance and management, storm water treatment design, NPDES program implementation, erosion control projects; water management issues; groundwater monitoring; and spill prevention, contingency, and countermeasure plans.

Ms. Guigliano is the Technical Vice Chair for the CPESC, Inc. CPSWQ Executive Committee (Board), on the Technical Advisory Committee for the CPESC, Inc. Certified Erosion, Sediment, and Storm Water Inspector (CESSWI) program, and is on the Executive Committee for the Urban Land Institute (ULI) San Diego/Tijuana and is the Sustainability Committee Chair for ULI San Diego/Tijuana.

Ms. Guigliano is also the EDAW Corporate Director of Health and Safety and has developed the Health and Safety Program for the firm including policies and procedures. She is responsible for implementation of the program and representation of EDAW at the AECOM corporate level.

EROSION AND SEDIMENT CONTROL AND STORM WATER MANAGEMENT

Westside Parkway Storm Water Design, Bakersfield, CA
Project Manager/Engineer
CLIENT: DMJM Harris/City of Bakersfield
EDAW is responsible for the design of effective temporary and permanent erosion control and sediment control measures and storm water management Best Management Practices (BMPs) for the Westside Parkway. Ms. Guigliano is responsible for managing the storm water and erosion/sediment control aspects of the design including preparation of Water Pollution Control Plans, Erosion and Sediment Control Plans, and multiple Storm Water Data Reports (SWDRs) for the proposed alignments.

Storm Water Management and Erosion Control, Honolulu, HI
Project Scientist/Engineer
CLIENT: Caltrans
Ms. Guigliano is providing technical guidance regarding storm water management and erosion control for the City and County of Honolulu in coordination with AECOM Water. Ms. Guigliano's responsibilities include the preparation of two white papers on the technical issues of erosion and sediment control modeling and numeric standards for municipalities, review and comment on Revised Universal Soil Loss Equation (RUSLE) as applicable to Hawaii, attendance at a focus group meeting regarding the municipal standards, and preparing and delivering a training to municipal staff on the

erosion control and the use of RUSLE2. Ms. Guigliano is also preparing an Erosion Prediction Guidelines (EPG) Manual and a revised RUSLE2 program for the City/County for use in project analysis during the project development phase. The EPG and revised RUSLE2 program will be incorporated into the development guidelines an include input and review by the Natural Resources Conservation Service (NRCS).

Erosion Prediction Procedure and Caltrans RUSLE2 Development, CA
Project Manager, Project Manager
CLIENT: Caltrans
Ms. Guigliano is the project manager in charge of preparing an Erosion Prediction Procedure (EPP) and a modified RUSLE2 program for the California Department of Transportation. The project includes research and recommendations in to maximum allowable erosion rates (MAER), modification of databases to accommodate appropriate Best Management Practices for construction sites, revising the management practices database structure in the Caltrans RUSLE2 program, and redefining default values and options for preconstruction conditions. Ms. Guigliano also developed the training materials for the EPP for Caltrans. Ms. Guigliano conducted 2 BETA training classes for Caltrans to introduce the training program and address comments or concerns for program improvement. The initial project included preparation of the EPP Manual, modification of the Revised Universal Soil Loss Equation (RUSLE2) program, development of the training program, and 2 training sessions. Subsequent tasks involved more in-depth refinement of the program and the EPP manual.

Bioswale Design and Water Quality Technical Report, San Diego, CA
Project Manager
CLIENT: Sudberry Properties
Ms. Guigliano prepared a water quality technical report and designed a large bioswale system for a large-scale development known as Quarry Falls in San Diego, California. The project includes mixed-use development of over 230 acres that are currently mined for aggregate. The project required innovative approaches to storm water management to integrate storm water principles with multi-use open space and park designs. The bioswale concept includes the coupling of storm water treatment with active and passive recreational areas and incorporates links to the native habitat in the area including the San Diego River. The project included preparation of a Water Quality Technical Report as required by the San Diego Municipal Permit.

ENVIRONMENTAL COMPLIANCE

Beacon Solar Energy Project, Kern County, CA
Project Director
CLIENT: NextEra Energy Resources
Ms. Guigliano is the Project Director for environmental compliance components of a proposed 250-megaWatt solar project located in Kern County, California. The project has submitted an Application for Certification (AFC) with the California Energy Commission (CEC) and is processing associated technical studies to support the data requests. Responsibilities include strategic coordination of biological compliance, land use, socioeconomics, cultural resources, and storm water/flood plain management requirements including preparation and review of technical documents (technical studies, permit applications, and management and mitigation plans), coordination and negotiation with agencies including the USFWS, CDFG, RWQCB, Federal Emergency Management Agency (FEMA), CEC, and coordination and oversight of the project team including biological resources, land use, socioeconomics, cultural resources, and engineering and design. Biological areas of concern include general biological resources (wildlife and vegetation), special status species (Mojave ground squirrel, desert tortoise, and burrowing owl), jurisdictional waters, raven management, and water

quality and ecological risk assessment for migratory birds. Other key responsibilities include strategic coordination of storm water and flood plain management components of the project including hydrology and hydraulics modeling and analyses, sediment transport studies and modeling, storm water management approach development, FEMA processing of the Conditional Letter of Map Revision (CLOMR) and Letter of Map Revision (LOMR), and coordination with relevant agencies including FEMA, the RWQCB, CDFG, and the CEC.

Construction Site Environmental Compliance, MCB Camp Pendleton, CA
Environmental Manager
CLIENT: Pacific General/TC Construction
Ms. Guigliano provided construction site environmental compliance oversight for Pacific General, Inc. followed by TC Construction, the prime contractors, who installed a raw water pipeline at MCB Camp Pendleton and MCAS Camp Pendleton. The project involved providing training and oversight for environmental concerns on the project including hazardous waste and hazardous materials management, storm water management, spill prevention, and biological and cultural resources. This was a high-profile project due to its location along the main road on-base.

BIOLOGICAL ASSESSMENT/NATURAL RESOURCES MANAGEMENT

Caltrans District 7 On-Call US-101 Wildlife Connectivity Analysis (07A2329), Ventura and Los Angeles, CA
Project Manager
CLIENT: California Department of Transportation, District 7
Ms. Guigliano is the Project Manager for this on-call contract with District 7. The purpose of this project is to evaluate the potential effects of current and future capital transportation projects on wildlife, particularly medium and large mammal, movement across U.S. Route 101 (US-101) within Caltrans District 7 (D7). The goal of this task order is to support D7 with the analysis of the US-101 for wildlife crossing opportunities through the implementation of a wildlife corridor analysis and engineering Feasibility Study (FS) of appropriate crossing locations and designs to accommodate wildlife movement across the highway. This work may involve wildlife movement studies including road kill and tracking surveys, habitat and wildlife linkages/corridor studies, economic cost/benefit analyses, and alternatives analyses to properly assess potential impacts and mitigation of current and proposed projects.

The project area of interest is located on the US-101 between State Route (SR) 23 and SR 27, generally from Post Mile (PM) 00.0 to PM 38.2. This area is located between the Simi Hills to the north and the Santa Monica Mountains to the south, where wildlife connectivity issues between the two linkages are known to persist.

To successfully complete this project, several activities are necessary to evaluate the current and potential future status of wildlife movement across the US-101 and determine the steps Caltrans should consider to improve wildlife connectivity to the extent feasible. These activities are:

Activity 1 Literature and Data Review
Activity 2 Data Gap Analysis
Activity 3 Study Design Preparation
Activity 4 Study Design Implementation
Activity 5 Constraints Analysis
Activity 6 Engineering Feasibility Study and Cost Estimate

JENNIFER GUIGLIANO

Mesquite Regional Landfill Biological Compliance, Imperial County, CA
Project Manager
CLIENT: Sanitation Districts of Los Angeles County
Ms. Guigliano is the Project Manager for a large biological compliance project for the Mesquite Regional Landfill project with the Los Angeles County Sanitation Districts. This project involves the construction of a new landfill in Imperial Valley and compliance with environmental regulations and mitigation requirements defined in a Biological Opinion, Conditional Use Permit, and other environmental compliance documents. The services include general regulatory assistance and agency coordination, burrowing owl impact assessment and avoidance, habitat monitoring (breeding birds, small mammal trapping, and vegetation transects), desert tortoise population monitoring, raven monitoring, development of contractor specifications for biological conditions, providing design considerations to minimize impacts to resources, spill contingency planning for rail spur and rail transport activities, and other as-needed services to facilitate compliance with biological requirements. Ms. Guigliano also provides Project Environmental Awareness Training for LACSD and their contractors on the project.

Biological Resources Surveys, Burrowing Owl Surveys, and Wetland Delineations, Imperial County, CA
Task Manager
CLIENT: Westshore Development
Ms. Guigliano conducted biological resource surveys, including habitat classification and species surveys, on two large (greater than 1,500 acre) agricultural sites in Imperial County, California. The properties are part of two separate large scale development master plan areas. The sites are proposed as mixed use land plans consisting of commercial/retail, varying density residential uses and passive/active recreation uses. Surveys included burrowing owl surveys in accordance with the California Burrowing Owl Consortium guidelines and wetland delineations in accordance with the USACE 1987 Wetland Delineation Manual.

Borax Mining, Boron, CA
Biologist
CLIENT: NA
Ms. Guigliano monitored the area behind the mining location for desert tortoise habitat and population. The protected tortoise habitat is threatened by the moving earth masses that result from the mining activities. Work involved marking grids for future monitoring checks, identifying burrows, and relocating tortoises.

ENVIRONMENTAL PLANNING AND PERMITTING

Agua Hedionda and Calavera Creeks Dredging and Improvements Project, Carlsbad, CA
Project Manager
CLIENT: City of Carlsbad
Ms. Guigliano is directing the environmental and engineering team in the preparation of the EIR including environmental studies and technical documents for the proposed dredging and design improvements for Agua Hedionda and Calavera creeks. The project includes channel dredging, the removal and modification of an existing weir wall structure, outlet modifications, hydraulic improvements, and bank stabilization. Ms. Guigliano is responsible for the day-to-day coordination with the team, reviews technical content, provides guidance to staff, and maintains control of the project schedule and budget. Ms. Guigliano is also responsible for the acquisition of necessary environmental permits for the project including the preparation of permit applications, preparation of mitigation recommendations, and leading negotiation efforts to obtain various permits from the regulatory agencies

including a Coastal Development Permit, and the USACE 404, RWQCB 401, and CDFG 1600 permits.

El Monte Restoration Environmental Impact Report, Lakeside, CA
Project Manager
CLIENT: El Capitan Golf Club
Ms. Guigliano is the project manager for a Subsequent EIR and associated technical studies and acquisition of a Major Use Permit, for approximately 460 acres in the upper San Diego River that are currently approved as a golf course. The project includes preparation of the Reclamation Plan and a Subsequent EIR to address potential impacts associated with changing the plan of development from a golf course to a restoration site. Restoration would include the removal of approximately 10 percent of the aggregate material in the river channel to return the channel bottom closer to the groundwater level. The removal of aggregate would be sold to help pay for the restoration effort. Restoration would include creation of new habitats including cottonwood/willow riparian, oak woodland, and an upland/alluvial scrub community. This project also includes the acquisition of appropriate permits from the regulatory agencies including the USACE 404, RWQCB 401, CDFG 1600, and storm water permits with the SWRCB

Angie Harbin-Ireland
Senior Biologist + Project Manager

Education
M.S., Conservation Ecology, University of California, Davis, 2004
Habitat Evaluation Procedures Certification, Virginia Polytechnic Institute and State University, Blacksburg, 2002
B.S., Wildlife, Fish, and Conservation Biology, University of California, Davis, 1998

Accreditation
Recovery Permit # TE-094845-0 for California Tiger Salamander
PADI Divemaster #240135
American Association of Underwater Scientists

Affiliations
Member, The Wildlife Society, Western Section
Member, Raptor Research Foundation
Member, Estuarine Research Federation
Member, Association of Environmental Professionals

Specialized Training
2002 CEQA Basics, Grassetti Environmental Consulting
2002 Legal and Regulatory Foundation for Managing Aquatic Ecosystems, UC Berkeley Extension
2003 California Tiger Salamander Workshop, Western Section of the Wildlife Society
2003 California Burrowing Owl Symposium, Western Section of the Wildlife Society
2003 Endangered Species Act and Habitat Conservation Planning, CLE International
2005 Spring CEQA Update, Association of Environmental Professionals
2006 Endangered Species Act, CLE International
2007 Alameda Whipsnake Workshop, Alameda County Conservation Partnership

Publications + Technical Papers
Diablo Firesafe Council Best Management Practices Development. Contra Costa County, California. October 2008.
Federal Biological Assessment For The Creekside Memorial Park. Corrie Development Corporation. Contra Costa County, California. June 2008.
CCWD Canal Replacement Project ASIP. Contra Costa County. March 2007.
East Cypress Corridor Property Owners Project Description and Application for USACE Individual Permit. Oakley, California. May, 2006.
East Cypress Corridor Specific Plan Draft EIR. Chapter 3.5 - Biological Resources. Oakley, California. August, 2005.
Biological Assessment and Preliminary Jurisdictional Determination for the Proposed Yountville Inn Expansion Project, Yountville, Napa County, California. July, 2005.
Effects of Oyster Mariculture on the Benthic Invertebrate Community in Drakes Estero, Point Reyes National Seashore, California, Master's Thesis, University of California, Davis. 2004.
Cypress Grove Project - Swainson's Hawk Foraging Habitat Analysis. March 2003.
Potential Changes in Avian Community Composition with Conversion of Oak Woodlands to a Residential Development at the Proposed Franklin Canyon Project Site, Hercules, Contra Costa County, California. October 2002.
Rejmankova, Eliska, Angelique Harbin-Ireland, and Michele Lege. “Bacterial abundance in larval habitats of four species of Anopheles (Diptera: Culicidae) in Belize, Central America.” Journal of Vector Ecology, December 2000

Angie Harbin-Ireland is a senior biologist with AECOM. She has worked on multiple biological resource projects of various scale within in California as a technical specialist and project manager for natural resource studies, CEQA and NEPA review, regulatory permitting, and mitigation planning. She draws upon her broad experience in regulatory permitting, wetlands, wildlife, and conservation ecology to develop feasible and collaborative solutions to complex land use planning issues. She has extensive knowledge of the listed species and protected habitat types in the state of California as well as local natural resource protection policies.

Angie has over ten years of experience in conducting habitat assessments and surveys for special-status species such as the California red-legged frog, western burrowing owl, Swainson's hawk, California tiger salamander (for which she holds a U.S. Fish and Wildlife Service recovery permit), peregrine falcon,

spotted owl, giant garter snake, Alameda whipsnake, and San Joaquin kit fox. She has extensive experience in sampling of wetland, marine, and intertidal and sub tidal invertebrate communities. She has 12 years of experience with raptor field study and identification, having conducted long-term raptor population and behavioral studies, including extensive field work.

Angie has overseen the development of several resource management and mitigation and monitoring plans, managed western burrowing owl passive relocation efforts, and California tiger salamander salvage, including installation of pitfall traps and relocation of the salamanders to mitigation sites. She integrates her biological understanding with regulatory compliance, submittals, and agency negotiations for species including California tiger salamander, California red-legged frog, San Joaquin kit fox, western burrowing owl, Alameda whipsnake, vernal pool fairy shrimp, giant garter snake, fisheries, salt marsh harvest mouse, California clapper rail, California freshwater shrimp, California least tern, brown pelican, desert tortoise, Mojave fringe toed lizard, and rare plants. In preparing the biological resources sections of program and project-level CEQA and NEPA documents, she is involved in local, state, and federal agency biological resource impact evaluations, coordination, planning, and presentations at public meetings. She coordinates with contractors, engineers, and agencies on construction projects regarding natural resources and permit compliance.

Project Experience

Solar Millennium, Blythe/Palen/Ridgecrest Application for Certification and Engineering Support, California

AECOM has been retained by Solar Millennium, LLC to provide permitting and engineering support services for three proposed solar thermal power projects in Southern California. Each project ranges from approximately 250 to 1,000 MW. AECOM assisted Solar Millennium in submitting AFCs to the CEC for each of the three projects, including responding to data requests. The projects will be developed on federal land managed by the U.S. Bureau of Land Management (BLM), which is the lead federal agency for permitting purposes. The three projects have been identified as “fast track” projects by the BLM, and are being permitted on an expedited timeline in order to be eligible for stimulus funding.

In support of the projects, AECOM has performed required field surveys including natural resource surveys and is supporting Solar Millennium in providing related documentation and regulatory agency submittals, as well as resolving technical and regulatory agency issues pertaining to endangered species and cultural resources. AECOM is also supporting environmental analyses in the other resource areas, such as air quality and public health modeling of construction and operation emissions and permitting, visual simulations, groundwater modeling, socioeconomic IMPLAN modeling, waste management, worker safety, etc.

As elements of the licensing and engineering scope, AECOM is also managing geotechnical and groundwater development investigations, developing the projects' civil design basis, and providing engineering support for substation and transmission line design. The projects will be instrumental in fulfilling Governor Schwarzenegger’s executive order to California utilities to obtain 33 percent of electrical energy from renewable resources by 2020. Angie has been assisting with project mitigation planning for sensitive resources, leading authoriship of the Habitat Mitigation and Monitoritng Plans. She has also assisted with CEC data responses and coordinating field survey efforts.

PV Solar Project, Weldon, Kern County, CA
AECOM conducted site reconnaissance surveys and habitat mapping for three parcels in eastern Kern County to assess constraints and opportunities for proposed photovoltaic solar developments by Renewable Resources Group.

Vegetation communities, potential federal and state jurisdictional wetlands, and potential habitats for sensitive species occurring in the region were evaluated. Habitats evaluated include rabbit brush scrub, irrigated pasture, non-native annual grassland, and wetland areas. AECOM is working with the client to develop a constraints based site plan based on regulated biological and cultural resources. Technical reports are being provided to support the County's CEQA evaluation for the proposed project. Angie is the lead biologist.

PV Solar Project, Rosamond, Kern County, CA
AECOM conducted site reconnaissance surveys and habitat mapping for approximately 5,000 acres in the Antelope Valley to assess constraints and opportunities for proposed photovoltaic solar developments by Renewable Resources Group. Vegetation communities, potential federal and state jurisdictional wetlands, and potential habitats for sensitive species occurring in the region were evaluated. Habitats evaluated include various scrub habitats and agricultural uses. AECOM is working with the client to develop a constraints based site plan based on regulated biological and cultural resources and has conducted focused surveys for rare plants and desert tortoise. Technical reports are being provided to support the County's CEQA evaluation for the proposed project. Angie is the lead biologist.

Yerba Buena Island Ramps Improvement Project, CA
For the proposed freeway ramp improvement project on Yerba Buena Island, Angie and her colleagues are assisting the City of San Francisco and Transportation Authority with the environmental review process to secure NEPA compliance. As lead biologist, Angie led the biological surveys, impact analysis, reporting, and mitigation planning effort for the various ramp design alternatives. The project site is located on an island in San Francisco Bay therefore sensitive biological resources that are being evaluated include marine mammals, waterbirds such as brown pelican and double-crested cormorant, fisheries, and peregrine falcon. She and her team are completing a comprehensive Natural Environment Study for approval by CalTrans.

Robert Louis Stevenson and Surrounding Lands Interim Management Plan, Napa/Sonoma County, CA
AECOM is preparing an Interim Management Plan for the Land Trust of Napa County consisting of baseline conditions of 12,000 acres of diverse terrain at the north end of the Napa Valley form a continuous open space assemblage, setting forth an array of management and operations options for the assemblage to be implemented over time. The interim plan will allow for transfer of the lands from the Trust to a permanent ownership and management entity that will serve to implement long term planning and design initiatives. Angie is serving as lead biologist.

County of Marin Bridge Maintenance Program, Marin County, CA
The County of Marin has 64 bridges throughout the County which are inspected every year by CalTrans. Upon inspection in 2005, CalTrans concluded that severe weather over the past twenty years had caused substructure and superstructure damage to a total of 38 bridges. Ms. Harbin-Ireland and the project team worked with the County of Marin and Harris Associates to identify those bridges which needed immediate repair, and to prepare a Biological Assessment, a wetland delineation and jurisdictional determination, permit applications, a detailed project description, and a Mitigated Negative Declaration under the California Environmental Quality Act. In an extremely short period of time, the project team was able to coordinate a site visit and receive all the necessary permitting documentation from four separate agencies, including a Biological Opinion from the NOAA Fisheries, for the emergency repair of one of the bridges. As lead biologist, Angie oversaw the biological and wetlands assessment work

and development of special-status species avoidance measures.

Santa Clara Valley Water District Habitat Assessment for California Red-Legged Frog, CA
AECOM conducted a protocol-level Site Assessment for the California red-legged frog *(Rana aurora draytonii)*, federally listed threatened, and a California Species of Special Concern, along five creeks managed by the Santa Clara Valley Water District in Santa Clara County. U.S. Fish and Wildlife Service protocols were implemented to evaluate potential aquatic, breeding, and dispersal habitats on site and within five miles of the study areas. The habitat assessment was conducted using aerial photos and field surveys. Data from the habitat assessment was analyzed using a GIS platform, and stream reaches and pond features were evaluated for suitability and quality by modeling various criteria, consistent with the California red-legged frog Primary Constituent Elements as described by the USFWS in the critical habitat designation. The quality of aquatic breeding and non-breeding habitat was evaluated and found to vary due to the presence of predatory species, physical limitations of the habitat, and connectivity to known occurrences or other potentially suitable habitat locations. An evaluation of surrounding aquatic features, dispersal habitats, documented populations, and upland habitat suitability was completed for the regional vicinity of each study area. Additional survey recommendations were made for project activities in the five study areas based on the habitat suitability and regional habitat and population analysis. In her role as project manager and lead biologist, Angie oversaw development of the field methodology and implementation and provided guidance on the habitat analysis and production of the draft report.

East Cypress Corridor Property Owner and Contra Costa Water District Permitting and Mitigation Planning, Holland Tract, CA
As part of the regulatory permitting and agency approval process for the Contra Costa Canal Replacement project and the East Cypress Corridor Specific Plan development a comprehensive wetland and species mitigation solution was necessary to satisfy mitigation requirements for wetland and habitat impacts. AECOM worked collaboratively with the project proponents, local landowners, and Wildlands, Inc. to identify suitable off site properties which were evaluated for their preservation, habitat enhancement, and wetland creation potential. We coordinated the completion of multi-disciplinary constraints studies for biological and cultural resources, hydrology, geology, and hazardous materials for properties located on Holland Tract and west of Clifton Court Forebay.

Negotiations with the local Reclamation District, regulatory agencies, land owners, and various mineral rights and other easement holders were facilitated by AECOM. All constraints and opportunities were accounted for to achieve a feasible and acceptable wetland and species habitat creation plan and long-term management plan at Holland Tract, satisfying the mitigation needs for both project proponents. An operations and management plan was prepared for the potential preservation site near Byron which is a representation of rare alkali and vernal pool habitats in the region. Angie served as the project manager and lead biologist for these efforts for the Contra Costa Water District and East Cypress Corridor Developers.

Diablo Firesafe Council Best Management Practices Development, Contra Costa County, CA
AECOM worked with the Diablo Firesafe Council and U.S. Fish and Wildlife Service to develop a guidebook designed to familiarize land managers, homeowners, and communities in Contra Costa County with the most effective hazardous fuel treatment types suited for their landscapes. The guidebook also provides guidelines for protecting sensitive species and their habitats during implementation. Our guidelines take the form of best management practices, designed to streamline compliance with federal natural resource laws for small-

scale hazardous fuel treatment projects, and are intended as a useful resource for a variety of audiences implementing hazardous fuel treatment projects in the County. Angie served as the Project Manager and technical expert in developing BMP's for federally protected species.

Concord Naval Weapons Station Biological Surveys, Concord, CA
For the United States Navy, AECOM conducted surveys for federally listed vernal pool branchiopods, along with habitat mapping and nocturnal surveys for California tiger salamander prior to the reuse of the base. Approximately 2,500 acres of the reuse area was thoroughly surveyed for upland habitat elements including small mammal burrows which could be used by aestivating California tiger salamanders. Survey results were compiled into an extensive GIS database identifying concentrations of upland habitat, with special emphasis on habitat relative to potential breeding ponds. In addition, aquatic features with potential to support vernal pool branchiopods were identified and surveyed according to US Fish and Wildlife Service protocol. This information will be used for constraints-based planning of base reuse. Angie conducted nocturnal salamander surveys and provided guidance on habitat survey methodology, design, and constraints analysis strategy.

East Dublin Specific Plan and Supplemental EIR, City of Dublin, CA
AECOM conducted comprehensive biological resource studies and analyses for approximately 1,100 acre project site for the City of Dublin. The project involved several landowners and a host of resource, engineering, CEQA, and permitting issues. We created GIS biological resource constraints layers, coordinated with city and stakeholders to achieve constraints-based planning, prepared Mitigation and Monitoring Plans, and designed mitigation features. The team conducted focused surveys for rare species including California tiger salamander, California red-legged frog, western burrowing owl, and vernal pool and special-status wildlife and rare plant species. We consulted with the USACE, USFWS, NOAA Fisheries, RWQCB, and the CDFG. Angie conducted habitat assessments and focused surveys for rare species including California tiger salamander, California red-legged frog, western burrowing owl, San Joaquin kit fox, and rare plant species. Surveys determined that California tiger salamander, California red-legged frog, and western burrowing owl inhabited the site. She observed all California tiger salamander life history stages and observed adult California red-legged frog on site.

Contra Costa Water District Canal Replacement Project, Oakley, CA
For the approximate 4-mile long Contra Costa Canal Replacement project, Angie coordinated the assessment of potentially occurring special-status plant and wildlife species and all necessary focused follow-up surveys for the Contra Costa Water District. She has conducted an evaluation of the suitability and quality of existing on-site habitats and is one of the lead authors for the project Action Specific Implementation Plan (ASIP) being completed in compliance with the CalFed Multi Species Conservation Strategy. As part of the ASIP process she has identified potential project effects on listed species and NCCP habitats and negotiated appropriate avoidance and mitigation measures with the USACE, Bureau of Reclamation, CDFG, and USFWS. She assisted in coordinating the wetland and species mitigation planning efforts with the agencies and other stakeholders.

CCWD On-Call Biological Services, Contra Costa County
AECOM conducted biological surveys and habitat assessments for sensitive resources within Contra Costa Water District (CCWD) lands as needed. Typical tasks included pre-construction surveys prior to standard operations and maintenance activities, agency coordination, and burrowing owl relocation.

Angie served as the main point of contact and project manager for this work.

On-Call Biological Services, Contra Costa County, CA
AECOM conducted third party peer reviews of various biological resource evaluations and surveys on behalf of Contra Costa County. Site visits to review conditions were conducted and reports and memos provided of results and additional recommendations for CEQA and regulatory compliance as needed. Angie served as the main point of contact and project manager for this work.

Marin County Department of Public Works Drainage Culverts Clearing, Marin County, CA
AECOM assisted the Marin County Department of Public Works with biological resource evaluations for the maintenance and upgrading of forty-nine drainage culverts and portions of associated drainages along a linear corridor in western Marin County. A biological resources assessment of the study corridor was conducted to assess the potential for the occurrence of special-status plant or animal species, and sensitive vegetation communities within the areas to be affected by the project. In addition to the biological resources assessment, biologists conducted a formal wetland delineation and jurisdictional determination to identify the extent of waters of the U.S. falling under the jurisdiction of the U.S. Army Corps of Engineers within each of the project work areas. Also identified were potential waters of the State of California, which fell under the jurisdiction of the California Department of Fish and Game and/or the Regional Water Quality Control Board. As a biologist, Angie provided an analysis of impacts to regulated resources, recommendations for avoidance and minimization of impacts to sensitive biological resources, and pre-permit application agency coordination.

Vaquero Farms Mitigation Planning, Brentwood, CA
The project team led the mitigation planning effort for the Vineyards at Marsh Creek Development Project at the 936-acre Vaquero Farms mitigation site for Blackhawk Services & Nunn. Mitigation implementation included creation of five wetlands totaling 1.6 acres created for the benefit of California tiger salamander and California red-legged frog and occurred in occupied California red-legged frog and western burrowing owl habitat. The construction work required careful consideration for protection of these sensitive species including full-time construction monitoring and multiple protective measures to prevent take from occurring. As project manager, Angie oversaw and conducted protocol-level surveys and impact analyses for special-status species including California tiger salamander (adults and larvae observed), vernal pool crustaceans, western burrowing owl, California red-legged frog, rare plants, and San Joaquin kit fox. In addition, she performed pre-construction surveys for Swainson’s hawk, California red-legged frog, western pond turtle, special-status bats, San Joaquin kit fox, and western burrowing owl. Further, Angie conducted burrowing owl passive relocation and created a Salvage Plan for California tiger salamander eggs and larvae. In addition, she provided on-site environmental compliance monitoring inspections of erosion, undesired water-ponding, exclusion fencing, construction fencing, contractor education, and construction activities. This project is on-going with respect to monitoring of California red-legged frog and California tiger salamander populations at the Vaquero Farms mitigation site. Observed all California red-legged frog life stages at the mitigation site. No California red-legged frogs have been observed at the project site during focused surveys. California tiger salamander larvae have been observed at the mitigation site.

Adobe Creek Upper Reach Restoration, Los Altos Hills, CA
Angie and the project team conducted tree surveys, biological and botanical assessments,

as well as prepared a biological resources report, impact analysis, and preliminary wetland jurisdictional determination for the approximate 1,100-linear foot Upper Reach of Adobe Creek in Los Altos and the Los Altos Hills, Santa Clara County, for the Santa Clara Valley Water District. The project team developed a Preservation Plan intended to improve the Adobe Creek ecosystem via the replacement of the concrete channel protection using minimal hardscape, sediment removal, and bank stabilization. The Adobe Creek Upper Reach 5 Restoration Project will address the severe erosion problems and narrow channel cross sections of this portion of the creek incorporating stakeholder selected preferred alternatives. As project manager and lead biologist, Angie oversaw the completion of biological studies, coordinated with District planners and biologists, analyzed potential impacts to biological resources for each alternative, and provided review and oversight of completion of the wetland delineation, tree report, and Biological Resources Report. Key issues include flood protection, creek channel improvement, channel bottom and bank erosion repair, and tree protection.

Santa Clara Valley Water District Stream Maintenance Program Biological Monitoring
As part of the permit conditions for routine stream maintenance, Angie conducted pre-construction surveys and monitoring during vegetation clearing, sediment removal, and tide gate replacement activities. Specific duties included contractor education, surveying for California clapper rail and salt marsh harvest mouse prior to and during clearing work , ensuring permit compliance, coordination with permitted District biologists, and stopping work as needed for protection of the species.

Burrowing Owl Habitat Assessment and Mapping, Santa Clara County, CA
AECOMconducted a habitat assessment, burrow mapping study, and standardized protocol surveys in multiple seasons for western burrowing owl (*Athene cunicularia hypugaea*), a California Species of Special Concern, along sections of approximately 45 miles of waterways in 18 watersheds managed by the Santa Clara Valley Water District (District). This study was designed to comply with the District’s Biodiversity Monitoring Plan, which is a Best Management Practice incorporated into the District’s Stream Maintenance Program (SMP). In the first phase of the project, we conducted a habitat assessment using GIS and field surveys. In the second phase, we documented and mapped burrow concentrations suitable for western burrowing owl occupation. The final phase included focused burring owl surveys conducted according to California Department of Fish and Game approved protocols. In her role as project manager, Angie participated in the development of the survey and mapping protocol in coordination with the District and our biology and GIS team. In addition, Angie participated in protocol surveys for phases two and three of the project.

Downtown Roseville Specific Plan and EIR, Roseville, CA
For the Downtown Roseville Specific Plan and Environmental Impact Report (EIR) in Roseville, Placer County, Angie and the team provided a host of biological consulting services focusing on the Dry Creek riparian corridor, including a review of environmental documentation, aerial photographs, and natural resource databases, a preliminary assessment of potential occurrence of special-status plant and wildlife species, an evaluation of the constraints and opportunities posed by existing on-site habitats, the preparation of a CEQA-ready technical report describing the biological resources found in the area, and an evaluation of the permitting implications. Angie led the project’s team analysis of biological constraints and restoration opportunities for Dry Creek which is being incorporated into the Specific Plan design. She has also drafted program-level mitigation and avoidance measures which address the goals of the Roseville General Plan, the Dry Creek Watershed Coordinated Resource Management

Plan, regulatory agencies, and local conservancy groups for incorporation into the EIR. She is continuing to participate in public outreach as part of the Specific Plan process.

Dutch Slough Community Park and Master Plan, Oakley, CA
Angie and her colleagues provided ecological planning services for the development of a Conceptual Master Plan for the Dutch Slough Community Park as well as public access to Dutch Slough in Oakley. They assisted 2M Associates with the conceptual design of formal educational and interpretive signage that enriches the public's experience and understanding of their environment, builds community, and enhances civic involvement. Angie and the planning team conducted an extensive opportunities and constraints analysis for selecting environmentally appropriate locations for future recreational uses, facilities, parking, boat access, and signage sites. Ms. Harbin-Ireland coordinated with the relevant agencies including the City of Oakley, U.S. Fish and Wildlife Service, U.S. Army Corps of Engineers, Regional Water Quality Control Board, NOAA Fisheries, and the California Department of Fish and Game, regarding the project design, anticipated impacts, CEQA and permitting requirements.

The Conceptual Master Plan balances public use and accessibility without negatively affecting the conservation of the diverse plant and wildlife communities that contribute to the long-term functioning of the San Francisco Bay Delta. Community workshops were facilitated to build consensus among the different stakeholders.

Lafayette Community Center Spanning Pedestrian Bridge and Bioengineering Project, Lafayette, CA
Angie worked with the City of Lafayette to obtain regulatory agency approval for the installation of a clear spanning pedestrian bridge across Las Trampas Creek to connect the Lafayette Community Center with a stretch of open space trail running along the Lafayette Community Park. With the assistance of the project team, Angie conducted a biological assessment and jurisdictional determination for the less than 0.1-acre project area, and prepared permit applications and revegetation plans for the bank stabilization of bridge installation sites. She successfully negotiated mitigation measures in coordination with the California Department of Fish and Game, Regional Water Quality Control Board, U.S. Army Corps of Engineers, and the U.S. Fish and Wildlife Service to avoid impacts to special-status species and compensate for habitat disturbance. Ms. Harbin-Ireland also conducted pre-construction surveys and contractor education for special-status species likely to occur on site, including California red-legged frog, western pond turtle, and foothill yellow-legged frog, to avoid potential impacts to these species during construction.

Aetna Springs Historical Resort, Napa County, CA
As project manager and lead biologist, Angie led the evaluation of potential biological constraints to development of the approximate 675-acre Aetna Springs property for Build, Inc. The project team's areas of focus included the historic resort core area and associated infrastructure, potential home sites, an existing golf course, Swartz Creek and Aetna Creek, as well as four on-line (i.e. built on a jurisdictional drainage) man-made lakes and drainages. Ms. Harbin-Ireland presented the project team's findings to the potential buyer/developer of the property. Angie prepared the constraints analysis that included an assessment of potential California red-legged frog habitat, which are known to occur upstream in Swartz Creek.

Golftec Development Group Project, Dublin Canyon, CA
Angie led the project team in the botanical survey for special-status plant species on a 325-acre Dublin Canyon study in Alameda County for T.W. Starkweather. Although 64 special-

status plant species were thought to occur on the site, the project team conducted a reconnaissance-level survey and focused rare plant surveys to determine that no federally or state-listed endangered or threatened species actually occurred on the site. They also conducted a wetland delineation and preliminary jurisdictional determination, completed a CEQA ready biological resources assessment report, and is currently conducting focused protocol-level surveys for California red-legged frog.

Front Street Repair and San Ramon Creek Bank Stabilization, Danville, CA
The Town of Danville received funding from the Federal Emergency Management Agency to repair two creek bank failures along San Ramon Creek in downtown Danville. AECOM biologists conducted USFWS-protocol level surveys for California red-legged frog, a wetland delineation, and biological resources assessment. Our restorationists also prepared a Revegetation and Monitoring Plan. A detailed permit application package was created and coordinated efforts to garner approvals from USACE, RWQCB, CDFG, FEMA, and USFWS. In addition to permit approvals an Initial Study/Mitigated Negative Declaration in compliance with CEQA was prepared and certified for the project. Angie participated in focused surveys for California red-legged frog and Western pond turtle. AECOM was a member of the ENGEO, Inc. team.

Kawar Biological Surveys, Contra Costa County, CA
Angie led the biological surveys for the 785-acre Kawar Project in Tassajara Valley for Andersen & Bonnifield. The project team completed a jurisdictional wetland delineation with mapping, biological assessment, and late spring season botanical survey. A protocol-level site assessment and focused surveys for California red-legged frog was completed. Protocol-level burrowing owl surveys, a San Joaquin kit fox Early Evaluation, and a tree survey is in progress. The project team participated in constraints based site planning and is also completing the biological resources portion of the project CEQA document. Angie conducted Early Evaluation and tracking study for San Joaquin kit fox. Further, she observed California red-legged frog adults and California tiger salamander larvae in aquatic features on site.

Prewett Ranch Habitat Evaluation, Brentwood, CA
Angie oversaw and coordinated the completion of on-site habitat evaluations of special-status plant and animal species, as well as determining the presence/absence of sensitive natural communities for a CEQA-ready technical report on Suncrest Homes’ 112-acre Prewett Ranch located southeast of the Lone Tree Way and O’Hara Drive intersection. She is supervising the on-going monitoring of a successful burrowing owl relocation effort and completion of pre-construction surveys for nesting birds, roosting bats, and western pond turtle. A certified arborist report and burrowing owl focused surveys were completed as part of the biological resources survey work. The reports have been utilized by CEQA planners to support the biological resources section of a Mitigated Negative Declaration.

Creekside Memorial Park Project, Contra Costa County, CA
For the Creekside Memorial Park Project, AECOM conducted all sensitvie biological resource studies according to accepted agency protocols including a wetland delineation, rare plant surveys, burrowing owl and nesting raptor surveys, focused amphibian surveys, and a San Joaquin kit fox Early Evaluation. Biologists also completed a habitat assessment for vernal pool fairy shrimp. Based on the findings of habitat assessments and surveys, we assisted the land planners and engineers with developing a constraints based site plan for Corrie Development Corporation that avoids and preserves the most sensitive resources on site.

As part of the CEQA review process, AECOM evaluated mitigation options for rare plant

populations present on site, providing input on the riparian planting and landscaping plans, and preparing the Biological Resources section of the draft EIR for the County’s use. We drafted a Biological Assessment in accordance with requirements of the U.S. Fish and Wildlife Service (USFWS) and has engaged the Service in informal consultation regarding project affects on listed species and acceptable mitigations through site tours and correspondence. As project manager and lead biologist, Angie conducted a U.S. Fish and Wildlife Service protocol-level site assessment and focused surveys for the California red-legged frog and an Early Evaluation for San Joaquin kit fox. Further, Angie observed California red-legged frog adults and California tiger salamander larvae in aquatic features on site.

Juliana Vineyards, Napa County, CA
In her role as project manager and lead biologist, Angie conducted a U.S. Fish and Wildlife Service protocol-level site assessment and focused surveys for the California red-legged frog for the 66.31-acre portion of the Juliana Vineyards property in Napa County. As part of the County's environmental review process, Angie assisted owners Riechers Spence with the evaluation of potential effects of a road and housing development on California red-legged frog habitat. She conducted a U.S. Fish and Wildlife Service protocol-level site assessment and focused surveys for the California red-legged frog. Reservoirs on site were heavily populated by bull frogs. She assisted owners with the evaluation of potential effects of a road and housing development on potential California red-legged frog habitat. Reservoirs on site were heavily populated by bull frogs that were observed during focused surveys.

Silverado Trail Biological and Permitting Services, Calistoga, CA
Angie, who served as project manager, and her colleagues provided biological, permitting, and mitigation monitoring services for the Curtis Helmer property on Silverado Trail. The project team conducted a formal wetland delineation and preliminary jurisdictional determination, reconnaissance-level site visit, focused botanical surveys, and pre-construction surveys for nesting birds and special-status bat species, and developed avoidance measures for western pond turtle. Upon completion of the surveys, the project team prepared California Environmental Quality Act (CEQA) ready technical reports summarizing the results and methods employed, as well as assisted with the City of Calistoga's preparation of the CEQA document. The Helmer property holds an abandoned wetland that was originally created by the City for treatment of re-used water. The pond subsequently became habitat for the western pond turtle. The project team analyzed the hydrologic regime of the on-site watershed in order to prepare the Mitigation and Monitoring Plan for the on-site drainage and to protect the created pond's hydrology.

Fisher Property Biological Assessment, Napa County, CA
As wildlife biologist, Angie conducted a biological assessment for the 1,200-acre Fisher Property in accordance with the requirements outlined in the Napa County Biology/Botany Resource Surveys and Reports for Riechers Spence. The Area of Potential Effect (APE) was delineated to determine the potential for the occurrence of special-status species. The assessment included the analysis of the Napa County Biological Sensitivity Maps maintained by the Napa County Conservation, Development, and Planning Department.

Metcalf Road Residential Development Permitting and Mitigation Planning, San Jose, CA
Angie led permitting and mitigation planning on a large San Jose residential development project for KB Home that included 213 residential units, open space, wetland enhancement, and habitat conservation areas. The Bay checkerspot butterfly, California tiger salamander, California red-legged frog,

western burrowing owl, and other special-status species inhabit this 260-acre site. The project team conducted focused surveys, mapped plant and animal populations, prepared a Mitigation and Monitoring Plan, designed mitigation features including wetland habitat and other wildlife enhancement features, and oversaw the construction of mitigation areas and the translocation of California tiger salamanders, western burrowing owls, and California red-legged frogs to the mitigation area as needed. The project team negotiated with U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, Regional Water Quality Control Board, California Department of Fish and Game, and the City of San Jose to ensure in-perpetuity conservation of 200 acres of open space, including habitat for several special-status species. Angie and her colleagues worked with the City and the Regional Water Quality Control Board to plan Best Management Practices to fully address water quality concerns. Other issues included serpentine soils preservation, wetland mitigation, habitat interfaces, and wildlife corridor movement. Angie conducted and lead habitat assessments and pre-construction surveys for the California tiger salamander, California red-legged frog, western burrowing owl, and other special-status species.

Cypress Grove Biological Resource Assessment and Permitting, Oakley, CA
For D.R. Horton’s Cypress Grove Residential Development, Angie and her colleagues conducted a formal wetland delineation, impact analysis, mitigation scoping, biological assessment, Essential Fish Habitat assessment, special-status plant surveys, and focused wildlife surveys for special-status species such as the western burrowing owl, silvery legless lizard, giant garter snake, Swainson’s hawk, and Valley elderberry longhorn beetle. Angie completed an analysis of foraging habitats available to nesting Swainson’s hawk in the region which has been utilized by the City to determine the significance level of development project impacts to Swainson’s hawk foraging habitat in the Oakley area. The project team secured permits from the U.S. Fish and Wildlife Service, U.S. Army Corps of Engineers, California Department of Fish and Game, NOAA Fisheries, and the Contra Costa Water Department to reduce and/or mitigate impacts to special-status species. The AECOM team prepared the draft California Environmental Quality Act text, which was directly incorporated into the City’s Environmental Impact Report. Ms. Harbin-Ireland and her colleagues conducted all pre-construction surveys for sensitive species and environmental compliance monitoring during construction in accordance with project permits. Prior to construction passive relocation of burrowing owls was completed and on-going monitoring required. A white-tailed kite nest and swallow nests were found on site which required protection and monitoring during construction. Ms. Harbin-Ireland was responsible for oversight of avian protection measures.

California Tiger Salamander Surveys, Gilroy, CA
For the 23-acre study area located in an orchard and open grassland habitats, AECOM biologists conducted extensive surveys for California tiger salamander. Several hundred burrows were viewed using a fiber optic scope to assess the presence or absence of adults and/or juveniles. The biology team determined through an exhaustive scoping and excavation effort that juveniles were utilizing the site as upland aestivation habitat. The presence of an AECOM biologist with a USFWS recovery permit was required for the surveys. Angie filled this role and provided technical oversight to the project for Llagas Creek Investors.

Sunnyvale East and West Channels Baseline Biological Report, Sunnyvale, CA
AECOM conducted a reconnaissance-level evaluation of the proposed Sunnyvale East and West channel flood protection project for the Santa Clara Valley Water District. The study area included the channelized waterways as well as Pond A4 in the South San Francisco

Bay. The AECOM biology team mapped vegetation communities including salt marsh and brackish marsh and delineated aquatic and terrestrial habitats. An evaluation of the suitability of the study area to support special-status species such as California clapper rail, salt marsh harvest mouse, western snowy plover, and burrowing owl, among others, was completed. Recommendations for further biological studies to identify site constraints and inform project plans were provided to the District. Angie provided technical oversight and senior review to the biology team.

Lower Guadalupe Pre-Construction Surveys and Monitoring, San Jose, CA
Prior to construction of capital improvements on the Guadalupe River between the San Jose International airport and downtown San Jose, Angie coordinated with the Santa Clara Valley Water District, engineers, and contractors regarding permit conditions and protection requirements for biological resources. She led the pre-construction surveys completed by the biology team and follow-up monitoring of active bird nests. Angie provided guidance to the project construction team regarding adequate protections, agency coordination, and creative solutions to allow construction to move forward where feasible.

Westshore Marina, Point Richmond, CA
At the request of Toll Brothers, Angie conducted a reconnaissance-level biological assessment and jurisdictional delineation for the approximate 6-acre Westshore Marina property. The project site is located at the terminus of Marina Way on the Richmond Inner Harbor Channel. An evaluation of potential project impacts was included in the report as well as suggested minimization measures. The biological report was utilized in support of the City’s environmental review process. Angie served as project manager.

General Mills Due Diligence, Vallejo, CA
Angie was the project manager for the evaluation of the potential biological constraints to development of the 38-acre General Mills property located on Mare Island Strait for Brooks Street. The subject property is the former site of the General Mills Plant. She evaluated the potential for occurrence of special-status species and identified sensitive habitats on site. An outline of the necessary biological studies needed for the CEQA and regulatory agency permitting process was developed as well as a preliminary analysis of site constraints, potential impacts associated with various site plan alternatives, and a possible permitting strategy. Biological site constraints included wetlands and potential monarch and Callipe Silverspot butterfly habitat.

Aptos Transmission Line Relocation, Santa Cruz County, CA
The Santa Cruz Sanitation District proposes to install an approximate 3-mile sewer transmission line and facilities to replace failing facilities in the County of Santa Cruz. The project, represented by Harris & Associates, is located within the Coastal Zone and is within the jurisdiction of California State Parks, the City of Capitola, the unincorporated Town of Aptos, and Santa Cruz County. AECOM prepared a wetland delineation, biological resources assessment, and frac-out contingency plan for approval by regulatory agencies to allow jack-and-boring underneath Aptos Creek. As lead biologist, Angie oversaw the biological studies, impact analyses, and development of adequate mitigation measures to protect sensitive biological resources near the project area including steelhead and tidewater goby. We also prepared an IS/MND pursuant to CEQA and a comprehensive permit application package to USACE, RWQCB, CDFG, USFWS, and NMFS.

Soquel Creek Lagoon Biofiltration Wetland Project, Capitola, CA
Working with Harris & Associates, AECOM provided biological and permitting consultation for the City of Capitola's proposed biofiltration project on Soquel Creek. The City of Capitola provides a swimming lagoon in Soquel Creek by berming the mouth of Soquel Creek for residents and

visitors every year beginning Memorial Day to be maintained for the rest of the summer. However, the manmade lagoon has been riddled with a host of water quality concerns mostly as a result of gulls and has experienced regular beach closures. We worked with the project engineers, the City of Capitola, and the regulatory agencies to develop and construct a biofiltration wetland to improve water quality. Soquel Creek and the lagoon provide habitat for steelhead and historically for tidewater goby. While improved water quality will benefit listed species as well as people using the lagoon for swimming, species' concerns were addressed through careful design and planning considerations to allow this biofiltration unit to be permitted and constructed by the regulatory agencies. As lead biologist, Angie coordinated the biological team and provided senior review and oversight of all technical reporting and construction monitoring.

Proposed Department of Veterans Affairs Facilities at Alameda Point, Alameda, CA
AECOM was contracted by the U.S. Department of Veterans Affairs to conduct a Biological Resources Report, formal wetland delineation, botanical surveys, and Biological Assessment for the approximate 579-acre parcel, located at the former Naval Air Station (NAS), Alameda Point, Alameda, California. The site is situated on a peninsula within San Francisco Bay. Ms. Harbin-Ireland and her team conducted back ground literature reviews and field surveys to delineate the extent of sensitive resources to inform the proposed project design and prepare environmental review documentation. EDAW is working with the client and the USFWS to ensure protection of a federally listed bird that nests on site, the California least tern. Other sensitive resources being evaluated include aquatic habitats, rare plants, waterbirds, shorebirds, marine mammals, and fisheries. Angie, in her role as lead biologist, oversaw the field surveys, reporting of results, and development of conservation measures for federally listed species.

White Property Residential Development, Fort Bragg, CA
As lead wildlife biologist, Angie conducted a biological resources assessment and assisted with the routine wetland delineation for the 69-acre White Property for Sean Hogan, Esq. The complex delineation and habitat assessment included the identification of waters of the U.S. and state, as well as a determination of mean high tide for an off-site outfall feature which connect to the Pacific Ocean. Angie was able to evaluate the entire site and determine habitat areas of high value. This information was then used to alter the site plan and reduce impacts to areas determined to be sensitive. Angie’s experience with the fauna of the region was essential to the habitat assessment, and supported the project team’s efforts to reduce the overall impact to sensitive biological resources.

Benicia Waterfront Village, Benicia, CA
Benicia Waterfront Village, proposed by Focus Realty Services, required extensive shoreline revetment along the Carquinez Strait. The existing shoreline was in disrepair and was considered unsafe for public access. Angie, who served as lead biologist, and her team secured regulatory permit approvals for the development project and 435 linear feet of shoreline revetment from the U.S. Army Corps of Engineers, Regional Water Quality Control Board, NOAA Fisheries and San Francisco Bay Area Development Commission in less than one year. We worked closely with the project engineers in developing a project approach to avoid impacts to ESA-listed fisheries and Essential Fish Habitat. Our team also conducted habitat and fishery assessments, focused surveys for western burrowing owl, pre-construction surveys, and botanical surveys.

Marina Vista Streetscape Project, Martinez, CA
For the proposed Marina Vista Streetscape Project in Martinez, Contra Costa County, Ms. Harbin-Ireland and her colleagues assisted the City with the environmental review process to

secure NEPA compliance through CalTrans. The environmental review and project approval was completed under a very short timeline with all studies including a Natural Environment Study, Archeological Survey Report, and a Historic Property Survey Report completed, reviewed by the agencies, and approved within three months. The successful completion of the NEPA documentation and approval within this timeframe greatly contributed to securing federal funding for the roadway improvement project. Ms. Harbin-Ireland and her team members worked with the engineering and design team throughout the project planning phase to streamline compliance through avoidance of sensitive biological and cultural resources in the vicinity. Ms. Harbin-Ireland served as the Project Manager for the biological and cultural resources evaluations and took the lead in coordinating with other project team members, the City, and CalTrans staff to meet the critical path schedule.

Oak Park Residential Development Due Diligence, Pleasant Hill, CA
Summerhill Homes contemplated reuse of an abandoned elementary school site to construct a 76-unit in-fill residential development in Pleasant Hill, Contra Costa County, California. Ms. Harbin-Ireland conducted an initial site visit and performed a due diligence level constraints analyses to evaluate feasibility of development of the property. During additional phases of site review and preparation of development applications, EDAW conducted a wetland delineation, biological resources assessment, and commenced applications for 401 Water Quality Control Board Certification and a California Department of Fish and Game Section 1600 Streambed Alteration Agreement for the approximate 10-acre project site.

Westshore Marina, Point Richmond
At the request of Toll Brothers, Ms. Harbin-Ireland conducted a reconnaissance-level biological assessment and jurisdictional delineation for the approximate 6-acre Westshore Marina property located within the City of Richmond, in western Contra Costa County, California. The project site is located at the terminus of Marina Way on the Richmond Inner Harbor Channel. An evaluation of potential project impacts was included in the report as well as suggested minimization measures. The biological report was utilized in support of the City’s environmental review process.

East Cypress Corridor Specific Plan and EIR, Oakley
For the 2,500-acre City of Oakley Specific Plan and Environmental Impact Report (EIR) in Oakley, Contra Costa County, Ms. Harbin-Ireland oversaw the completion of a host of biological consulting services, including a review of environmental documentation, aerial photographs, and natural resource databases, a preliminary assessment of potential occurrence of special-status plant and wildlife species, all necessary focused follow-up surveys, an evaluation of the constraints and opportunities posed by existing on-site habitats, the preparation of CEQA-ready technical reports describing the biological resources found in the area, and an evaluation of the permitting implications.

Ms. Harbin-Ireland participated in the constraints-based planning process and provided the biological resources section of the Specific Plan and the EIR. She worked collaboratively with the City and plan participants, including the developer group, to identify constraints, address them in Specific Plan and EIR, and present findings and preservation strategies at public meetings. Mitigation measures to reduce potential impacts to biological resources were drafted for both project and program-level components of the Specific Plan EIR. Multi-disciplinary issues in the Specific Plan EIR process included transportation, infrastructure, utility lines, cultural resources, levees, and the Delta habitats. Because the project team is working for both the City and the landowners, we have coordinated much of the land use planning

solutions to ensure CEQA compliance at a project level for those properties with sufficient information. This project includes extensive work within the San Joaquin Delta and requires counsel and coordination with NOAA Fisheries and the U.S. Fish and Wildlife Service.

City of Martinez, East Bay Regional Park District, and Caltrans Marsh Enhancement and Flood Management, Martinez
Working over a seven year period, EDAW assisted the project design team, including Korve Engineering and Phillip Williams and Associates, to support the City of Martinez, the East Bay Regional Park District, and the California Department of Transportation (Caltrans) from design to inception of a joint venture to complete an 11-acre marsh enhancement and flood management project at the Martinez Regional Shoreline Park in the City of Martinez, Contra Costa County. The project provided mitigation credit for impacts related to a number of Caltrans projects. We assisted in defining goals for the mitigation site and the development of three design alternatives that integrated flood control, trails, delta smelt habitat creation, and marsh enhancement goals with the opportunities and constraints of the site. After selection of the preferred alternative, we developed a conceptual design of the selected alternative that included a preliminary grading approach, sensitive construction practices, revegetation plant palettes, exotics eradication, protection of special-status species, and measures to minimize impacts to adjacent habitats. The project team worked with Phillip Williams and Associates to develop a Mitigation Monitoring Plan for the entire site. Ms. Harbin-Ireland has assisted in carrying out the monitoring program for the successful mitigation site.

Orwood Marina and Residential Development, Contra Costa County
A private developer proposed to construct residential units and a marina on an approximate 40-acre site located on the southwest corner of Orwood Tract in the Delta region of eastern Contra Costa County, California. The project is immediately adjacent to a delta slough and would involve breaching an agricultural levee and would involve potential impacts to Section 10 waters, wetlands, and special-status species. Ms. Harbin-Ireland conducted a due diligence and biological constraints analysis of the below sea level site to determine potentially sensitive resources to avoid and to identify regulatory permitting requirements for unavoidable impacts.

Golden Gate Bridge Suicide Barrier Project, San Francisco. California
For the proposed suicide barrier on the Golden Gate Bridge, Ms. Harbin-Ireland and her colleagues are assisting the District with evaluating potential impacts to avian species. Systematic observations of avian behavior around the bridge structure were conducted to evaluate the potential risks posed by adding a suicide barrier below the roadway. The primary species evaluated include gulls, cormorants, pelicans, peregrine falcon, and red-tailed hawks. A report of survey results and recommendations to reduce potential hazards to migrating birds was produced.

Lavenida Biological Resources Assessment, Orinda, California
For the Lavenida residential development proposed in Orinda Contra Costa County, EDAW Inc. conducted a biological resource study including a wetland delineation. EDAW is assisting the land planners and engineers with developing a constraints based site plan that avoids and preserves the most sensitive resources on site. As part of the CEQA review process, EDAW is providing input on the riparian planting and landscaping plans, and preparing the Biological Resources section of the Initial Study for the City’s use.

Alternative Intake Project, San Joaquin County, CA

EDAW conducted extensive biological surveys and provided permitting compliance services for the Alternative Intake Project on Victoria Island in San Joaquin County, California. The project required surveys and an ongoing passive relocation effort for burrowing owl, as well as protocol-level focused surveys for Swainson's hawk. In addition, EDAW conducted pre-construction surveys for nesting birds, giant garter snake, and western pond turtle, as well as construction monitoring during project implementation. Ms. Harbin-Ireland has served as the senior biologist and permitting specialist for environmental compliance services for the Alternative Intake Project on Victoria Island in San Joaquin County, California. In several cases she has been able to negotiate with agency staff and construction has been able to continue within standard non-disturbance buffer zones due to short duration and low impact work. She has also negotiated extended construction windows from the U.S. Fish and Wildlife Service with implementation of additional avoidance measures.

Ygnacio Valley Road Permanent Restoration, Concord, CA
The City of Concord received federal disaster relief funding to repair a landslide located within the Lime Ridge Open Space and designated Alameda whipsnake Critical Habitat. EDAW biologists conducted a biological resources assessment, wetland assessment, and focused botanical surveys. EDAW oversaw the obligations to comply with NEPA, the federal Department of Transportation Act, CEQA, and the Endangered Species Act. A Section 4(f) Programmatic Report and Natural Environment Study (NES) were also prepared to Caltrans requirements. The EDAW team served as environmental monitors for Phase 1 of the project in 2008 and is currently providing environmental compliance oversight for Phase 2 in 2009. Our biologists were approved by the U.S. Fish and Wildlife Service to conduct pre-construction surveys and contractor education sessions for Alameda whipsnake, California tiger salamander, and California red-legged frog as outlined in the Biological Opinion. Pre-construction surveys for burrowing owl and other nesting birds were also completed prior to groundbreaking. We are carrying out on-going construction monitoring, coordination, and reporting as required by conservation measures for these species. EDAW has successfully coordinated with City planners, engineers, and inspectors as well as construction contractors to convey and interpret environmental avoidance and minimization measures required for the project and are actively involved in their review and implementation in the field. Ms. Harbin-Ireland is overseeing pre-construction surveys, construction monitoring, overall environmental compliance, and contractor education during the Phase 2 of the project.

Grizzly Island Road Bridge Project, Solano County, California
Solano County is replacing a vehicular bridge on Grizzly Island Road over Hill Slough in Suisun Bay, with potential impacts to ecologically sensitive tidal marsh habitat. AECOM performed biological services associated with permit compliance, including rare plant surveys, surveys for California clapper rail, California black rail, salt marsh harvest mouse, and western pond turtle, and construction monitoring for Delta smelt during in-water pile-driving. AECOM made recommendations to the County to comply with resource agency permits for these species and provided technical reports of survey findings. Angie provided senior oversight during biological compliance monitoring.

Rock Slough Intake Fish Screen Project, Contra Costa County
AECOM conducted extensive biological surveys and provided permitting compliance services for the Rock Slough Intake Fish Screen project near Oakley, CA. Angie worked with the District to obtain the required project permits from USACE, NMFS, USFWS, RWQCB and CDFG in a four month time period. The project required a wetlands jurisdictional determination, protocol-level focused surveys

for rare plants, burrowing owl, California red-legged frog, western pond turtle, and giant garter snake prior to construction.

Angie led pre-construction surveys for rare plants, burrowing owl, giant garter snake, San Joaquin kit fox, California red-legged frog, and western pond turtle. She managed implementation of avoidance measures for species found on site including rare plants, burrowing owl, and western pond tutle. She is the main point of contact for construction managers and is overseeing implementation of all other biological mitigation measures including construction monitoring and development and implementation of the Suisun Marsh aster mitigation and monitoring plan.

Alice L. Harron

SUMMARY OF QUALIFICATIONS

Experienced leader of complex power generation project acquisitions, commercial power purchase agreements and other contract negotiations. Over 15 years of experience in the power generation and project finance industry from both the independent power producer and utility perspectives.

PROFESSIONAL EXPERIENCE

Senior Director, Development, Solar Millennium, LLC, Berkeley, CA 2009

- Oversee development of Solar Millennium's three solar thermal projects in California
  - Lead and oversee all aspects of project development including permitting and regulatory approval, land acquisition, and community outreach.
  - Coordinate and oversee project managers, outside consultants, and internal support staff as part of the development process.

***Principal*, Renewable Development, Pacific Gas and Electric, San Francisco, CA 2003-2009**

- Led negotiations to acquire a partially, constructed gas-fired combined cycle 600 MW power plant (Gateway) from Mirant during and after its bankruptcy.
  Result: *Acquired plant assets as part of bankruptcy settlement resulting in first, utility-built, power plant in decades.*
- Led team to accelerate acquisition of 650 MW gas-fired combined cycle power plant (Colusa) after counterparty notified PG&E that it planned to terminate its agreement.
  Result: *Executed amended agreement and acquired development assets quickly to minimize delay in forecasted on-line date of power plant.*
- Negotiated bilateral power purchase agreement for 150 MW of wind generation including price, credit, and other provisions particular to a renewable resource such as scheduling, delivery, CEC certification process, and green attributes.
  Result: *Achieved near-term renewable generation in CA.*
- Leading development of utility wind and solar thermal generation projects.
  Result: *Screening wind development opportunities and developing a solar thermal project.*
- Led cross-functional team investigating commercial and political viability of obtaining renewable generation sources in British Columbia.
  Result: *Pursued discussions about potential commercial arrangements.*

***Director, Strategic Assessment,* Calpine Corporation, San Jose, CA 2001-2003**

- Analyzed credit agreements ($3.5 billion of credit facilities (Calpine Construction Finance Company (CCFC) I and CCFC II)) to optimize cash management of portfolio.
- Developed detailed financial spreadsheet models to support refinancing.

***Manager, Marketing and Financial Analysis,* PG&E National Energy Group, 1993-2001**

- Provided a comprehensive market assessment of current assets, power plant development, acquisitions and marketing opportunities and presented to senior management.
- Developed sophisticated financial spreadsheet models to support financing of independent power projects, including refinancing, project work-outs, securing letters of credit, acquiring additional debt, acquisitions and converting projects from construction to term loans.
- Reviewed key project contracts and annual power plant budgets to assess economic, financial, and technical risks.
- Communicated with senior managers, partners, and lenders about project economics.

EDUCATION

MBA, Finance, University of Maryland
BA, Economics, University of Maryland

Stacey Jordan, PhD, RPA
Senior Archaeologist

Education
PhD, Anthropology, Rutgers University, New Brunswick, NJ,2000
MPhil, Anthropology, Rutgers University, New Brunswick, NJ, 1995
MA, Anthropology, Rutgers University, New Brunswick, NJ, 1994
BA with High Distinction, Anthropology, University of California, Berkeley, 1991

Professional Affiliations
Member, Society for American Archaeology
Member, Register of Professional Archaeologists

Certifications + Approvals
County of San Diego Approved Consultant List for Archaeological Resources
County of San Diego Approved Consultant List for Historic Resources
County of Riverside Approved Cultural Resources Consultant (No. 222)

Awards
2009 - San Diego Archaeological Center Excellence in Archaeology Award, Excellence in Cultural Heritage, Archaeological Data Recovery at CA-SDI-10,920 and Site Stabilization at Sites CA-SDI-586 and CA-SDI-10,920 Along the Southern Shore of Lake Hodges
2008 - San Diego AEP Outstanding Environmental Resource Document Finalist, Boulder Oaks Open Space Preserve (winner Honorable Mention at September 25 AEP Awards)
2008 - Riverside County Planning Department, Certificate of Appreciation for the Cultural Resources Working Group
2006 - City of San Diego Historical Resources Board Award of Excellence, CCDC Downtown San Diego African-American Heritage Study
2005 - California Preservation Foundation Preservation Design Award, CCDC Downtown San Diego African-American Heritage Study
2005 - AEP Outstanding Public Involvement/Education Program, CCDC Downtown San Diego African-American Heritage Study
2005 - APA, San Diego Section Focused Issue Planning Award Honorable Mention, CCDC Downtown San Diego African-American Heritage Study

Grants + Fellowships
2003, Wenner-Gren Foundation for Anthropological Research Individual Research Grant Team Member: "Analysis and Interpretation of Archaeological Residues from Excavations at the Castle of Good Hope, Cape, South Africa'"
1996-1997, Wenner-Gren Foundation for Anthropological Research, Predoctoral Research Grant #6021
1994-1995, Wenner-Gren Foundation for Anthropological Research, Predoctoral Research Grant #5739
1992-1996, Rutgers University Excellence Fellowship

Publications
Jordan, Stacey. 2002. Classification and Typologies. In: *Encyclopedia of Historical Archaeology*, Charles E. Orser, Jr. (ed.). Routledge. London.
Jordan, Stacey and Carmel Schrire. 2002. Material Culture and the Roots of Colonial Society at the South African Cape of Good Hope. In: *The Archaeology of Colonialism*, Claire Lyons and John Papadopoulos (eds.). Getty Research Institute. Los Angeles. Jordan, Stacey C. 2000. Coarse Earthenware at the Dutch Colonial Cape of Good Hope, South Africa: A history of local production and typology of products. *International Journal of Historical Archaeology*, Vol. 4, No. 2.
Jordan, Stacey, Duncan Miller and Carmel Schrire. 1999. Petrographic Characterization of Locally Produced Pottery from the Dutch Colonial Cape of Good Hope, South Africa. *Journal of Archaeological Science*, Vol. 26.
Jordan, Stacey. 1994. Colonial Coarse Earthenware at the South African Cape of Good Hope, 1669-c.1900. *Crosscurrents*, Vol. VI.

Dr. Stacey Jordan has been professionally involved in the fields of archaeology and history for over a decade. Her specialty in historical archaeology combines the use of material culture and the archival record in anthropologically driven analyses of cultural resources. Dr. Jordan was the recipient of the Excellence Fellowship at Rutgers University, as well as multiple research grants from the Wenner-Gren Foundation for Anthropological Research. She is the author of various publications as well as numerous papers that have been presented at national and international conferences. Dr. Jordan is particularly well versed in the analysis of historical ceramics and has taught courses in the method and theory of historical archaeology as well as in the identification and analysis of historical ceramics and glass. She has extensive experience in archival research and historical writing, and has worked on projects spanning from early colonial contact to the recent past. In addition, Dr. Jordan has served on a variety of prehistoric and historic excavations both in the United States and abroad. Supplementing her work in cultural resources management, she conducts research on ceramics, community development, and identity construction in colonial South Africa.

Project Experience

County of San Diego Department of Parks and Recreation Sage Hill Preserve Cultural Surveys, San Diego County, CA
Cultural resources task manager for Phase I pedestrian survey and cultural resource inventories of the Sage Hill Preserve in unincorporated northern San Diego County. This project involved the identification and documentation of prehistoric and historic resources, built environment features, and existing infrastructure to assist the Department of Parks and Recreation in resource management through development of a Resource Management Plan including Area Specific Management Directives. Extensive archival and background research, including a contact program with local historic societies, was conducted to develop a historical context for the property. Methods and results of the intensive pedestrian survey were reported in a County of San Diego format technical report which included extensive cultural histories, a descriptive inventory of identified sites, and management guidelines for potentially significant cultural resources. All resources were documented on DPR 523 forms, and field work was conducted in coordination with a Native American monitor.

Solar Millennium Ridgecrest Solar Power Project, Ridgecrest, CA
Project Manager of ongoing BLM Class III intensive pedestrian survey, resource documentation, and site evaluation efforts for an approximately 2000-acre solar power project on BLM land in the western Mojave Desert under a Fast-Track ARRA funding schedule. This project includes extensive records searches and data management, multi-agency coordination and consultation involving BLM and the California Energy Commission, an ongoing Native American contact and outreach program.

San Diego Gas & Electric On-Call Cultural Services, San Diego and Imperial Counties, CA
Director of on-call inventory, survey, monitoring and reporting work as part of SDGEs infrastructure operations and maintenance activities on both private and public lands. Tasks include records searches, construction monitoring, archaeological survey and documentation, completion of State of California DPR forms, and management recommendations.

Southern California Edison As-Needed Archaeological Services, CA
Director of on-call survey, resource identification, documentation, testing, and evaluation efforts related to Southern California Edison infrastructure replacements and development throughout the state on both private and public lands, including BLM, USACE, and USFS. Product involves completion of State of California DPR forms, assessment of resource significance according to NRHP eligibility and CEQA significance criteria, and management recommendations. Work done before joining this firm.

San Nicolas Island Archaeological Evaluations, Ventura County, CA
Project Manager for ongoing archaeological evaluation of prehistoric sites CA-SNI-316, 361 and 550 on San Nicolas Island in the Channel Islands of the Calfornia Bight. This project involves the significance testing and analysis of Middle and Late Holocene sites and synthesis of results with existing island-wide archaeological data.

Emergency Storage Project Cultural Resources, Lake Hodges, San Diego County, CA
Senior Archaeologist and report co-author for data recovery project at site CA-SDI-10,920 along Lake Hodges. The project involves integration of regional data to provide context for the analysis of CA-SDI-10,920 and examination of the Late Prehistoric occupation of the San Dieguito River Valley around present-day Lake Hodges.

Jefferson National Expansion Memorial Environmental Impact Study, St. Louis, MO
Co-author for prehistoric and historical archaeology background and impact analysis sections related to the proposed expansion of the Jefferson National Expansion Memorial (Gateway Arch) in St. Louis, Missouri and East St. Louis, Illinois.

Old Town State Historic Park Jolly Boy Project, San Diego, CA
Contributor to the archaeological data recovery report for the Jolly Boy Saloon site in Old Town San Diego State Historic Park. Contributions to this project involve the synthesis of existing data on Old Town San Diego and development of an archaeological and historic context for the analysis and interpretation of recovered material.

Ocotillo Wells SVRA General Plan & Environmental Impact Report Cultural Resources, Imperial County, CA
Ongoing Cultural Resources analyses of Ocotillo Wells State Vehicular Recreation Area. This project involves the analysis of existing cultural resources conditions, and recommendations for the treatment of cultural resources.

Banning State Water Transmission Line, Riverside County, CA
Task Manager for cultural resources sensitivity analysis for the construction of an approximately 2.4-mile long pipeline within the rights-of-way of paved streets within the unincorporated area of the county. As part of this analysis a records search of the Eastern Information Center was conducted to identify cultural resources studies and identified resources within a one-mile radius of the Banning State Water Transmission Line's proposed alignment. A sacred lands file search was also requested from the Native American Heritage Commission.

Heber Dunes SVRA General Plan & Environmental Impact Report Cultural Resources, Imperial County, CA
Ongoing Cultural Resources Phase I Survey and Inventory of Heber Dunes State Vehicular Recreation Area. This project involves the analysis of existing cultural resources conditions, assessment of proposed facilities maintenance and development impacts, and recommendations for the treatment of cultural resources.

SWPL 500kV Line Wetland Delineation , San Diego County, CA
Project Director for Phase I pedestrian surveys, resource documentation, Section 106 resource evaluation, findings of effect and management recommendations in support of USACE wetland permitting associated with proposed jurisdictional water crossing improvement projects in southern San Diego County. Work done before joining this firm.

Boulder Oaks, Sycamore/Goodan, El Capitan/Oakoasis/ El Monte/Steltzer Open Space Preserve and Regional Park Cultural Resources Inventories, San Diego County, CA
Project director for Phase I pedestrian survey and cultural resource inventories of Open Space Preserves and Regional Parks in unincorporated central San Diego County. The projects involved the identification and documentation of prehistoric and historic resources, built environment features, and existing infrastructure to assist the Department of Parks and Recreation in resource management. Inventory reports included extensive archival research and historical narrative, an inventory of identified sites, and management guidelines for potentially significant cultural resources developed in consultation with Native Americans where appropriate. Work done before joining this firm.

State Route 94 Operational Improvements Inventory and Evaluation, San Diego County, CA
Director of cultural resources efforts and Caltrans coordination for survey, documentation, and evaluation related to proposed operational improvements along an 18-mile stretch of State Route 94 in San Diego County. Development of Caltrans-format documentation for archaeological and built environment resources. Work done before joining this firm.

BLM Santa Rosa San Jacinto Mountains National Monument Trails Inventory, Riverside County, CA
As Project Director, directed cultural resources inventory of trail systems within the Santa Rosa San Jacinto Mountains National Monument, including documentation of prehistoric and historic routes and associated resources within trail corridors. Completed cultural resources inventory report for BLM, including BLM-format GIS database. Work was performed before joining this firm.

High Winds Wind Farm Project, Solano County, CA
Conducted archival and historical research on the settlement and development of southern Solano County. Evaluated nine historic resources and surrounding landscape significance according to CEQA criteria. Completed historical background and assessment report, photographically documented resources and landscape, and updated State DPR forms for previously identified resources. Work done before joining this firm.

U.S. Fish & Wildlife Service Hercules Gunpowder Point Historical Resources Evaluation, Chula Vista, CA
Project director for the historical evaluation of the Hercules Powder Company Gunpowder Point facility in Chula Vista. Supervised archival and historical research, directed field survey and documentation efforts, and provided National Register eligibility evaluation for the site. Work was performed before joining this firm.

CCDC Downtown San Diego African-American Heritage Study, San Diego, CA
As Senior Historian, documented the development and growth of the African-American community in downtown San

Diego through the 19th and 20th centuries. Archival information, oral histories, architectural evaluations, and recognition of potential archaeological sites were used to document the African-American community's economic, social, and political history in the downtown area, and to identify an African-American Thematic Historic District. Work was performed before joining this firm.

Mannasse's Corral/Presidio Hills Golf Course, San Diego, CA
Directed and managed archaeological excavation and interpretation of historic refuse and features related to Old Town San Diego located within the city-owned Presidio Hills Golf Course property. Conducted analysis of excavated material, researched and interpreted site history and use, and assessed resource significance, broadening the understanding of Old Town's archaeological signature and historic lifeways. Work was performed before joining this firm.

California State Parks Old Town San Diego State Historic Park Archaeological Excavations, San Diego, CA
Managed excavation and analysis of 19th-century deposits recovered from two locations within Old Town State Historic Park, representing roadbed flood wash and tavern refuse, respectively. Oversaw ceramic and glass cataloguing, and conducted historical research and interpretation on specific site uses and depositional processes. Prepared State of California DPR forms, and assessed resource significance according to NRHP eligibility criteria. Work was performed before joining this firm.

City of El Centro Cole Road and Dogwood Road Widening Projects, Imperial County, CA
Project management of field survey and documentation efforts related to the widening of Dogwood Road and Cole Road in unincorporated Imperial County. Produced CEQA and Caltrans-format documentation related to identified resources and proposed project impacts. Work was performed before joining this firm.

Blackwater West Cultural Resources Phase I and Phase II Studies, Potrero, CA
Project director overseeing the survey of an approximately 850-acre area in eastern San Diego County and test excavation of identified prehistoric sites. Directed archaeological and built environment documentation, Extended Phase I testing, and Phase II testing efforts under the new County of San Diego Guidelines implemented September 2006. Work was performed before joining this firm.

Vine/Carter Hotel Historical Assessment, San Diego, CA
As Project Manager, conducted extensive archival research and historical assessment of the African-American-owned Vine/Carter Hotel building in San Diego's East Village. Conducted historical research on the building's ownership history and development; its historical uses, managers, and residents; and its place in San Diego's historical African-American community. Photographed and documented the building according to Office of Historic Preservation guidelines, prepared State of California DPR forms, and assessed the building's significance according to local, state, and federal significance criteria. As a result of the project, the Vine/Carter Hotel was nominated as a significant historical resource by the City of San Diego Historical Resources Board. Work was performed before joining this firm.

Mission San Gabriel Gardens Excavation, Jump Start Project, San Gabriel, CA
As Project Manager, conducted monitoring and excavation of Spanish colonial and American-era deposits associated with the construction of the original Mission San Gabriel and later 19th-century occupations. Documented the sites according to State Office of Historic Preservation guidelines, and assessed the resources according to NRHP and CEQA significance criteria. Work was performed before joining this firm.

Lillian Grant Property Public Art Project, San Diego, CA
As Project Manager, provided historical research services and written text incorporated into the public art commissioned for the redevelopment of the historical Lillian Grant Property in the East Village of San Diego. The public art, located at 14th and J streets at the Lillian Place affordable housing complex, commemorates the histories, experiences, and contributions of African-Americans to the development of San Diego and the East Village area in particular. Work was performed before joining this firm.

Lillian Grant Property Historic American Building Survey (HABS), San Diego, CA
As Project Manager, supervised HABS of the Lillian Grant properties in the East Village community of San Diego, submitted to the City of San Diego. Oversaw archival quality photographic documentation, and architectural line and plan drawings, as well as completed required HABS historical

narrative on the subject buildings. Work was performed before joining this firm.

San Gabriel Mission Trench Excavation, San Gabriel, CA
As Senior Archaeologist, conducted historical and archival research on the prehistory and history of the San Gabriel Mission and surrounding areas to assess potential impacts of proposed below-grade railway trench. Compiled historical narrative, identified potential subsurface features, and recommended appropriate mitigation strategies. Work was performed before joining this firm.

LA Department of Parks and Recreation Camp Seely National Register Evaluation, San Bernardino National Forest, San Bernardino County, CA
As Senior Historian, conducted NRHP evaluation of the early-20th-century Camp Seely recreational camp facility leased by the City of Los Angeles in the San Bernardino National Forest. Conducted historical and archival research on the Camp's history and development; its individual buildings; and its architects, including Sumner P. Hunt and Silas R. Burns. Photographed and documented the building according to Office of Historic Preservation guidelines, prepared State DPR forms, and assessed resource significance according to NRHP eligibility criteria. Work was performed before joining this firm.

Camp Radford National Register Evaluation, San Bernardino National Forest, San Bernardino County, CA
As Senior Historian, conducted NRHP evaluation of the early-20th-century Camp Radford recreational camp facility leased by the City of Los Angeles in the San Bernardino National Forest. Conducted historical and archival research on the Camp's history and development; its individual buildings; and its architects, Sumner P. Hunt and Silas R. Burns. Photographed and documented the building according to Office of Historic Preservation guidelines, prepared State DPR forms, and assessed resource significance according to NRHP eligibility criteria. Work was performed before joining this firm.

Papers and Presentations

The Development of Colonial Culture at the South African Cape of Good Hope: Examining the many "functions" of utilitarian ceramics. Paper presented at the Archaeology of Colonialism Symposium, Archaeological Institute of America Annual Meetings, January 2001.

Urban Archaeology and the Focus of Memory: a study in the history and narrative of South Central Los Angeles. Paper Presented at the Society for American Archaeology Annual Meeting, March 2002.

Historical Archaeology as Anthropology: Artifacts, Identities, and Interpretations in the Study of the Recent Past. Presented at World Archaeological Congress, January 2003.

Old Town Made New Again: The Archaeology of San Diego's First Settlement. Paper presented at the Society for California Archaeology Annual Meeting, April 2005.

Past as Present: Tourism and Archaeology in Old Town San Diego. Presented at the Society for Applied Anthropology Annual Meeting, April 2005.

The Face of Mercantilism at the South African Cape of Good Hope: Ceramics and the Hesitant Empire. Presented at the Society for Historical Archaeology Annual Meeting, January 2006.

A Patchwork History: Interweaving Archaeology, Narrative and Tourism in Old Town San Diego. Paper presented at the Society for American Archaeology Annual Meeting, March 2007.

Mannasse's Corral: The Life History of a Piece of Old Town. Presented to the Presidio Council, January 2008.

Making the Past Present: Archaeology, Heritage and Tourism in Old Town San Diego. Paper presented at the Society for California Archaeology Annual Meeting, April 2008.

CEQA and Historical Resources. Guest Lecturer, California Environmental Quality Act, UCSD Extension Course, August 2008.

Professional History
29 Years Senior Management Experience

Title
Transmission and Distrinution Market Segment Leader – West Region

Certifications & Registrations
Certified Professional Constructor #592, National

American Institute of Constructors #4543, National

Associations
Constructor Level Member, American Institute of Constructors

Chairman, Professional Standards Committee AIC (Past)

Member, Certified Professional Constructors' Certification Exam Committee (Past)

Board Member, Cleveland State College, Technical Advisory Committee (Past)

Shawn Kelly, a Senior Manager with AECOM, has over 37 years of experience. He is instrumental in building strong, thriving relationships with Owners and has served as the lead on a variety of successful projects in the power industries.

Shawn is a hands-on manager, with the ability to infuse teamwork and confidence in his staff – and with Owners. His attitude to every aspect of a project is teamwork, because a team approach results in a quality job and a safe working environment, so that a project completes on time and within budget.

Project Experience

President, Fru-Con Technical Services, Inc., St. Louis, MO - Responsibilities included the initial Performa to hiring, procedural systems and controls, financial forecasting, profit and loss, strategic planning, business development and contract/risk assessment. Executed successful start-up worldwide in multiple locations.

President, Fru-Con Engineering, Inc., St. Louis, MO - Responsible for the profit and loss, vision, leadership and turnaround of a 60-year-old engineering company. Completely reorganized overhead structure refocused business development efforts and changed the culture to accept more responsibility for work execution. Added project controls, purchasing, and reduced overall spending.

Sr. Vice President, Fru-Con Construction Corp., St. Louis, MO - Consolidated and created a regional division in the Southeast US while overseeing complete financial and technical performance responsibilities of both the Engineering and Technical Services Companies.

Director, Field Start-up Operations, Fru-Con Construction, St. Louis, MO - Responsible for the start-up of a waste-coal power facility in Pennsylvania and the completion of a very complex project in West Virginia.

Project Manager, Blount International Ltd., Portland, OR - Responsible for the successful execution of turnarounds and maintenance in the chemical industry; contract negotiations, budgets, recruiting, scheduling, safety, and profit and loss on projects to $30M.

Manager of Start-up, Blount International Ltd., Montgomery, AL - Responsible for successful turnover of all waste coal and refuse power facilities built or owned by Blount. Established start-up and testing procedures, documentation turnover packages operator training, and engineer/construction oversight. Daily customer interface on multiple projects and direction of multiple start-ups all. Started as a Project Controls specialist in home office for LUZ and Blount Energy Projects.

Director Pipeline/Transmission, GHR Transmission Corp., Houston, TX - Responsibility for managing staff on moving natural gas transmission from wellhead to customer.

Refinery Manager, GHR Energy Corp., Houston, TX - Responsibility for the management of a 300kbbl full-service refinery.

Manager of Construction, TCP Constructors (GHR), Houston, TX - Responsible for construction of $1.2B refinery expansion.

Vice President/General Manager, Dynalectric Corp. (ANECO Division) - Responsible for the profit and loss T&D, Industrial and Heavy Commercial Electrical Division Offices (6).