STATE OF CALIFORNIA

Energy Resources Conservation
and Development Commission

Application for Certification for the ABENGOA MOJAVE SOLAR POWER PLANT	)	Docket No. 09-AFC-5

ABENGOA MOJAVE SOLAR PROJECT
APPLICANT'S COMMENTS ON STAFF ASSESSMENT

ELLISON, SCHNEIDER & HARRIS L.L.P.
Christopher T. Ellison
Shane E. Conway
2600 Capitol Avenue, Suite 400
Sacramento, California 95816
(916) 447-2166 - Phone
(916) 447-3512 - Facsimile

Attorneys for Abengoa Mojave Solar Project

Abengoa Mojave Solar Project (09-AFC-5)
Applicant's Comments on Staff Assessment

INTRODUCTION

The following are the comments of Abengoa Solar Inc. on the Staff Assessment (SA) for the Mojave Solar Project (09-AFC-5) which was published on March 15, 2010. These comments are provided for the CEC Staff's consideration.

These comments are organized as follows:

In the first section, "Discussion of Major Comments," major comments are highlighted and supporting information provided for proposed changes.

In the text that follows this section, "Summary of Comments," proposed edits and comments are summarized and rationale for these changes provided. Where supporting documentation is referenced (e.g. maps or technical documentation), it is supplied in an Appendix to these comments.

Finally, attached to this document are "redline" pages excerpted from sections of the Staff Assessment (SA) to which edits are proposed. "Strikeout" is used to signify proposed text to be deleted and "double underline" signifies text to be inserted. Rationale for edits to Conditions of Certification (COCs) appear labeled as Rationale for Edits, and in bold, bracketed, italicized type below the proposed change.

DISCUSSION OF MAJOR COMMENTS

As discussed with CEC staff in the April 6, 2010 Public Workshop, the issues in the SA of major concern to the Applicant are in the areas of Land Use, Soil and Water Resources, and Biological Resources.

Land Use

The Applicant is requesting modification of COC LAND-1 which specifies mitigation for the loss of 1,588.5 acres of farmland. A detailed analysis of the reasons for requesting reconsideration of the quantity of farmland to be mitigated is provided in the Land Use section of the "Summary of Comments" that follows this section.

Soil and Water Resources

The Applicant's primary concerns in this section are the characterization in the SA of water use in the cooling tower and the use of evaporation ponds as inconsistent with LORS.

In the April 6, 2010 Public Workshop, to address the CEC's concerns with water use in the cooling tower, the Applicant proposed a conservation measure and also provided more refined estimates of proposed water use by the Project, which are detailed below is the "Summary of Comments" section. The Applicant also discussed issues with the dry cooling alternative and the use of a crystallizer to achieve zero liquid discharge (ZLD) rather than the sun's energy input.

As discussed at the Staff workshop, Applicant does not agree that the project as proposed is in violation of any applicable law, ordinance, regulation or standard (LORS). Indeed, Applicant was unable to discern from the workshop discussion which specific applicable LORS Staff is alleging the project fails to meet. The project is using brackish groundwater that is not subject to either the SWRCB's power plant cooling policies nor the CEC's 2003 IEPR policy.[1] Even if these policies were applicable, as discussed below Applicant has demonstrated that there is no feasible alternative to the proposed use that is reasonable for this project. Finally, and most importantly, Applicant's right to use this water for this purpose in the proposed amounts has been adjudicated and is the subject of a site-specific judicial decision applying all applicable California water laws, ordinances, regulations and standards. This decision is the law that governs this issue and the Applicant's proposed use in entirely consistent with this applicable law. Indeed, by seeking to abrogate Applicant's judicially adjudicated water right, Staff is failing to enforce an applicable LORS simply because it does not agree with the Court's decision. The Warren-Alquist Act does not confer upon the Commission the right to pick and choose which applicable laws to enforce in this manner. The Commission is bound to enforce Applicant's legal rights just as it is bound to enforce Applicant's obligations.
Nonetheless, to resolve this issue, the Applicant is proposing a water conservation plan that exceeds legal requirements. This plan involves sequestering an amount of water rights in the Mojave Basin Area on an annual basis for the life of the project equal to the amount of water withdrawn. During typical years, this is expected to be approximately 1,700 AF/y, for which the Applicant owns sufficient water rights. The proposed water conservation plan is described further in the attached redline of the Soil and Water Resources chapter attached to these comments.

Dry cooling would involve a structure approximately 130-150 feet in height, which would be precluded by the 60-feet height restrictions on the site because of the nearby Edwards Air Force Base. Further, the Applicant requests that Staff consider the noisiness of dry-cooling system fans, and potential impact on employees, neighbors, and nearby wildlife; and the fact that these systems are approximately 5% less efficient. This loss of efficiency means that for every 20 power plants built using dry cooling, one exists solely to compensate for the energy production lost as a result of using this method of cooling.

Likewise, evaporation ponds are far more energy efficient than a crystallizer to achieve ZLD. The use of the sun as the source of energy to concentrate the project's wastewater saves a significant amount of energy over employing a crystallizer to achieve the same purpose, without diminishing the plant's overall electricity generation.

Biological Resources

The primary proposed edits to the Biological Resources section of the SA are related to the fact that the transmission interconnection occurs within the permit boundary and will not create disturbance in the Superior-Cronese DWMA. This especially affects BIO-8 and BIO-9. A map showing the project boundary and interconnection location is provided in the Biological

[1] Applicant notes that neither of these policies are adopted regulations and, as such, comprise unenforceable "underground regulations."

Resources Appendix to this document. Please refer to the Transmission Appendix for additional details and supporting documentation regarding the interconnection.

Another significant concern is that BIO-19, Evaporation Pond Netting and Monitoring, as currently written, limits exclusion measures for birds and wildlife to netting. The Applicant would like the option of employing feasible and effective alternatives to netting, to minimize bird mortality and to ensure ability to comply with this COC given that no one has demonstrated the feasibility of netting a 5-acre pond used for evaporation purposes.

The Applicant proposes installation of technology at the evaporation ponds to exclude birds and other wildlife as well as a monitoring program to ensure the effectiveness of exclusion technology.

Multiple methods for avian protection are proposed in the *Evaporation Pond Monitoring/Remediation Action Plan*, submitted with Data Response 1A, Item 69, on December 23, 2009; and other feasible and effective technologies will be evaluated prior to pond construction. The Evaporation Pond Plan indicates that measures such as the steep side slopes and freeboard integrated into the design and operation of the ponds will minimize access to the ponds by birds. Technologies to be evaluated include anti-perching devices and hazing measures.

One system being considered for exclusion is the Bird Avert system. This system employs a combination of radar, and alarm zone hazing devices – which trigger only when birds or wildlife enter the alarm zone, to prevent them from habituating to the sounds or devices. Additional information, including USFWS contacts familiar with the system, is contained in the Biological Resources Appendix.

The redline of the Biological Resources chapter of the SA is attached to these comments with the Applicant's proposed edits.

SUMMARY OF COMMENTS

General Comments

1. In general, please clarify use of the word "approval" throughout the document, when given to agency other than the CEC who has the approval authority.
2. For clarity, please use terms defined in the Compliance Section of the SA throughout the sections, especially related to specifying time frames. For example, please change "30 days prior to start of project-related disturbance" to "30 days prior to start of construction-related ground disturbance."

Specific Comments on Engineering Assessment

I. Transmission System Engineering

Attached to these comments is a Transmission Appendix that contains a map showing the updated location of the proposed interconnection facilities. In addition, the Environmental Analysis for the Lockhart Substation Interconnection and Communication Facilities is contained in the Transmission Appendix.

Specific Comments on Environment Assessment

I. Air Quality

Please see the attached redline for the following changes.

3. **Page 5.1-45.** Proposed Condition of Certification (COC) AQ-SC-9 is amended. It may be difficult to obtain signatures from the residents in the area, so a means of notification independent of collecting signatures is needed for verification. This is consistent with a notification requirement on NOISE-1, p. 5.6-14.

4. District Conditions: Consistent with the CEC's direction at the April 6, 2010, Public Workshop, on March 4, 2010, the Applicant commented directly to the MDAQMD on the PDOC permit conditions which were incorporated into the SA. Specifically, the Applicant commented to the District on PDOC section 12 (permit conditions) for the HTF Ullage/Expansion System, including difficulty with pressure sensing for major spill detection (AQ-17, H); Cooling Tower condition 4 and daily operational duration restriction; Emergency Generator Conditions 4, 6, and 7; and a comment on Section 4.0 Control Technology Evaluation/BACT Determination regarding readiness testing of IC engines.

II. Biological Resources

Please see the attached redline for the Applicant's proposed changes. Also, a "Biological Resources Appendix" to this document is included to provide a map and drawings, evidencing that the DWMA will not be impacted, and providing information on one proposed evaporation pond exclusionary measure – the Bird Avert system.

III. Cultural Resources

The primary issue in the Cultural Resources section that the Applicant would like to draw the Staff's attention to the evaluation of P-36-006553 (see page 5.3-25) as a significant resource that may be impacted. There needs to be a correction: Due to an error in mapping, this site was erroneously identified as within the project area. It actually lies within the buffer area, and there will be no direct impacts to it. This error was apparently discovered before the Phase II testing, and was not evaluated further, but it was not communicated through a correction to the data request or in the testing and evaluation report. Applicant's cultural consultant just discovered this inaccuracy and apologizes for the omission.

Because the resource location map and revised DPR 523A form are confidential, they were sent to the CEC under confidential cover on April 20, 2010. Referring to these documents will provide the supporting evidence that this cultural resource actually is outside the project permit boundary.

Due to this correction, the mitigation measure CUL-8 which specifically outlines the treatment for this site, is unnecessary for protection of this resource.

Please see the attached redline for the following changes.

1. Reference to Proposed Condition of Certification CUL-8 requested to be removed for the rationale provided above.
2. **Page 5.3-14.** Reference to "project" area deleted. The study area included the project area PLUS a 200-foot buffer per CEC requirements; P-36-006553 is located in the buffer.

3. **Page 5.3-19 – 5.3-29.** The temporary numbers were reassigned permanent site numbers for the testing report. The temporary numbers are replaced by the official identifiers for the sites.

4. **Page 5.3-24.** Language concerning overall site was unclear; language added for clarity.

5. **Page 5.3-25**. Discussion of P-36-006553 deleted. This resource is not located within the project area, it is located within the CEC buffer. It would not be impacted by the project and was not included in Phase II testing.

6. **Page 5.3-30.** Summary of CRHR-Eligible Resources Subject to Potential Project Impacts deleted. This needs to be changed to say that the Staff Assessment found no significant cultural resources.

7. **Page 5.3-31.** Discussion proposed to be deleted. Propose removal all references to P-36-006553 as a significant resource.

8. **Page 5.3-45.** Proposed Condition of Certification CUL-8 is shown removed. CUL-8 is unnecessary with the determination that P-36-006553 is not located in the project site.

IV. Hazardous Materials Management

Please see the attached redline for the following changes.

1. **Page 5.4-7**. Added "or equivalent such as Dowtherm A." This was in our project description and should be change to either Therminol VP-1 or Dowtherm A becauseflexibility in the supplier would be best.

2. **Page 5.4-9**. Change made for consistency with proposed change to related COC.

3. **Page 5.4-17**. Proposed Condition of Certification HAZ-2 is amended. The proposed language is acceptable with a minor edit that would allow the discussion of proposed recommendations and once recommendations are finalized, through discussions between the above identified parties.
4. **Page 5.4-17**. Proposed Condition of Certification HAZ-4 is amended. The design of the solar field piping was considered by the Applicant between the time the application was filed and the Staff Assessment was released. This consideration included reviewing existing designs at the SEGS facilities near the project. The inclusion of remote, automatic valves on each loop would not likely result in the intended benefit since the location of a leak is difficult to identify by pressure or other automatic methods and could generate an unreliable facility. The Applicant's understanding is that the existing SEGS facilities utilize isolation valves on major headers (automatic or manual) along with manual valves to isolate loops. The isolation of a leak is performed by isolating the main header to a solar field section and the leak rapidly slows. These main isolation valves can be remotely operated. This action is followed by inspection and manual isolation of the leaking solar collector array loop. The Applicant is suggesting allowing for an isolation method that has proven successful in the past at SEGS.
5. **Page 5.4-18.** Proposed Condition of Certification HAZ-6 is deleted. The discussion in the SA at p. 5.4-13 concluded that the project was not subject to these requirements. The Applicant notes, however, that its 24-hour personnel meet the spirit of these requirements.
6. **Page 5.4-20**. Proposed Condition of Certification HAZ-7 is amended. The solar array includes many aspects, one of which is piping, which is relevant to the condition. Other aspects of the solar array including foundations, mirror structures, control and power wiring, and such should be able to begin independently of this condition.

V. Land Use

The Applicant's comments focus on proposed Condition of Certification LAND-1. Proposed Conditions of Certification LAND-2 and LAND-3 are acceptable. The Applicant proposes that COC LAND-1 be removed in its entirety, or modified from the mitigation of 1,588.5 acres to mitigation of 128 acres of farmland, based upon the information and analyses which follows. **On Page 4.5-26**, in the "Conclusions and Recommendations" of the Land Use section of the SA, it states:

- The proposed project would result in the permanent conversion of 1,588.5 acres of agricultural land to a non-agricultural use (i.e., a solar farm), which represents a significant impact. Therefore, staff recommends Condition of Certification **LAND-1**,

which requires the project owner to mitigate for the conversion of 1,588.5 acres of agricultural land to a non-agricultural use at a level not to exceed a one-to-one ratio.

Page 4.5-27 of the SA presents COC LAND-1:

LAND-1 The project owner shall mitigate for the loss of 1,588.5 acres of significant farmland, as defined by the California Agricultural Land Evaluation and Site Assessment (LESA) Model (DOC 1997), at a level not to exceed a one-to-one ratio.

BACKGROUND:
The CEC used two methods for evaluating the permanent conversion of agricultural land on the project site: 1) The Farm Land Mapping and Monitoring Program (FMMP) mapping criteria and 2) California Agricultural Land Evaluation and Site Assessment (LESA) Model, both defined by the California Department of Conservation (DOC).

FMMP Mapping

Under the standard FMMP mapping criteria, the majority of the site is designated as Grazing Land, Prime Farmland (71 acres), Farmland of Statewide Importance (57 acres), and Urban and Built-up Land. Prime Farmland includes lands with "the best combination of physical and chemical features able to sustain long-term agricultural production." Farmland of Statewide Importance is "similar to Prime Farmland but with minor shortcomings, such as greater slopes or less ability to store soil moisture. Land must have been used for irrigated agricultural production at some time during the four years prior to the mapping date."

CEC Staff Conclusion:

According to the thresholds for determining significance, the proposed project would result in a significant impact upon the conversion of Prime Farmland and Farmland of Statewide Importance as designated by the FMMP. Under this impact criterion, the applicant would be responsible for mitigation for the conversion of 128 acres of Important Farmland.

LESA Model

The LESA Model is composed of six different factors. Two "Land Evaluation" (LE) factors are based upon measures of soil resource quality; and four "Site Assessment" (SA) factors provide measures of a given project's size, water resource availability, surrounding agricultural lands, and surrounding protected resource lands. For a given project, each of these factors is separately rated on a 100 point scale. The factors are then weighted relative to one another and combined, resulting in a single numeric score for a given project, with a maximum attainable score of 100 points. It is this project score that becomes the basis for making a determination of a project's potential significance, based upon a range of established scoring thresholds.

California LESA Model Scoring Thresholds (DOC 1997, Table 9):

- 0 to 39 Points Not Considered Significant

- 40 to 59 Points Considered Significant (only if LE and SA subscores are each greater than or equal to 20 points)
- 60 to 79 Points Considered Significant (unless either LE or SA subscore is less than 20 points)
- 80 to 100 Points Considered Significant.

CEC Staff Conclusion:

The Final LESA score for the project site is 59.89. Both the LE and SA subscores for the proposed project site are over 20 points. Based on the California Agricultural LESA Thresholds , a score of 59.89 would result in a significant impact due to the permanent conversion of 1,588.5 acres of agricultural lands. The applicant would be responsible for mitigation of 1,588.5 acres of Important Farmland.

APPLICANT RESPONSE LAND-1:

1. **Evaluation of agricultural land use conversion through use of LESA is inappropriate for the Project site. The underlying land use, regardless of soil type, is not intended specifically for agriculture.**

The land use and zoning designations adopted by the San Bernardino General Plan within the Project site are exclusively Rural Living (RL). Adjacent and surrounding land in the Project study area are designated RL, RL-40 (Rural Living with a 40-acre minimum parcel size), and RC (Resource Conservation). There are no agriculturally designated parcels adjacent to the Project site. The purpose of the Rural Living land use and zoning designation is:

- To encourage appropriate rural development where single family residential use is primary.
- To identify areas where rural residences may be established and where associated related animal uses may be permitted.
- To prevent inappropriate demand for urban services.
- To establish areas where non-agricultural activities are the primary use of the land, but where agriculture and compatible uses may coexist.

The Project site should not be evaluated for land use conversion. Conversion has already occurred through previous land use designation and rezoning as per the San Bernardino General Plan. As specifically designated by the County's General Plan, the Project site's land use and zoning does not recommend primarily agriculture production. Non-agricultural activities, such as renewable energy facilities are more appropriate, and encouraged, for the site. The approved General Plan Vision for San Bernardino County should be taken into consideration, and take precedence, before subsequent steps are taken to assess loss of agricultural land on non-agricultural land.

2. Irrigation practices are not sustainable to support agriculture

Ninety percent of the proposed Project site is designated Prime Farmland and Farmland of Statewide Importance based on the underlying soil types. It is important to note that the designation of land with the Project site as Prime Farmland and Farmland of Statewide Importance is a function of a single 128 acre crop circle, located in the northeast corner, that continues to be irrigated. For all of the 1,588.5 acres of land to be used for agricultural purposes, irrigation practices are required. Not just for the 706 acres according to the "Prime Farmland if Irrigated" designation.

Records show that during agricultural periods using irrigation (1953 to 1986), water level decline due to agricultural pumping varied from 80 ft at the center of the former Lockhart Ranch to 20 ft in the area of Black's Ranch. A drop in water level of this magnitude without recovery indicates that groundwater extraction in the Harper Dry Lake area has historically exceeded recharge. Only after agricultural use declined in the 90's, did the groundwater levels recover. For 1990, the groundwater in storage was estimated to be 101,500 (Bookman Edmonston 1994). For 1997-98, extractions are estimated to have been 11,400 af urban use, 13,600 af for agricultural use, and 1,800 af for industrial and recreational use (MWA 1999).

This irrigation practice was, and will continue to be, unsustainable regardless of the constituents of the underlying soil and the resulting classification.

3. Groundwater for irrigation is marginal to inferior

The LESA Worksheet for Water Resource Availability (Staff Assessment (SA) page A-5, column B) lists the Harper Valley Groundwater Basin - part of the Centro Sub-Basin of the Mojave River Basin - as the Water Source. However, as noted on page 5.17-24 of the Mojave AFC, concentrations of boron, fluoride, and sodium are elevated in the Harper Valley Groundwater Basin and therefore the chemical character of the groundwater available from wells on or near the site is of marginal quality for domestic and agricultural use without treatment, such as using a reverse osmosis system. However, the necessity for this filtration system would potentially make agricultural production economically unviable.

LESA Model results inaccurately represent underlying physical conditions for water availability

The CEC Staff's implementation of the LESA model resulted in a Total Water Resource Score of 100, out of 100 (as shown on page A-6, SA) and a Weighted Factor Score (as shown on page A-10, SA) of 15 (out of a possible 15). The assumption is that irrigation is available in drought and non-drought without any physical or economic restrictions. These assumptions are inaccurate.

As defined by the LESA Instruction Manual, Step 4. (page 18), the project site is *physically* restricted as a result of "poor water quality" and potentially *economically* restricted from higher costs associated with mitigating for poor water quality. On the basis of an average pumping value of 5 acre-ft/acre, about 6,500 to 18,000 AFY of groundwater has been used for historical

agriculture production in the vicinity of the proposed MSP or about 2.1 AFY to 6 AFY per acre of land. The provision of a reverse osmosis filtration system to reduce the amount of mineral content in the groundwater would cost $4 million to 11.5 million per year ($1,200 per acre-ft), not including capital costs for the facility, to irrigate the project site.

Ultimately, irrigated agricultural production is NOT feasible, according to LESA guidelines, because:

1. There is NO existing irrigation system on the 1,588.5 acres of the project site that can serve the project site (882.5 acres Farmland of Statewide Importance and approximately 706 acres of Prime Farmland if Irrigated);
2. *Physical restrictions*, due to poor water quality, are severe enough to halt agricultural production; and
3. It may NOT be possible to achieve a viable economic return[2] on crops through irrigated production because of the increased cost to manage toxic levels of boron and sodium in the soil through filtration of the groundwater.

Applicant Conclusion: LAND-1

The CEC Staff's implementation of the LESA model resulted in a Total Water Resource Score of 100, out of 100 (as shown on page A-6, SA) and a Weighted Factor Score (as shown on page A-10, SA) of 15 (out of a possible 15). As a direct result of unsustainable irrigations practices and poor water quality, the assessment of Water Resource Availability is inaccurate. Sufficient water may be available for non-drought years, but there should not be an assumption that adequate water for agricultural production would be available in times of drought. In addition, the Project site does have physical and economic restrictions in both drought and non-drought years. As a result, the Water Availability Scoring should follow Option 11, not Option 1 (page A-6, SA). Following the criteria set forth in the LESA Instruction Manual, the Water Resource Availability could, and should be, **30** for the Total Water Resource Score and **4.5** for the Weighted Factor Score.

The current LESA score is 59.89. As a direct result of unsustainable irrigations practices and poor water quality, the SA score for Water Resource Availability should be 4.5 for the Total Water Resource Score and the Weighted Factor Score. The remaining scores are unchanged. Therefore, the new LESA score should be 45.49.

While this score still allows for significance, the LESA Scoring Decision (LESA Scoring Thresholds, page A-11, SA) states the project is "Considered Significant only if LE and SA subscores are each greater than or equal to 20 points." The new SA subscore is less than 20 (now, 19.5), as a result of the revised calculations, and therefore the project impacts to agricultural lands should not be considered significant.

[2] As stated in the LESA Instruction Manual: "The California Agricultural LESA Model does not specifically consider the issue of economic viability. The variables of economic viability for a specific farm include such factors as the financial management and farming skills of the operator, as well as the debt load and interest rates being paid by an individual operator, which are issues that cannot readily be included in a statewide LESA model."

As a result, the Staff Assessment recommendation based on the finding of significance from the LESA Model is inaccurate as the qualities of the site are not well-suited to agricultural development. Therefore, mitigation should not be based on LESA significance criteria.

In evaluating the results of the LESA or any model, the "rule of reason" must be applied. The result generated by the CEC indicates this is significant farmland. However, if one were to "calibrate" the model with known data, the fact that only 2% of surrounding land is in active farming would make it clear this is not excellent farmland; indicating that the model outcome generated was not rational in this case. Further data would reveal that the reason farming is not flourishing is because of water availability.
Furthermore, a COC such as LAND-1 discourages people from using previously disturbed land, and to develop projects on pristine land because it effectively removes a large incentive for developing disturbed property.

For these reasons, the Applicant is asking CEC Staff to remove LAND-1 in its entirety or modify this COC to reflect mitigation of 128 acres of farmland.

VI. Noise and Vibration

Please see the attached redline for the Applicant's proposed changes to this section.

VII. Soil and Water Resources

Please see the attached redline for the Applicant's proposed changes to this section.
Water Usage. The Applicant presented the following information verbally at the April 6, 2010 Public Workshop, and provides it in more detail here for the CEC's consideration in evaluating proposed water use by the Project.

Demonstrated Water Use at the SEGS Plants

A summary of the annual water use at the 80 MWe SEGS VIII and SEGS IX projects, from 1999 through 2002, is shown in Table 1.

Table 1
Annual Water Use at SEGS VIII and IX

	Annual Energy Generation, GWhe					
Year	SEGS VIII [1]	SEGS IX [1]	Solar production	Solar + gas production [2]	Water use, acre-ft/yr [3]	Unit water use, acre-ft/GWhe
1999	135,233	107,513	242,746	323,661	1,054	3.26
2000	140,079	128,315	268,394	357,859	1,189	3.32
2001	137,754	132,051	269,805	359,740	1,190	3.31
2002	138,977	137,570	276,547	368,729	1,221	3.31

Notes:
1) http://www.ornl.gov/sci/engineering_science_technology/world/renewable/Trough%20Technology%20-%20Algeria2.pdf
2) 75 percent solar thermal contribution; 25 percent natural gas thermal contribution
3) "Verified Production" in Appendix L of Mojave Basin Area Watermaster Annual Reports

For the 8 plant-years of operations, the average unit water demand was 3.30 acre-feet/GWhe of gross electric generation. These calculations assume the maximum natural gas allowance was used to generate the maximum potential electricity. If the entire 25% natural gas generation was not employed, then the actual electricity generation is overestimated in the above table, and the water use per GWhe is in reality higher than the 3.30 acre-feet.

The Applicant's estimate of *maximum* annual water usage, submitted to the CEC, was 2,163 acre-feet for the production of a gross 650 GWhe of electricity, for a 3.34 acre-feet/GWhe annual water usage. This *maximum* proposed water usage per GWh electricity generation for the Mojave Solar Project is approximately the same as the documented actual water consumption at operating solar electric facilities, arguably using the same water and subjected to the same climactic conditions as would be the Mojave Solar Project.

Projected Water Use at the Mojave Solar Plant

A more detailed analysis of the anticipated water demand for the Project was recently conducted by the Applicant's technical staff, a discussion of which follows.

The principal water demands at the Mojave Solar Plant include cooling tower evaporation, cooling tower drift, concentrated brine flow to the evaporation ponds, mirror wash water, miscellaneous Rankine cycle water and steam losses, and potable water.

The wet heat rejection system is based on conventional, mechanical draft cooling towers. The principal design parameters included the following:

- 42 °C design dry bulb temperature, and coincident 13 percent relative humidity
- 5.6 °C cooling water approach to a 17.8 °C wet bulb temperature
- 9.8 °C circulating water temperature range
- 240 MWt heat rejection duty, including 10.0 MWt from the closed cooling water system.

The cooling tower consists of 6 cells, each with a 150 kWe fan. The circulating water flow rate is a nominal 5,670 kg/sec, and the cooling tower makeup water flow rate at the design point is 124.93 kg/sec. Of the makeup water flow, 123.70 kg/sec is to compensate for evaporation losses, 0.028 kg/sec is to compensate for drift losses, and a net of 1.20 kg/sec is to compensate for brine losses from the cooling tower basin to the evaporation ponds.

To estimate the annual water use in the plant, the following calculations were performed:

1) A weather file was compiled for Harper Lake, listing for each hour of the year, the dry bulb temperature, the relative humidity, and the direct normal solar radiation.

2) For each hour of the year, the thermal output from the collector field was calculated by the Excelergy computer program.

3) The dry bulb temperature, the relative humidity, and the thermal input from the collector field were exported to the GateCycle program. The program calculated the steam turbine expansion efficiency, exhaust loss, steam enthalpy at the inlet to the condenser, condenser duty, circulating water temperatures, cooling tower duty, evaporation loss, and drift loss. The makeup water flow to the cooling tower was then calculated, assuming a constant flow rate of 1.20 kg/sec for brine losses to the evaporation ponds. To the cooling tower makeup flow was added the following water demands: 0.5 percent of the live steam flow rate for miscellaneous water losses due to drips and drains; 3.78 kg/sec for mirror cleaning water; and 0.30 kg/sec for potable water. The calculations were repeated for each of the 3,006 hours each year in which thermal energy was available from the collector field.

4) The following water demands were assumed to occur during each of the 5,754 hours in a year in which the Rankine cycle was not in operation: 1.20 kg/sec for brine losses to the evaporation ponds; 3.78 kg/sec for mirror cleaning water; and 0.30 kg/sec for potable water.

5) An annual sum of the water demand during both turbine operating periods, and turbine non-operating periods, was then made. The results of the calculation are shown in Table 2.

Table 2
Annual Water Use, Each 140 MWe Plant, acre-feet

	Cooling Tower Evaporation	Cooling Tower Drift	Brine to Evaporation Ponds	Mirror Cleaning	Potable Water	Cycle Water and Steam Losses	Total
Turbine in operation [1]	708.6	0.4	10.5	33.2	2.6	4.9	760.2
Turbine not in operation [2]	0.0	0.0	20.1	63.5	5.0	0.0	88.7
Annual Total	708.6	0.4	30.6	96.7	7.6	4.9	848.9

Notes:
1) 3,006 hours per year
2) 5,754 hours per year

The sum of the projected gross electric outputs from the two plants is 647.5 GWhe, for a unit water demand of 2.62 acre-ft/GWhe.

The projected water demand is approximately 20 percent below the historical demand of 3.30 acre-ft/GWhe for the latest SEGS projects. Nonetheless, calculated values do not carry the same credibility as demonstrated values. Further, the water use on the Mojave project may be higher than projected. For example, if the total dissolved solids concentrations in the groundwater are higher than estimated from the test wells, the required brine flow to the evaporation ponds will also be higher than projected. To maintain maximum flexibility in plant operations, we are requesting the use of groundwater quantities up to the original estimated value.

VIII. Traffic and Transportation

Please see the attached redline for the following changes.

1. **Page 5.10-19.** TRANS-1 is amended. At this time it is difficult to establish what the exact dispersal of labor and associate traffic distribution. This option offers flexibility for the Applicant to address the intent of the Condition with construction planning information.
2. **Page 5.10-20.** Proposed Condition of Certification TRANS-3 is amended. Pursuant to discussions at the April 6, 2010 SA Public Meeting, the CEC's intent is for the sub-surface conditions of the road to be evaluated visually, not through testing.
3. **Page 5.10-20.** Proposed Condition of Certification TRANS-4 is deleted and the Applicant requests it be reconsidered. During the SA Public Meeting on April 6, 2010, the CEC agreed to confirm whether the Applicant's project alone was prompting the need for the extended left-turn pocket on SR-58 at Harper Lake Road (to accommodate traffic from the west). Given that the impacts of construction are temporary, this measure seems excessive and controllable by monitoring and rerouting of traffic as needed and based upon conditions experienced during construction.
   Considering a majority of the deliveries will come from the Barstow area, the need to extend the turn pocket for traffic from the west was not obvious. If the need for the lengthened left-turn pocket is because of cumulative effects of another project, language should be added to require the projects share costs for the road improvement proportionally.

4. **Page 5.10-21.** Proposed Condition of Certification TRANS-5 is deleted. The referenced BNSF intersection already has train approach warning lights and barricades to alert and block traffic for the purpose of safety at the railroad crossing. To add flag men would be unnecessary. Additionally, deliveries are not affected by the BNSF crossing since for the same reason, it is lighted and with automatic barricades.

IX. Worker Safety

Please see the attached redline for the following changes.

1. **Page 5.14-23**. Proposed additional language for WORKER SAFETY-3 for clarity.
2. **Page 5.14-23**. Applicant requests reconsideration and removal of WORKER SAFETY-4 for the following reasons: For construction, the Applicant (project owner) will use an EPC contractor who observes OHSAS 18001 requirements which requires a very proactive HSE program with representation on behalf of the project. Project owner requires a safety person with each Subcontractor and a dedicated full time safety person when each group exceeds 15 people and incremental as designed by our criteria. A Safety Monitor is not necessary to maintain Cal/OSHA and Energy Commission safety requirements. As such, the additioin of

a Safety Monitor appears to be an unnecessary cost. Considering that CAL/OSHA has the right to inspect at any time, Applicant is unclear what function and benefit to the project the Safety Monitor would offer that the CSS, Site Construction Team, and Site Safety Teams could not provide.

3. **Page 5.14-23**. Proposed edits to WORKER SAFETY-5 for flexibility while achieving the same goal. The EPC company will have first responders attached to each scope of work who may or may not be the shift foremen. These first responders will be first aid and CPR trained, and receive the additional (AED) training. Each contractor and sub-contractor is required, contractually, to maintain this type of person at the site during any company-related activities.
4. **Page 5.14-23**. Proposed edits to the Verification for WORKER SAFETY-5 because no facilities or personnel are expected to be on site prior to mobilization, making the project owner unable to comply with the requirement as originally written.
5. **Page 5.14-24.** Proposed Condition of Certification WORKER SAFETY-6 is amended. The fixed amount is removed in order to leave the matter to negotiation subject to oversight by the CPM.
6. **Page 5.14-25.** Proposed Condition of Certification WORKER SAFETY-7 is amended. As discussed in the April 6, 2010 SA Workshop, the Applicant will conduct testing one month prior to construction-related ground disturbance, and if no Coccidioides immitis is detected, the mask requirement would be limited to those already in contained in OSHA requirements and worker safety plans, or could be reinstituted if a subsequent sampling event show presence of Coccidioides immitis.

Dated: April 21, 2010

ELLISON, SCHNEIDER & HARRIS L.L.P.

By _____

Christopher T. Ellison
Shane E. Conway
2600 Capitol Avenue, Suite 400
Sacramento, California 95816
Telephone: (916) 447-2166
Facsimile: (916) 447-3512

Attorneys for Abengoa Mojave Solar Project

owner to an agency, or 2) receipt of proposed modifications from an agency. The project owner shall submit all modified air permits to the CPM within 15 days of receipt.

AQ-SC9 The project owner shall offer to pay for temporary equivalent lodging to all residents that are located within one quarter mile of the project site fence line during the initial grading/site preparation phase of construction, for those periods of time when the initial grading/site preparation earthmoving activities may occur within one quarter mile of these residential properties. The project owner shall contact and provide this offer of temporary lodging to all residents affected by this condition at least one month prior to the start of initial grading.

Verification: The project owner shall provide ~~a written declaration~~ to the CPM a statement, signed by the project owner's project manager, stating that ~~signed by~~ the owner or residents of the properties ~~e~~affected by this condition have been notified and that the residents have ~~accepted or declined~~ been offered by the project owners ~~offer for~~ paid relocation during the affected period of the initial grading/site preparation phase of construction. The statement should list owners/residents notified and the means of notification. Additionally, in the Monthly Compliance Report the project owner shall provide documentation regarding any requests from the residents to be relocated for longer periods during construction and the project owner's actions to ~~meet~~ evaluate those requests.

[Rationale: It may be difficult to obtain signatures from the residents in the area, so a means of notification independent of collecting signatures is needed for verification. This is consistent with a notification requirement on NOISE-1, p. 5.6-14.

With regard to requests for ongoing relocation beyond initial grading, AQ-SC1 through AQ-SC4, and AQ-SC7 are intended to control air quality at the property fenceline. If extended relocation is requested, it should be evaluated based upon the effectiveness of control measures already in place.]

DISTRICT CONDITIONS

District Preliminary Determination of Compliance Conditions (MDAQMD 2010a)

Application No. 00010710 and 00010711 (Two - 21.5 MMBtu/hr Natural Gas Fired Auxiliary Boilers)

EQUIPMENT DESCRIPTION

Two 21.5 MMBtu/hr natural gas fired auxiliary boilers with low-NOx burner systems.

AQ-1 Operation of this equipment shall be conducted in compliance with all data and specifications submitted with the application under which this permit is issued unless otherwise noted below.

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

hydrophytic vegetation). The tamarisk stand is dying from lack of water. Other potentially jurisdictional waters include 9.44 acres of dry lakebed (alkali playa).

But for the Energy Commission's exclusive siting jurisdiction, waters of the State under the jurisdiction of CDFG and the RWQCB comprise 1.47 acres of lacustrine riparian extent (tamarisk scrub). However, the CDFG and the RWQCB do not typically exert jurisdiction over monotypic stands of tamarisk scrub. This acreage of tamarisk scrub does not include 1.59 acres of the aforementioned potentially USACE-jurisdictional wetlands, although potential waters of the U.S. are also potential waters of the state. The acreages of potentially jurisdictional waters of the U.S and state within the proposed project area are presented below in **Biological Resources Table 5**.

Biological Resources Table 5
Potential Jurisdictional Waters of the U.S. and/or State within the AMS Project Area

Type of Jurisdictional Waters	Type of Habitat (Holland 1986)	Type of Habitat (Cowardin et al. 1979)	Regulatory Authority	Area of Resource (Acres)
Wetland	Tamarisk Scrub (63810)	Palustrine; Scrub/Shrub, Needle-Leaved, Evergreen, Seasonally Flooded/Saturated, Mixosaline, Alkaline	USACE, CDFG	1.59
Other Waters	Playa Lakebed (46000)	Lacustrine, Littoral, Unconsolidated Bottom, Sand, Intermittently Flooded/Temporary, Hypersaline, Alkaline	USACE, CDFG	9.44
Total USACE Waters =				**11.03**
Lacustrine Riparian Extent	Tamarisk Scrub (63810)	Palustrine; Scrub/Shrub, Needle-Leaved, Evergreen, Seasonally Flooded/Saturated, Mixosaline, Alkaline	CDFG, RWQCB	1.47
Total CDFG Waters =				**12.50**[1]

Source: EDAW 2009d
[1]This total includes the 11.03 acres of potentially jurisdictional waters of the U.S. which are also potentially jurisdictional waters of the State.

Desert Tortoise Critical Habitat

Critical habitat is a formal designation under the federal Endangered Species Act for specific, legally defined areas that are essential for the conservation of desert tortoise, that support physical and biological features essential for desert tortoise survival, and that may require special management considerations or protection. Desert tortoise critical habitat extends north, west, and south of the proposed project area. The proposed project area does not overlap with any designated or proposed critical habitat

units; however, the Western Mojave Recovery Unit of desert tortoise critical habitat is located 0.7 mile southwest of the Beta site.

Superior-Cronese and Fremont-Kramer Desert Wildlife Management Areas

DWMAs are general areas recommended by the USFWS Desert Tortoise Recovery Plan (1994) within which recovery efforts for the desert tortoise would be concentrated. Nearest to the proposed project area are the Superior-Cronese and Fremont-Kramer DWMAs. Superior-Cronese DWMA is located north, east and south of the proposed project boundary and Fremont-Kramer is within five miles of the eastern boundary of the proposed project area. The Superior-Crones DWMA serves as a link between the east and west Mojave Desert tortoise populations, and it is likely that this is the only DWMA that will support the Recovery Plan target of 10 tortoises per square mile (USFWS 1994).

~~An 8-acre temporary equipment staging area for transmission line interconnection to the existing Kramer-Cool Water 230-kV transmission line would encroach on to private land within the Superior-Cronese DWMA at the southern edge of the Beta site.~~

[Rationale for Edits: Applicant proposes that this statement be removed because no staging of equipment associated with the project will occur within the Superior-Cronese DWMA. Even the communications upgrades planned by Southern California Edison occur in their ROW north of the DWMA.]

Mohave Ground Squirrel Conservation Area

The West Mojave Plan designated the 1,726,712-acre MGS Conservation Area and outlined goals to reestablish the MGS population within this area. Goals for the MGS Conservation Area include ensuring the long term protection of MGS habitat and ensure the long-term viability of the species by controlling off-road vehicle use, grazing and commercial activities. As illustrated in **Biological Resources Figure 1**, the MGS Conservation Area surrounds the AMS project and vicinity, which is within a 30 square-mile area that was excluded from this designation.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE

The threshold for determining significance is based on the biological resources present or potentially present within the proposed project area in consideration of the proposed project description. A proposed project would have a significant impact to biological resources, if it would:

- Have an adverse impact, either directly through take, or indirectly through habitat modification or interruption of migration corridors, on any state- or federally-listed species;
- Have an indirect or direct adverse effect on any sensitive natural community identified in federal, state or local plans, policies, or regulations;

- Interfere with the movement of any native wildlife species (resident or migratory) or with established native wildlife (resident or migratory) corridors; or
- Conflict with applicable federal, state, or local laws, ordinances, regulations, and standards protecting biological resources, as listed in **Biological Resources Table 1**.

DIRECT AND INDIRECT IMPACTS AND MITIGATION

The California Environmental Quality Act (CEQA) Guidelines define "direct" impacts as those impacts that result from the project and occur at the same time and place. Indirect impacts are caused by the project, but can occur later in time or farther removed in distance and are still reasonably foreseeable and related to the operation of the project. Significance of impacts is generally determined by compliance with applicable LORS; however, guidelines adopted by resource agencies may also be used.

This section analyzes the potential for direct and indirect impacts of construction and operation of the proposed project to biological resources and provides mitigation, as necessary, in an effort to reduce the severity of potentially adverse impacts. Staff recommends that a Designated Biologist and biological monitor(s) be assigned to ensure avoidance and minimization of the impacts described below and protection of the sensitive biological resources described above. Selection of the Designated Biologist and biological monitor(s) is described in staff's proposed Conditions of Certification **BIO-1** (Designated Biologist Selection) and **BIO-3** (Biological Monitor Qualifications); their duties and authority are described in staff's proposed Conditions of Certification **BIO-2** (Designated Biologist Duties) and **BIO-4** (Designated Biologist and Biological Monitor Authority), respectively. The Designated Biologist and/or biological monitor(s) would be responsible, in part, for developing and implementing the Worker Environmental Awareness Program (WEAP) (see Condition of Certification **BIO-5**), which is a mechanism for training the construction workers on protection of the biological resources described in this document.

Construction-Related Impacts and Mitigation

Construction Impacts to General Vegetation

Construction impacts to vegetation would occur through the direct removal of native plants during construction. These impacts are not usually considered significant unless the habitat type is regionally unique or is known to support special-status species. **Biological Resources Table 2** identifies the acreages of vegetation communities that would be subject to direct and permanent impacts within the project footprint. Several of these are disturbed native plant communities as well as active and fallow agriculture, with marginal habitat value for special-status species. However, the transmission line interconnection staging area would require temporary disturbance of six acres of undisturbed creosote bush scrub and 1.9 acres of undisturbed Mojave Desert wash scrub; this area is the highest quality habitat for special-status species. To mitigate impacts from loss of native vegetation within the transmission interconnection area, the temporary disturbance area would be revegetated after construction, per staff's proposed Condition of Certification **BIO-9** (Rehabilitation of Temporarily Disturbed Areas). Although desert vegetation takes a long time to recover once disturbed, staff expects that with implementation of **BIO-9** the creosote bush scrub within the

interconnection area could be fully restored with time. Additionally, **BIO-7** (Impact Avoidance and Minimization Measures) requires the boundaries of all temporary and permanent disturbance areas to be delineated and all work, vehicles, and equipment to be confined to these areas thereby preventing disturbance of native vegetation outside of the proposed project area.

Construction of the proposed project would not result in substantial loss of native vegetation or a regionally unique habitat type; with implementation of staff's proposed Conditions of Certification **BIO-7** and **BIO-9**, impacts to general vegetation would be less than significant.

Construction Impacts to General Wildlife

Direct loss of small mammals, reptiles, and other less mobile species could occur during construction of the proposed project. This would result primarily from the use of construction vehicles and grading equipment at the AMS site. Small burrowing animals (e.g., lizards, snakes, and small mammals) could be harmed through crushing of burrows, loss of refugia from predators, and direct mortality from construction activities. Construction activities and human presence could also alter or disrupt breeding and foraging behavior of common wildlife species.

Wildlife could become entrapped in open trenches during construction, especially if trenches remain open during inactive construction periods. In addition, common wildlife could experience increased predation levels from ravens and other predators attracted to the project area by introduced perching opportunities within the proposed project area. Common wildlife could also be disturbed by increased levels of noise and lighting. Implementation of staff's proposed conditions of certification for special-status species, as described in the following subsections, would effectively avoid and minimize potential impacts to common wildlife. Impacts would be less than significant.

Construction Impacts to Special-status Plants

No special-status plants were observed within the proposed project area during focused botanical surveys in 2007, 2008, and 2009. Three CNPS-listed plants were detected within 4000 to 4975 feet of the project area during surveys. One of these CNPS-listed plants, desert cymopterus (List 1B.2), has moderate to high potential to occur within the project area at the Kramer-Cool Water transmission interconnection site, due to the presence of suitable habitat and historic CNDDB occurrences. Desert cymopterus was not observed at the reference populations in 2008, which may be attributable to below average precipitation levels and therefore the determination of species absence within the project area maybe a false negative. Between March and May 2010, staff plans to re-survey areas within the project site with suitable habitat for desert cymopterus to confirm the 2007-2009 survey results; this would include visiting the reference sites to ensure populations are in bloom .

To avoid direct impacts to desert cymopterus potentially occurring within the project area, the applicant proposes to survey the transmission interconnection site and 200-foot buffer prior to electrical interconnection activities to verify that no desert cymopterus are established in the work area. Staff agrees with this applicant-proposed avoidance measure and has incorporated it, along with measures to follow if the species is

detected (i.e., avoidance or translocation), into staff's proposed Condition of Certification **BIO-8** (Rare Plant Pre-construction Surveys and Impact Avoidance).

Special-status plants adjacent to the proposed AMS project area may be crushed or otherwise damaged by construction equipment and vehicle or foot traffic. The potential for these direct impacts to occur is increased if construction equipment or personnel inadvertently work outside of the project boundary. Clear delineation of work areas and prohibition of work outside these areas, as proposed by the applicant (AS 2009a; pg. 5.3-41) and incorporated into staff's proposed Condition of Certification **BIO-7**, would avoid direct impacts to special-status plants.

~~Vegetation within the proposed Kramer-Cool Water transmission interconnection site at the southern boundary of the project area would be temporarily disturbed during electrical interconnection activities. As described above, this area provides suitable habitat for desert cymopterus and given records of a historic population and nearby observations during surveys, it is possible that this species could disperse and establish in suitable habitat within the interconnection site. Permanent or long-term degradation of the vegetation within the interconnection site would preclude any potential future establishment of desert cymopterus, or other rare plants. However, adequate revegetation and rehabilitation of temporarily disturbed areas, as described in staff's proposed Condition of Certification **BIO-9**, would minimize this impact. Staff, CDFG, and USFWS recommend avoidance of any areas of undisturbed vegetation south of the existing transmission lines within the proposed transmission interconnection site. If this is infeasible, staff's proposed Condition of Certification **BIO-7** would require impacts to be confined to the smallest area possible.~~

[Rationale: Applicant proposes that this statement be removed because all surface disturbance associated with the project will occur inside the Project Area.]

Rare plant populations adjacent to the AMS project area could also be indirectly affected by construction due to increases in wind-blown dust. Disturbance of the soil surface caused by construction traffic, grading, and other construction activities would result in increased wind erosion of the soil. Aeolian (wind-borne) transport of dust and sand can result in the degradation of soil and vegetation over a wide area (Okin et al. 2001). Impacts to vegetation may include killing plants by burial and abrasion, interrupting natural processes of nutrient accumulation, and allowing the loss of soil resources. Dust abatement, as described in Conditions of Certification **AQ-SC3** and **AQ-SC4** is recommended to minimize these impacts.

Direct and indirect impacts to special-status plants adjacent to the proposed AMS site would be avoided or minimized by implementation of staff's proposed Conditions of Certification **BIO-7**, **BIO-8**, **BIO-9**, **AQ-SC3,** and **AQ-SC4**. If rare plants (e.g., desert cymopterus) are detected in the project area during pre-construction surveys, measures outlined in Condition of Certification **BIO-8** would mitigate impacts to less than significant levels.

Construction Impacts to Special-status Wildlife

The loss of portions of the approximately 1,765 acres Project Site would result in a decrease in ~~of~~ habitat of some special-status species. However, the specific habitat loss of various species ranges from approximately 430 acres of marginal desert tortoise and Mojave ground squirrel. The project is expected to partially displace home ranges and reduce carrying capacity for raptors and ravens that forage over the site, especially due to the open ruderal and active agricultural areas and the availability of prey from mowing and tilling practices. Northern harrier, short-eared owl, ~~loggerhead shrike, LeConte's thrasher, California horned lark,~~ Swainson's hawk, ~~golden eagle,~~ burrowing owl, ~~Mohave ground squirrel, and desert tortoise, all of which may utilize disturbed agricultural lands, particularly when they adjoin higher-quality habitats.~~ and, potentially, golden eagle and Swainson's hawk, could be affected. Loggerhead shrike would also lose some foraging and, potentially, nesting habitat. The loss of access to habitat within the proposed project area and the resultant fragmentation, could ~~would~~ lead to reduced reproductive success, increased adverse edge effects on adjoining lands, and an overall reduction in the area's capacity to support these species. Species-specific impacts and proposed avoidance, minimization, and mitigation measures are discussed in the following sub-sections. Elevated noise and lighting from construction activities may also affect special-status species; these potential impacts are discussed below under **GENERAL CONSTRUCTION IMPACTS**.

[Rationale for Edits: Applicant wants to clarify that the entire project site acreage is not considered special-status species habitat, and that each special-status species has varying amounts of habitat, at different levels of habitat quality, as indicated by biological studies conducted of/and surrounding the project site. Any potential adverse effects of the loss of access to habitat in the Project Area are uncertain, especially as they relate to reproductive success. However, for MGS and desert tortoise, the habitat fragmentation exists due to agriculture and not due to the project, as stated by staff.]

Migratory/Special-status Birds

The majority of the proposed project area is devoid of trees due to current and past agricultural operations. Scattered tamarisk trees, which provide suitable nesting substrate for a variety of birds, occur along the western edge of Harper Lake and along some roadsides adjacent to agricultural fields. Suitable nesting habitat is also available within the desert saltbush scrub and Mojave creosote bush scrub within the project area. Northern harrier, short-eared owl, loggerhead shrike, ~~LeConte's thrasher~~, and ~~California horned lark~~ are special-status species likely to breed and forage at the proposed project area. Focused surveys for nesting Swainson's hawk will be conducted in spring 2010. However, 95% of the California population exists in the Central Valley (CDFG 2005) and there are no known breeding pairs east of Palm Springs (Anderson 2009). Therefore, it is unlikely that nesting Swainson's hawks occur in the vicinity of the AMS project area. Western burrowing owls, which also occur at the proposed AMS site, are discussed below. Additionally, some common bird species adapted to disturbed and transitional environments could nest in equipment or other available substrate within and surrounding the proposed project area.

The loss of active bird nests or young is regulated by the federal Migratory Bird Treaty Act and Fish and Game Code section 3503. Additionally, impacts to golden eagles are regulated by the Bald and Golden Eagle Protection Act (BGPA). Construction activities during the nesting season (February through September) could adversely affect breeding birds through direct take or indirectly through disruption or harassment, which may ultimately result in nest failure or abandonment.

The applicant proposes to conduct pre-construction breeding bird surveys (AS 2009a, pg. 5.3-49). Staff incorporated this applicant-proposed measure into Condition of Certification **BIO-10** (Pre-construction Nest Surveys and Impact Avoidance Measures for Migratory Birds), which provides additional detail on survey timing and measures to avoid disturbance to active nests and ensure compliance with the Migratory Bird Treaty Act. With implementation of staff's proposed Condition of Certification **BIO-10**, significant impacts to nesting birds would not result from proposed project construction activities. Potential impacts to nesting golden eagle are discussed below.

In addition to the aforementioned special-status bird species, Swainson's hawk, American peregrine falcon, Cooper's hawk, Merlin, and prairie falcon are special-status birds that are known to forage within the proposed AMS site. Due to observations proximate to the project area and the presence of suitable habitat, it is likely golden eagles could also utilize the project area for foraging. Project construction would result in the loss of 1,644 acres of suitable foraging habitat, including fallow and active agricultural areas and scrub habitat. Although Swainson's hawk are adapting to the conversion of natural habitat throughout the Central Valley by foraging within agricultural lands, Swainson's hawk, especially in the desert, do not rely solely on agricultural lands for foraging. In desert habitat, Swainson's hawks will eat animals not associated with agriculture, such as reptiles and other small birds.

Siting large-scale solar projects on disturbed agricultural land is preferable to siting them on undisturbed land, both of which provide foraging habitat for Swainson's hawk and other raptors, because development of undisturbed land in the Mojave Desert results in greater biological impacts to more species (e.g., desert tortoise and MGS). However, conservation of Swainson's hawk foraging habitat in the desert is necessary given the rapid pace of development in the Mojave; to this end, CDFG is developing a region-wide plan (Weiss 2009). However, approved guidance is not in place. In light of the tradeoffs to developing undisturbed land and given the availability of natural lands nearly surrounding the project area, loss of Swainson's hawk foraging habitat in the form of active and fallow agricultural land within the project area is considered adverse, but less than significant, and no mitigation is proposed.

Golden eagles are extremely susceptible to disturbance during the breeding season. Given the lack of suitable nesting substrate proximate to the project area (i.e., cliff ledges, rocky outcrops, or large trees), it is unlikely that golden eagles are nesting close enough to the proposed project area to be disturbed by construction or operation activities. However, golden eagle nesting surveys are necessary to substantiate this. Although disturbance to nesting eagles is not anticipated, the project would result in loss of foraging habitat for this species. Significant impacts to golden eagle would occur if the indirect effects of a reduced prey base caused by development of the AMS result in loss of productivity or abandonment of nesting territories. To determine whether the

proposed project area constitutes an important foraging area for golden eagle, a nesting survey is required to determine whether the project area is within foraging distance of an active nest (an average of 7.7 to 12.7 square miles (Kochert 2002)) and an assessment of this species usage of the area for foraging needs to be conducted. As guidance becomes available regarding implementation of the revised BGPA, staff encourages the applicant to coordinate closely with USFWS to determine the scope of golden eagle nesting survey and foraging habitat assessment. Further coordination with USFWS and analysis of the applicant's survey results and foraging habitat assessment are required to determine whether construction of the proposed project would result in significant impacts to golden eagles.

Desert Tortoise

Protocol surveys conducted in 2007, 2008, and 2009 did not identify a resident population of desert tortoise within the project area. However, in 2006 a single live tortoise was observed in the project area. Higher concentrations of desert tortoise and sign were recorded immediately east and west of the project area. Although the majority of the 1,765-acre proposed project area is disturbed and lacks suitable forage and burrow sites for this species, transient individuals could occur within the portions of the site that support disturbed fallow saltbush scrub and desert wash scrub. Desert tortoise likely access this habitat from the Mojave creosote bush scrub and desert saltbush scrub to the east south and west of the AMS site. A burrow was observed in 2009 within the temporary transmission interconnection area and several other sign were recorded along the eastern edge of the project area, ~~suggesting that tortoise may be attempting to move into the disturbed areas of the project site that are re-establishing saltbush scrub vegetation. The 8-acre proposed transmission interconnection site provides the highest quality undisturbed desert tortoise habitat within the project area and is within the Superior-Cronese DWMA.~~

[Rationale for Edits: 1) Sign observed along the edge more likely indicates that tortoises stopped at the boundary of non-habitat, not that they were trying to move into non-habitat.

2)Applicant proposes that this statement be removed because no staging of equipment associated with the project will occur within the Superior-Cronese DWMA. Even the communications upgrades planned by Southern California Edison occur in their ROW north of the DWMA.]

Direct mortality, injury, or harassment of desert tortoise could result from encounters with construction vehicles or heavy equipment. Tortoises could be crushed or entombed in their burrows during site grading or other ground disturbing activities. Increased human activity in tortoise-occupied areas and excessive noise or vibration from the heavy equipment would disrupt the breeding and foraging behavior of desert tortoises. Desert tortoise would be attracted to any pooled water in the construction area that resulted from application of water to control dust, placing them at higher risk of injury or mortality from construction activities or predators (e.g., ravens, coyotes) that are also attracted to the water and human-provided scavenging opportunities. Also, tortoise may take shelter under parked vehicles and be killed, injured, or harassed when the vehicles are moved. These potential impacts to desert tortoise would be considered significant

without mitigation. Impacts to tortoise from increased traffic during construction are discussed below under **CONSTRUCTION TRAFFIC**.

To avoid and minimize these direct and indirect impacts, the applicant proposes to control standing water, reduce speed limits to prevent road kills, conduct worker environmental awareness training programs, and implement other general measures. Staff has incorporated these applicant-proposed measures into Condition of Certification **BIO-7**. In addition, installation of tortoise-proof exclusion fencing and gates to keep desert tortoise out of construction areas followed by comprehensive clearance surveys and translocation of any individuals in the project area would ensure that there are no tortoise in the project area prior to construction activities. Based on survey results and habitat quality within the proposed project area, it is anticipated by staff, USFWS, and CDFG that few, if any, tortoises would require translocation. These efforts to exclude tortoise from the project area would avoid direct construction related impacts; refer to staff's proposed Condition of Certification **BIO-11** (Desert Tortoise Exclusion Fencing, Clearance Surveys, and Translocation Plan) for additional detail about clearance survey, exclusion, and translocation procedures. Also, the applicant is preparing a draft Desert Tortoise Translocation Plan for review and approval by staff, USFWS, and CDFG. Additional measures from this Plan will be included in conditions of certification or incorporated by reference, as deemed appropriate.

In addition, the proposed project would result in the loss of approximately 430 acres of marginal desert tortoise habitat (refer to **Biological Resources Table 6**) and would exclude tortoise by fencing approximately 1,765 acres within an area surrounded by land designated as critical habitat or DWMA. Construction of a desert tortoise exclusion fence at the perimeter of the plant site could adversely affect desert tortoise by further constricting connectivity between established populations on the east and west sides of the proposed project and precluding future establishment within the proposed project area. An existing barrier to connectivity is the desert tortoise exclusion fencing along 95% of Harper Lake Road between Highway 58 and Lockhart Road (Nicholson 2009). It is uncertain whether there is currently any contact between these populations; however, the potential for gene flow between them exists through randomly interspersed gaps in the fence. Interpopulation connectivity is essential to maintaining genetic diversity within the species; this was identified as an integral factor to desert tortoise recovery (USFWS 2008). The Harper Lake area has not been identified as a regional linkage (CalWild 2000) and although fencing the project area and Harper Lake Road could potentially constrict local connectivity, this is not likely essential to the continued persistence of the populations within the Superior-Cronese DWMA on the east side of Harper Lake Road and the Western Mojave Recovery Unit on the west side of Harper Lake Road. Although impacts to population connectivity would be adverse but less than significant, loss of 430 acres of desert tortoise habitat would be significant without mitigation. Preservation and enhancement of land within the range of this species, particularly high quality habitat within existing critical habitat, would fully mitigate impacts from loss of marginal desert tortoise habitat within the proposed project area. Refer to **HABITAT COMPENSATION** below for additional information and acreage amounts.

In summary, potential direct and indirect impacts to desert tortoise within and adjacent to the proposed AMS site would occur during construction activities through mortality, injury, disruption, harassment, and habitat loss. These potential impacts to desert

tortoise would be considered significant without mitigation. Ensuring that no tortoise are within the construction area by translocating any individuals found onsite and excluding tortoise from hazardous construction areas (**BIO-11**) as well as implementing general impact avoidance and minimization measures (**BIO-7**) would minimize impacts. Mitigation for loss of 430 acres of habitat would be achieved through preservation and enhancement of compensatory habitat as described below under **HABITAT COMPENSATION** and in staff's proposed Condition of Certification **BIO-15** (Compensatory Mitigation). Implementation of these conditions of certification would fully mitigate direct and indirect impacts to the federally and state-threatened desert tortoise.

Mohave Ground Squirrel

As describe above, the majority of the project area lacks suitable habitat to support a substantial resident MGS population; however, the native vegetation east (undisturbed creosote scrub) and west (undisturbed desert saltbush scrub and creosote scrub) of the proposed project area provides high quality suitable habitat for MGS and therefore transient MGS may occur onsite. An adult female was trapped immediately south of the proposed project area at the edge of the active alfalfa field.

MGS moving through the project area or across access roads between patches of adjacent suitable habitat may be struck by construction vehicles of equipment. There is the potential that resident MGS may establish within the project area in patches of suitable habitat in advance of construction activities; these individuals may be crushed or entombed in their burrow by site grading or other ground disturbing activities. Resident MGS proximate to the proposed project boundary may be disturbed or harassed by ground vibration and noise as well as human presence during construction; this could adversely affect breeding and/or foraging behavior. In addition, the impermeable fence may lead to increased predation on MGS because the fence could impede escape routes. Assuming construction activities are confined to the fenced perimeter of the site, destruction of MGS burrows surrounding the project area would not occur.

Exclusion or relocation of MGS is difficult because this species is difficult to trap and can easily burrow under or climb over exclusion fencing. Also, MGS are difficult to visually detect because they spend the majority of their time underground in burrows. Nonetheless, direct impacts to MGS within the project area would be avoided and minimized to the extent possible by attempting to trap and relocate any individuals within the exclusion fence surrounding the project area. Visual surveys subsequent to installation of exclusion fence and immediately prior to ground disturbing activities would be conducted to identify MGS. Traps would be set for these individuals and if captured, they would be safely relocated to suitable habitat adjacent to the proposed AMS site. These proposed relocation measures are detailed in staff's proposed Condition of Certification **BIO-12** (Mohave Ground Squirrel Clearance Survey). In addition, the general impact avoidance and minimization measures described in Condition of Certification **BIO-7** would require escorts immediately ahead of equipment during vegetation removal and grading activities and removal of any MGS attractants (e.g., human food, trash) from the project area, thereby further reducing the potential for adverse impacts to MGS.

In addition, the proposed project would result in the loss of approximately 430 acres of marginal MGS habitat (refer to **Biological Resources Table 6**) and would fence approximately 1,765 acres within an area surrounded by land designated by BLM as Mohave Ground Squirrel Conservation Area. Within this conservation area, four core MGS populations and four other major populations have been identified (Leitner 2008b). The proposed project is located between the Edwards Air Force Base core population and Coolgardie Mesa-Superior Valley core population, which are separated by approximately 25 to 30 miles. Ensuring sufficient connectivity to allow gene flow between core populations is an important conservation goal. However, there is not a wildlife movement corridor across the Harper Valley area between the Edwards Air Force Base and Coolgardie Mesa-Superior Valley core populations (Leitner 2008b). Therefore, development of the proposed project is not expected to constrain regional MGS population connectivity. Although impacts to population connectivity would be adverse but less than significant, loss of MGS habitat is considered significant without mitigation. Preservation and enhancement of land within MGS range, particularly high quality habitat within or adjacent to the MGS Conservation Area, would fully mitigate impacts from loss of marginal MGS habitat within the proposed project area. Refer to **HABITAT COMPENSATION** below for additional information and acreage amounts.

In summary, potential direct and indirect impacts to MGS within and adjacent to the proposed AMS site would occur during construction activities through mortality, injury, disruption, harassment, and habitat loss. These potential impacts to MGS would be considered significant without mitigation. Attempting to relocate any individuals onsite (**BIO-12**) and implementing the general impact avoidance and minimization measures (**BIO-7**) would minimize impacts. Mitigation for the loss of 430 acres of habitat would be achieved through preservation and enhancement of compensatory habitat as described below under **HABITAT COMPENSATION** and in staff's proposed Condition of Certification **BIO-15**. Implementation of these conditions of certification would fully mitigate direct and indirect impacts to state-threatened MGS.

Western Burrowing Owl

Burrowing owls, a California species concern, nest and forage within the proposed project area and could be directly and indirectly impacted by construction of the AMS project. Potential impacts to this species include direct mortality from encounters with construction equipment, burrow/nest destruction during site clearing/grading, entombing burrowing owl adults, eggs, or young, and disruption or harassment. Disruption or harassment may result in nest abandonment or otherwise reduced reproductive success. In addition, project construction would result in the loss of approximately 1,644 acres of suitable foraging habitat, including fallow and active agricultural areas and scrub habitat. These potential impacts to burrowing owls would be considered significant without mitigation. However, based on the CBOC and CDFG guidelines, impacts and mitigation to burrowing owl nesting and foraging habitat are based on the number of burrowing owl pairs (or individuals assumed to be pairs) displaced by a project. The CBOC/CDFG guidelines recommend replacement of 6.5 acres of burrowing owl habitat per pair (or per individual assumed to be a pair) displaced, as determined through a pre-construction survey.

[Rationale for Edits: Although 1644 acres of the Project site have habitat variables that are conducive to use by burrowing owls as foraging habitat, Project surveys indicate that owls do not consistently use the Project area as foraging habitat. The Applicant recommends the proposed revision to clarify this situation, and to further clarify that the mitigation requirements for impacts to burrowing owls (to both nesting habitat and foraging habitat) is to be based on the CBOC/CDFG guidelines.]

To identify burrowing owls within the proposed project impact area, the applicant has proposed conducting preconstruction surveys on the AMS site, using methods recommended by CDFG (CBOC 1993; CDFG 1995). To avoid direct take of owls, the applicant has also proposed passive relocation of individuals from the construction area to adjacent areas of contiguous suitable habitat. Passive relocation involves excluding the owls by use of one-way doors, at which point they may take residency in nearby artificial or natural burrows or disperse to another area (CDFG 1995). Passive relocation of owls is only implemented during the non-breeding season in order to avoid egg and dependent chick separation from adult owls, which would likely result in death of those eggs and young. In order to monitor relocation success and at the request of USFWS, burrowing owls within the AMS project area would be trapped and color-banded prior to implementation of passive relocation efforts. The applicant proposes to monitor the relocation area for a minimum of five years after initiation of passive relocation. Staff agrees with this condition and has incorporated it as well as preconstruction survey and other passive relocation requirements as well as monitoring and reporting requirements into Condition of Certification **BIO-13** (Burrowing Owl Impact Avoidance, Minimization, and Habitat Compensation).

Although passive relocation would be conducted to avoid direct mortality of owls within the proposed project area, previously occupied burrow(s) would be destroyed and foraging habitat would be degraded; therefore habitat compensation is required to reduce these impacts to less than significant levels. The location and amount of compensatory habitat required to fully mitigate impacts to burrowing owl is based on the number of impacted owls and assumes that currently occupied habitat will be replaced with nearby occupied habitat. Due to variation in the number of burrowing owls observed during annual surveys of the proposed project area and vicinity (4 in 2006, 3 in 2007, 1 in 2008, 1 in 2009), CDFG has determined that the appropriate census to use to calculate habitat compensation for this species shall be determined based on 2010 pre-construction surveys. The methodology for this calculation is pursuant to CDFG guidance, which recommends 6.5 acres of habitat per unpaired individual or pair of relocated owl(s) and a 5:1 replacement ratio for creation of artificial burrows (CDFG 1995). These mitigation requirements are described in staff's proposed Condition of Certification **BIO-13**.

In summary, direct and indirect impacts to burrowing owl resulting from construction of the proposed project would be mitigated to less than significant levels through pre-construction surveys and passive relocation of owls within the project footprint as well as acquisition of compensatory habitat and monitoring the relocated owls on the acquired parcel(s). These measures were adapted, in part, from the applicant-proposed Western Burrowing Owl Management and Monitoring Plan (AS 2009a, pg. 5.3-48), in

consultation with CDFG and USFWS; refer to Condition of Certification **BIO-13** for details.

American Badger and Desert Kit Fox

One American badger den and two desert kit fox dens were observed within the proposed project area; these species are considered present on the proposed project area. Construction activities, including site grading and heavy equipment operation, could kill or injure American badgers and desert kit foxes from contact with construction equipment or entombment in their den. Construction activities could also result in disturbance or harassment of individuals. Impacts to American badger and desert kit fox would be avoided or minimized by excluding these animals from the project area prior to construction activities. To this end, staff proposes Condition of Certification **BIO-14** (American Badger and Desert Kit Fox Impact Avoidance and Minimization Measures), which requires that a qualified biologist perform a preconstruction survey for badger and kit fox dens in the project area and a 250-foot buffer concurrent with desert tortoise surveys. Outside of the whelping season (i.e., not February 1 to September 30), individuals would be excluded from dens and the dens would be collapsed once confirmed vacant. This passive relocation technique encourages excluded animals to take residency in nearby habitat or disperse to another area. Implementation of this condition would avoid and minimize impacts to American badger and desert kit fox potentially resulting from project construction activities.

Construction Traffic

Roads and highways are ubiquitous landscape features that have a variety of direct (e.g., road mortality) and indirect effects (e.g., habitat fragmentation, proliferation of non-native and predatory species) on surrounding wildlife populations, including desert tortoise (Boarman and Sazaki 2006; Boarman 2002; Jennings 1997; USFWS 2008). The proposed project would not require construction of a new road; however, access by construction personnel and equipment would increase existing traffic levels along Harper Lake Road between State Route 58 and the proposed AMS site. During the peak project construction phase, it is estimated that approximately 490 additional trips per day would be required to transport 1,162 workers (AS 2009a, pg. 5.13-16).

The majority of Harper Lake Road has desert tortoise exclusion fencing; however, some areas along the roadway are unfenced at the request of private property owners or at intersections with utility crossings and roads (Nicholson 2009). Tortoise and other wildlife can access Harper Lake Road at these gaps in the exclusion fence and be forced to travel along the road, unable to cross the fence at the other side. These animals are especially vulnerable to vehicle collisions. Increased mortality of desert tortoise and other special-status wildlife due to collisions with project vehicles is a significant impact.

Further, roads and highways are the primary barrier to habitat connectivity and species movement in the west Mojave Desert (CalWild 2000; USFWS 2008); local connectivity constraints within the conservation areas (i.e., DWMA, desert tortoise critical habitat, MGS conservation area) would be exacerbated by increased traffic levels associated with project construction.

Environmental awareness training for workers traveling to and from the project area as well as adherence to posted speed limits may reduce traffic mortality to wildlife along Harper Lake Road and project access roads. These impact avoidance and minimization measures are described in staff's proposed Conditions of Certification **BIO-5** and **BIO-7**, respectively. In addition, monitoring Harper Lake Road during construction and moving any desert tortoises or other vulnerable wildlife found within the roadway or shoulder would further reduce the potential for vehicle/wildlife collisions and may even prevent mortality of wildlife along Harper Lake Road and project access roads. Road monitoring requirements are presented in staff's proposed Condition of Certification **BIO-7**, which include moving any tortoises trapped within the fenced roadways, escorting equipment or vehicles moving though unfenced areas, and checking beneath vehicles for tortoises or other wildlife before driving. Road kill reporting, per Condition of Certification **BIO-7**, would serve as an indicator of the effectiveness of these measures. Implementation of the impact avoidance and minimization measures in staff's proposed Conditions of Certification **BIO-5** and **BIO-7** would reduce impacts to special-status wildlife from construction traffic to less than significant levels.

Habitat Compensation

The objective of compensatory mitigation is to offset, to the extent practicable, adverse impacts (i.e., take, displacement effects, and habitat loss) of the proposed project by providing compensatory mitigation lands with some biologically relevant nexus to the impact. The mitigation lands should maintain the number and the range of the impacted species by creating new functional habitat, enhancing or restoring existing functional habitat, and/or initiating management actions in habitats to increase function (carrying capacity) and reduce/control adverse conditions (exotics, nest predators).

The California Code of Regulations, Section 783.4 stipulates that an incidental take of a state-listed species can be issued only when an applicant has minimized and fully mitigated the impacts of the proposed taking, including all impacts on the species that result from any act that would cause the proposed taking. Section 783.4 also states that measures must be capable of successful implementation.

Compensatory Mitigation Acreage and Location

Staff recommends that a minimum of 118.2 acres of high quality suitable habitat be managed and protected in perpetuity by conservation easement in order to fully mitigate the permanent direct, indirect, and cumulative impacts to desert tortoise ~~and~~ MGS and western burrowing owl resulting from development of the AMS project area. Habitat conditions on the proposed mitigation site include factors favorable to occupation by all three species. The mitigation site is within lands designated as Critical Habitat for the desert tortoise, with documented sign of the species (live desert tortoise, and tortoise burrows on and adjacent to the mitigation site). The area is also within the Mohave ground squirrel Conservation Area, and is coincident with species observation data in the California Natural Diversity Database. The mitigation site has existing animal burrows favorable to occupation by burrowing owls; friable soils, washes, and drainages into which fossorial animals can excavate burrows which burrowing owls could later occupy; and rocky outcrops on the north end of the site from which burrowing owls could hunt. ~~This is in addition to any compensatory habitat requirements for burrowing owl, which are described above under **WESTERN BURROWING OWL**.~~

If, upon final analysis, the entire mitigation requirement cannot be satisfied with the proposed site, the mitigation requirement will be satisfied either with additional lands, or with the payment of an in-lieu fee to be agreed upon by all applicable parties.

The recommended acreage of compensation land reflects consideration of several factors. The habitat quality of the project area, proximity to the compensation area to natural lands (e.g., DWMA, desert tortoise critical habitat, MGS conservation area), and the habitat quality of the compensatory mitigation lands affects the number of individuals those lands can support. Given this, the objective is to determine the acreage within the applicant-proposed compensation area that will offset the reduced carrying capacity from developing the AMS site.

To this end, CDFG proposed the following methodology for calculating compensatory acreages of each affected suitable habitat type within the proposed project area:

Biological Resources Table 6
Recommended Compensatory Habitat Acreages for Impacts to Desert Tortoise and MGS

Suitable Habitat Type	Acreage in AMS Site	Mitigation Ratio	Compensation Acreage
Undisturbed Desert Saltbush Scrub	0.6	5:1	3
Disturbed – Desert Saltbush Scrub	1.1	2:1	2.2
Disturbed - Saltbush Scrub Regrowth	226	0.5:1	113
Fallow Agricultural – Saltbush Scrub Regrowth	202.9	0:1	0
TOTAL	**430.6**	**----**	**118.2**

Source: Moore 2009

Staff and USFWS concur with these ratios. The 5:1 mitigation ratio for impacts to undisturbed desert saltbush scrub is based the proposed project's adjacency to a DWMA and desert tortoise critical habitat, as well as proximity to high concentrations of desert tortoise, known locations of MGS, and the potential for this habitat type to support several other special-status species, including rare plants and raptors. This is CDFG's standard for projects in the Hinkley area (Moore 2010) and was implemented for SEGS VII and IX (CEC 1988; CEC 1989).

The details of the project's compensatory mitigation requirements are found in staff's proposed Condition of Certification **BIO-15** (Compensatory Mitigation), which was developed in close coordination with CDFG and USFWS. Impacts to the federally and state-threatened desert tortoise and the state-threatened Mohave ground squirrel from habitat loss would be significant without mitigation; however, acquisition and enhancement of 118.2 acres of high quality suitable habitat would reduce permanent impacts to less than significant levels. Effectively, habitat compensation would also mitigate impacts to the other affected special-status mammals (i.e., American badger

and desert kit fox) as well as raptor foraging habitat because of similar habitat requirements.

To satisfy compensatory mitigation requirements, the applicant proposes to permanently protect under conservation easement a portion of 647 acres of applicant-owned land located approximately 1.25 miles west of the proposed project area (AS 2009e). Vegetation communities within the applicant-owned land include desert saltbush scrub and desert wash scrub. Approximately 414 acres along the eastern portion of this land is encumbered under a Flood Runoff Easement, which leaves 233 acres available for compensatory mitigation; 118.2 acres would be required for compensatory mitigation as described above. As illustrated in **Biological Resources Figure 1**, the proposed compensation lands are entirely located within designated desert tortoise critical habitat and MGS Conservation Area. Surveys conducted in 2008 within the one-mile buffer of an earlier iteration of the proposed project area covered the majority of the compensation lands with the exception of approximately 158 acres in the northernmost portion. No desert tortoises or sign or MGS were observed within the surveyed part of the proposed compensation area. However, a tortoise carcass and other sign were observed immediately west of the proposed compensation area and a high concentration of desert tortoise occur immediately south east of the compensation area.

Staff, CDFG, and USFWS concur that the applicant-proposed compensation land is of higher quality than the habitat that would be developed within the AMS project area and are currently reviewing the applicant's compensatory mitigation proposal as presented to CDFG and the Energy Commission via a California ESA Section 2081 Permit Application (AS 2009e). CDFG typically determines suitability of the proposed compensation lands through the Incidental Take Permit process once the Proposed Land Acquisition Form is completed; however, this process is subsumed in the Energy Commission's facility licensing process per the Warren-Alquist Act (Pub. Resources Code § 25500). The Energy Commission consults with CDFG regarding the acceptability of compensation lands and incorporates their determination into the Commission Decision. In order for CDFG to determine the acceptability of the proposed mitigation lands, staff and CDFG need to know exactly which portion of the 233 acre parcel is proposed for habitat compensation. After the location of compensation land is identified, the applicant must evaluate the degree of disturbance, dumping, historical structures, etc. that may require cleaning, fencing, repairs, demolition, etc. In addition CDFG and staff need to know if the applicant would conduct this work (if required) prior to conserving the land or if additional lands or monies will be required to off-set the aforementioned impediments.

Construction Impacts to Jurisdictional Waters

Approximately 1.59 acres of tamarisk scrub along the edge of Harper Dry Lake have been identified as potentially USACE jurisdictional waters of the U.S because they meet the three parameters required for designation as potential waters of the U.S (i.e., wetland hydrology, hydric soils, and hydrophytic vegetation). Other potentially jurisdictional waters include 9.44 acres of dry lakebed (alkali playa). Impacts to approximately 10.76 acres (1.32 acres of tamarisk + 9.44 acres of lakebed) of potential waters of the U.S would be avoided by establishing a construction exclusion zone within

which no equipment or personnel would enter and no work would be conducted. Approximately 0.27 acres would be directly impacted (i.e., removed) during construction.

The USACE has determined that all aquatic features occurring within the proposed project area are isolated and therefore not under their jurisdiction. A permit is not required for the AMS Project under Section 404 of the Clean Water Act (Estes 2010).

Construction of the proposed project, specifically the drainage channel outlet at Harper Dry Lake, would result in direct impacts (i.e., removal) to 1.47 acres of tamarisk scrub. The applicant classified tamarisk scrub as lacustrine riparian extent given its proximity to Harper Dry Lake. However, CDFG and RWQCB do not typically exert jurisdiction over monotypic stands of tamarisk scrub because it is an invasive species with little habitat value. Direct impacts to tamarisk would not require mitigation. Rather, removal of tamarisk would be considered an environmental benefit because tamarisk is an invasive species that out-competes native vegetation and alters the desert ecosystem functions and values by converting habitats into monocultures, which reduces the diversity required to support native plants and wildlife populations. To ensure effective eradication of this invasive species, monitoring and reporting over a five year period would be required consistent with CDFG 1600 authorization practices (refer to Condition of Certification **BIO-16** [Tamarisk Eradication Monitoring and Reporting Program]). Impacts to waters of the state would be less than significant and no mitigation is proposed.

General Construction Impacts

Construction activities, including noise and lighting impacts, have the potential to create a variety of temporary impacts to biological resources. In addition, construction activities could spread noxious weeds in areas adjacent to the proposed AMS site. These general construction impacts are discussed below.

Noise

Construction activities would primarily occur between 7:00 AM and 6:00 PM and would result in a short-term, temporary increase in the ambient noise level. Although sporadic, existing noise sources from traffic on Harper Lake Road and Lockhart Road and overhead military aircraft from neighboring Edwards Air Force Base, create elevated ambient noise levels to which most local wildlife species have acclimated. Excessive construction noise could disrupt the nesting, roosting, or foraging activities of sensitive wildlife. The Harper Dry Lake marsh, immediately southeast of the proposed project, is an especially sensitive noise receptor due to the presence of breeding birds. Studies have shown that noise levels over 60 A-weighted decibels (dBA) can result in nest abandonment and intense, long-lasting noise can mask bird calls which can reduce reproductive success (Dooling and Popper 2007; Hunsaker 2001). In addition, 60 dBA has been used by the USFWS and the Energy Commission as a reference point for evaluating noise impacts on wildlife (CEC 2002; CEC 2003).

During construction, the noise levels from the project area to the nearest biologically sensitive receptor, Harper Dry Lake marsh, would range from 54 dBA to 60 dBA (ESH 2009c, Table 5). However, the applicant's construction noise level analysis utilizes

averaged emission levels, and actual “noise levels at a particular location may be higher or may be lower than the tabled values on any given day and at any given time” (ESH 2009c, Table 5). Therefore, grading work on the proposed drainage channel outlet at the northeast corner of the site, which is the area of construction closest to the sensitive marsh habitat, could yield higher noise levels than the projected level of 59 dBA (ESH 2009c, Table 5) and may exceed the 60 dBA significance threshold for noise impacts to wildlife.

Pre-construction clearance surveys followed by surrounding the entire site with appropriate exclusion fencing prior to construction activities would ensure that no nesting birds or other sensitive wildlife are present onsite during construction. To minimize noise impacts to breeding birds at the marsh staff recommends Condition of Certification **BIO-10**, which requires a qualified biologist to monitor any areas expected to exceed 60 dBA during construction for nesting birds. With implementation of this condition, impacts to nesting birds from proposed project construction activities would be less than significant. For a complete analysis of construction noise impacts, refer to the **NOISE** section of this Staff Assessment.

Lighting

The majority of construction activities would occur between 7:00 AM and 6:00 PM; however, construction activities outside of these hours may be required to maintain schedule. For construction activities at night, lighting would mostly occur in the Solar Collection Assembly buildings located in the northeast corner of the Alpha site; however, some outside lighting may also be necessary. Bright lighting at night could disturb the nesting, foraging, or mating activities of wildlife and make wildlife more visible to predators. Night lighting could be especially disruptive to nocturnal animals, including desert kit fox and owls, which were observed onsite. Also, night lighting could be disorienting to migratory birds and, if placed on tall structures, may increase the likelihood of collision, as discussed under **AVIAN COLLISION AND ELECTROCUTION**.

Nocturnal mammals would be excluded from the project area prior to construction as described in staff’s proposed Condition of Certification **BIO-14**. To minimize light visible outside of the project area, Condition of Certification **BIO-7** requires the use of light shields, light direction, and low intensity lighting and requires that side-cast light not be directed at the edges of the project boundary or the Harper Dry Lake marsh, thereby avoiding sensitive wildlife habitat. Lighting impacts during construction would be temporary and with implementation of staff’s proposed Conditions of Certification **BIO-7** and **BIO-14**, impacts to wildlife from proposed project construction lighting activities would be less than significant. For a complete analysis of construction lighting impacts, refer to the **VISUAL** section of this Staff Assessment, including Condition of Certification **VIS-3**.

Spread of Noxious Weeds

The spread of noxious weeds is a major threat to biological resources in the Mojave Desert, particularly where disturbance has occurred and is ongoing. Non-native weeds frequently outcompete native plants resulting in several synergistic indirect effects: increased fire frequency by providing sufficient fuel to carry fires, especially in the inter-

shrub spaces that are mostly devoid of native vegetation (Brown and Minnich 1986; Brooks and Esque 2002) as well as decreased quality and quantity of plant foods available to desert tortoises and other herbivores and thereby affecting their nutritional intake (Hazard et al. 2002; Nagy et al.1998). The entire proposed AMS site would be permanently disturbed and graded to eliminate existing vegetation and level the site. Construction activities and soil disturbance would aid the transport and dispersal of invasive weed propagules, thereby potentially introducing new species of noxious weeds to lands adjacent to the AMS plant site and exacerbating invasions already present in the project vicinity. There are several species of noxious weeds within the proposed project area and within its immediate vicinity including Saharan mustard and split grass, two of several species that are rapidly spreading and invading the Mohave Desert (LaBerteaux 2006). Staff's proposed Condition of Certification **BIO-7** requires construction vehicles to be inspected and washed offsite within an approved area or commercial facility prior to use, monitoring and eradication of any weed invasions, and quick revegetation of temporarily disturbed areas. Implementation of this Condition would reduce potential permanent, indirect impacts from the spread of noxious weeds to less than significant levels.

Operation Impacts and Mitigation

Potential operation-related impacts include: impacts to birds due to collision with and/or electrocution by the transmission line and exhaust stacks; disturbance to wildlife due to increased noise and lighting or glare; impacts to sensitive habitats from alterations in quality or quantity of water currently reaching Harper Dry Lake; and indirect impacts to wildlife from road mortality, exposure to evaporation ponds and other pitfalls, and raven predation.

Avian Collision and Electrocution

Proposed project components that may present an electrocution and/or collision hazard to wildlife include two 72.5-foot-tall steam generator buildings, two 44-foot-tall cooling tower stacks, and 31 80-100-foot-tall transmission line support structures. Existing infrastructure proximate to the AMS site that currently presents an electrocution and/or collision hazard includes the existing SCE Kramer-Cool Water No. 1 230-kV transmission line (100-foot-tall lattice towers), LADWP Mead-Adelanto 500-kV transmission line (150-foot-tall lattice towers) and low-voltage transmission line, which run parallel and adjacent to the southern boundary of the proposed project area. The tallest existing facilities at SEGS VIII and IX adjacent to the AMS site are the cooling tower stacks, which are approximately 50 feet tall.

Collision

Bird collisions with power lines and structures generally occur when a power line or other structure transects a daily flight path used by a concentration of birds and these birds are traveling at reduced altitudes and encounter tall structures in their path (Brown 1993). Collisions typically result when the structures are invisible (e.g., bare power lines or guy wires at night), deceptive (e.g., glazing and reflective glare), or confusing (e.g., light refraction or reflection from mist) (Jaroslow 1979). Collision rates generally increase in low light conditions, during inclement weather (e.g., fog, which is rare in the desert), during strong winds, and during panic flushes when birds are startled by a disturbance or are fleeing from danger. Collisions are more probable near wetlands,

within valleys that are bisected by power lines, and within narrow passes where power lines run perpendicular to flight paths (APLIC 1996). Marsh habitat at Harper Dry Lake adjacent to the project attracts resident and migratory birds and has been known to support thousands of birds during the spring months (Cardiff 1998; BLM 2009).

It is possible that bird collisions with the AMS buildings, cooling tower stacks, transmission poles and other facilities would occur. Structures over 500 feet tall present a greater risk to migratory songbirds than shorter structures (Kerlinger 2000); bird mortality is significantly lower at towers shorter than 350 feet (Karlsson 1977; Longcore et al 2008). The tallest proposed AMS facilities are the transmission poles, which would be an average of 80 feet tall and a maximum of 100 feet tall. The solar trough mirrors would be approximately 21 feet tall.

Bird response to glare from the proposed solar trough technology is not well understood. Although the proposed AMS facilities are significantly shorter than 350 feet (the height above which is considered a collision danger for migrating birds), there is concern that the mirrors may appear to a bird as a no-hazard flight area. The mirrors reflect light and take on the color of the image being reflected (Ho et al. 2009). For example, when the mirrors reflect the sky, they can have a blue lake-like appearance, and the reflection tends to be similar to the reflection off a body of water. The reflection may also appear as clouds or terrain. Birds may fly directly into the mirrors not expecting to encounter a hard surface thereby suffering an injury or death. Staff, CDFG, and USFWS have determined that the potential for bird injury and mortality is heightened due to the proposed project's proximity to and east-facing orientation toward the Harper Dry Lake marsh, a concentration area for migratory birds.

Given the lack of research-based data on these impacts, staff cannot conclude that they are significant. However, due to potential for significant impacts, staff recommends monitoring so that if impacts do occur, they can be addressed (refer to Condition of Certification **BIO-17** [Monitoring Impacts of Solar Collection Technology on Birds]). Glare impacts with regard to potential ocular injury from beam intensity is discussed below.

Electrocution

Egrets, herons, raptors, and other large aerial perching birds, including those accorded state and/or federal protection, are susceptible to transmission line electrocution if they simultaneously contact two energized phase conductors or an energized conductor and grounded hardware. This happens most frequently when a bird attempts to perch on a transmission tower/pole with insufficient clearance between these energized elements. The majority of bird electrocutions are caused by lines that are energized at voltage levels between 1-kV and 60-kV, and "the likelihood of electrocutions occurring at voltages greater than 60-kV is low" because phase-to-phase and phase-to-ground clearances for lines greater than 60-kV are typically sufficient to prevent bird electrocution (APLIC 2006). The proposed AMS transmission lines would be 230-kV; therefore, phase-to-phase and phase-to-ground clearances are expected to be sufficient to minimize bird electrocutions.

Potential impacts to wildlife resulting from electrocution by transmission lines required for AMS project interconnection may be mitigated by incorporating the construction

design recommendations provided in *Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 2006* (APLIC 2006). Specifically, the phase conductors shall be separated by a minimum of 60 inches and bird perch diverters and/or specifically designed avian protection materials should be used to cover electrical equipment where adequate separation is not feasible (APLIC 2006). This is further described in staff's proposed Condition of Certification **BIO-7** (Impact Avoidance and Minimization Measures); implementation of Condition of Certification **BIO-7** would prevent bird mortality from electrocution.

Operation Lighting – Glare

The proposed solar mirrors and heat collection elements (HCEs) or receiver tubes are sources of bright light caused from the diffuse reflection of the sun. The first row of solar mirrors and receiver tubes would be approximately 200 meters (650 feet) west and southwest of the marsh. The solar mirrors would face east at dawn toward the Harper Dry Lake marsh and would be reflective at the marsh until approximately noon, at which time the mirrors would track the sun into a horizontal position. Glare intensity from the solar mirrors at distances beyond 100 feet would not be any different than the sun's intensity (URS 2008). The illuminated receiver tubes would be visible to an observer who is not looking directly at the mirrors axis or center, however this illumination would be much less than that of the sun (ESH 2009d). The light reflecting from the solar mirrors and the receiver tubes would not pose a significant impact to wildlife at the marsh given the distance of the marsh from the first row of solar mirrors and the absorptive properties of the receiver tubes. However, glint and glare studies of solar trough technology found that pedestrians standing within 20 meters (60 feet) of the perimeter fence when the mirrors rotate from the stowed position to a vertical position may see a light intensity equal or greater to levels considered safe for the human retina (CESF 2008; URS 2008). Staff concludes that any wildlife on the ground at a distance of 20 meters or closer could experience similar hazards from unsafe light intensity. Implementation of staff's proposed Condition of Certification **VIS-4**, which requires slatted fencing 10 feet in height be used as the perimeter fencing along the southern and eastern project boundaries, would prevent glare exposure to wildlife on the ground, thereby reducing potential impacts to less than significant levels.

Operation Noise

In consideration of existing ambient noise levels and the proposed project's operational noise, cumulative operational noise levels would not increase above existing ambient conditions, which is approximately 42 to 52 dBA (AS 2009a, Table 5.8-6). The majority of operational noise would originate from the power blocks, which would be roughly centered at each Alpha and Beta site and surrounded by solar fields; this creates a buffer for noise to attenuate before reaching the AMS property boundary and the Harper Dry Lake marsh. Other minor operational noise sources include mirror rotation and maintenance activities (e.g., mirror washing). Operational noise from the existing SEGS XIII and IV, which is anticipated to be nearly identical to the proposed project, was observed by staff during several site visits and determined to be diminutive. Staff concludes there would be no significant impacts to biological resources by increased operational noise and no mitigation is proposed. For a complete analysis of operational noise impacts, refer to the **NOISE** section of this Staff Assessment.

Operation Impacts to Desert Tortoise

Stormwater Drainage Channels

The proposed stormwater drainage channels present a serious entrapment hazard to desert tortoise and other wildlife. As described above, the main drainage Channel A would be at approximately 15 feet deep and 300 feet wide through the project area, opening to 1200 feet wide at the outlet. Any wildlife unable to fly that fell into this drainage channel would likely be injured from the fall and would be unable to escape, resulting in increased vulnerability to predation and mortality. Further, wildlife could become entangled in the gabion mattress and energy dissipation materials as well as any debris within the drainage channels. To avoid injury and mortality to wildlife, staff recommends that exclusion fencing be reinforced around the drainage channels, particularly at the headwalls, outlet, and road crossings, and monitored for breaches or disrepair (refer to Condition of Certification **BIO-11**). Implementation of staff's proposed Condition of Certification **BIO-11** would avoid and minimize impacts to desert tortoise and other wildlife by excluding them from the stormwater drainage channels within the project area.

Raven Predation

The common raven is the most highly visible predator of juvenile desert tortoises (USFWS 2008). Predation pressure by ravens is increased through elevated raven populations as a result of resource subsidies associated with human activities. Ravens are attracted to food in the form of organic garbage in trash containers, water from dust abatement and evaporation ponds, and nesting substrates on transmission line towers and other infrastructure (Boarman et al. 2006). Transmission lines and other infrastructure provide perching opportunities that enhance a raven's ability to kill tortoise, in part, by allowing them to spot slow-moving juveniles outside of the burrow. Loss of juvenile tortoise due to raven predation could have a long-term effect on the regional tortoise population by reducing the recruitment of juvenile tortoises into the adult life stages (Boarman 2003).

Decreasing the existing raven subsidies associated with agriculture would discourage ~~their~~ raven residence and proliferation at the project area, thereby reducing the risk of predation on juvenile tortoises. ~~To this end, staff's proposed~~ Staff also proposes specific Project Conditions of Certification to minimize Project-related raven subsidies. Condition of Certification **BIO-7** requires trash control and disposal offsite; **BIO-7** also requires minimal water application and monitoring to ensure water does not puddle; **BIO-18** (Common Raven Monitoring, Management, and Control) requires installation of physical deterrents to raven nesting and perching (e.g., bird spikes) on proposed AMS facilities as well as nest removal and monitoring to ensure the effectiveness of these project design features. Evaporation ponds are discussed below. These and potentially other measures to prevent raven predation as well as raven monitoring and reporting strategies will be included in a project-specific Common Raven Monitoring, Management, and Control Plan, which is currently under review by staff, USFWS, and CDFG; an approved plan must be in place prior to project construction (refer to Condition of Certification **BIO-18**). Additional measures from this final approved Plan will be included in conditions of certification or incorporated by reference, as deemed appropriate.

Long-term effects of reduced recruitment on the regional tortoise population may not be apparent for years because tortoises do not typically reach sexual maturity until approximately 15 to 20 years of age. In response, USFWS is proactively developing a comprehensive, regional raven management plan that would implement recommendations in the USFWS *Environmental Assessment to Implement a Desert Tortoise Recovery Plan Task: Reduce Common Raven Predation on the Desert Tortoise* (USFWS 2008b). To minimize the proposed project's contribution to the regional impacts on desert tortoise from raven predation, USFWS requests that the applicant submit payment to a third party account set up by the USFWS to support the regional monitoring plan (Blackford 2009). These fees would contribute to a region-wide raven management and monitoring program in the California Desert Conservation Area. However, the regional program is under development and a formal funding process has not been established (Blackford 2009). Once established, the applicant has proposed payment of approximately $50,000 toward the fund (AS 2009c); this proposal is currently being considered by staff, USFWS, and CDFG. The final agreed amount shall be consistent with the level of new raven subsidies potentially resulting from construction and operation of the project, as well as the elimination of existing raven subsidies currently in place due to long-term agriculture.

Implementation of the project-specific raven management requirements presented in **BIO-7** and **BIO-18** would reduce impacts to desert tortoise from raven predation to less-than-significant levels. In addition, payment toward the USFWS regional raven management program would offset contributions of the AMS project to cumulative impacts associated with regional increases in raven numbers.

[Rationale: The Project will remove high quality raven subsidies that currently exist as a result of agriculture. Many animals (rodents, birds, and others) injured or killed by farming operations (e.g., mowing and ground preparation) are commonly scavenged by hawks and ravens, which monitor mowing and tilling operations. Leaky irrigation pipe connections and irrigation itself also currently provide fresh drinking water for ravens. Shade trees at farm houses provide high quality nesting sites. Removal of agriculture from this area would remove significant agriculturally-based food, water, and nesting resources for ravens.]

Operation Traffic

Operation of the AMS project would generate a maximum of 250 trips per day (AS 2009a, pg. 5.13-23); thereby resulting in an increase in traffic along Harper Lake Road. Direct impacts to wildlife, including desert tortoise, are the same for operational traffic as described for construction traffic, above. Similarly, implementation of staff's proposed Condition of Certification **BIO-5**, which requires environmental awareness training for workers and staff's proposed Condition of Certification **BIO-7**, which requires adherence to posted speed limits, periodic monitoring for desert tortoise within the roadway, and checking beneath parked vehicles for tortoises or other wildlife before driving, would avoid and minimize potential impacts from operation traffic. Road kill reporting, per Condition of Certification **BIO-7**, would serve as an indicator of the effectiveness of these measures. Implementation of the impact avoidance and minimization measures in staff's proposed Conditions of Certification **BIO-5** and **BIO-7** would reduce impacts to special-status wildlife from operation traffic to less than significant levels.

Evaporation Ponds

The proposed project includes four, five-acre evaporation ponds that would collect blowdown water from the cooling towers. It is estimated that operational capacity depth would be approximately six feet with at least two feet of freeboard; side slopes would be 3:1 (horizontal: vertical) or steeper (AS 2009d).

A variety of waterfowl and shorebirds seasonally inhabit or utilize evaporation ponds as resting, foraging, and nesting areas. Evaporation ponds in the Mojave Desert pose several threats to wildlife: increased exposure to predators, salt toxicosis, and bioaccumulation of selenium and other hazardous water quality constituents. Wildlife predation on prey having accumulations of selenium and other constituents provides a trophic pathway for exposure of these wildlife species to hazardous water quality constituents in the evaporation pond. Impacts to wildlife from evaporation ponds are considered significant if they: increase mortality, reduce growth or conditions, result in reproductive impairment, cause post-hatch juvenile mortality, or cause or contribute to substantial short- or long-term reductions in species abundance (EPTC 1999).

Although effects of selenium uptake are species specific, exposure of waterfowl and shorebirds to selenium has been shown to contribute to sub-lethal effects that include, but are not limited to, changes in enzyme activity, histological abnormalities, impaired growth, and increased susceptibility to disease (EPTC 1999). In turn, these effects are likely to adversely affect species growth, survival, and reproductive success. Selenium concentrations in water over 0.005 mg/L (or 5 µg/L) in combination with invertebrates with concentrations greater than 5 parts per million (dry weight) are considered hazardous to the health and long-term survival of wildlife populations (Lemly 1996).

Water quality samples taken from wells proximate to the proposed project indicated that selenium levels in the groundwater are between 0.005 mg/L (5 µg/L) and 0.013 (13 µg/L), which is already at or in exceedance of the impact threshold; cooling water processes would concentrate selenium. However, the proposed AMS project includes a precipitation unit that captures minerals (e.g., selenium) and metals (e.g., chromium) in cooling water prior to discharging it into the evaporation ponds. This is expected to remove the majority of selenium and chromium from the wastewater stream. Conservatively assuming that no selenium is removed in the clarifier and filter processes (as the applicant has done in its Report of Waste Discharge), 0.25 mg/L (250 µg/L) would be discharged into the AMS evaporation ponds (AS 2009b), which is approximately 50 times the aforementioned impact threshold.

Salt accumulation on bird tail feathers adversely affects the bird’s ability to fly and avoid predators and also increases the weight of a bird, which increases energy expenditure for movement. Elevated salinity levels in evaporation ponds may contribute to reduced hatching success, increased juvenile mortality, and cause salt toxicosis. Salt toxicosis occurs when the bird can no longer excrete salt at levels equal to ingestion, but can be reversed if the birds ingest fresh water. Salt toxicosis in waterfowl has been reported in ponds with sodium concentration over 17,000 mg/L (USFWS 1992b; Windingstad et al. 1987). Birds spending a minimum of three hours at evaporation ponds with 52,000 to 66,000 mg/L of sodium were considered to have toxic brain sodium concentrations (USFWS 1992b). It is estimated that sodium concentrations in the AMS evaporation ponds would range from 27,996 mg/L to 35,870 mg/L (AMS 2009a, pg. 5.3-36).

In August 2007, 19 ducks died of salt toxicosis and encrustation at SEGS VIII evaporation ponds. Abnormally low water levels in the evaporation ponds caused total dissolved solids (TDS), including salt, to concentrate to lethal levels. At that time, it is likely that sodium concentrations were approximately 80,000 mg/L to 102,000 mg/L. A second mortality incident occurred in October 2007, but the cause was not determined. Both the proposed AMS and the existing SEGS VIII and XI use groundwater within the Harper Lake groundwater sub-basin for cooling. Minor differences in water quality are expected between the projects due to the use of different groundwater wells and the associated variability in groundwater quality within the basin; TDS are expected to be lower at AMS. Nonetheless, wildlife issues at SEGS VIII and XI are a good proxy for potential impacts from the AMS evaporation ponds.

Because water quality can vary markedly in the evaporation ponds depending on depth, concentration of solids, and/or contamination, evaporation ponds are hazardous to wildlife. Further, USFWS is opposed to the use of wet cooling in the desert (Blackford 2009). Dry cooling is being evaluated by staff as an alternative to wet cooling (refer to the **ALTERNATIVES** section of this Staff Assessment) and zero liquid discharge (ZLD) remains a viable wastewater disposal alternative to evaporation ponds (refer to the **SOIL & WATER RESOURCES** section of this Staff Assessment for a detailed analysis of ZLD). These alternatives would eliminate impacts from wildlife exposure to the evaporation ponds and are recommended by staff, CDFG, and USFWS. If either of these alternatives is not adopted and evaporation ponds would be constructed for the proposed project, ensuring wildlife avoidance of the evaporation pond would minimize the potential for impacts from exposure to contaminants. To this end, staff proposes Condition of Certification **BIO-19** (Evaporation Pond ~~Netting~~ Exclusion and Monitoring), which ~~requires~~ ~~includes~~ installation of ~~netting over~~ technology at the evaporation ponds to exclude birds and other wildlife as well as a monitoring program to ensure the effectiveness of exclusion technology. Adaptive management of the evaporation pond exclusion technology will be based on the monitoring data collected and analyzed on a routine basis. Implementation of this measure would reduce evaporation pond impacts to birds and other wildlife to less-than-significant levels.

[Rationale for Edits: Please see Rationale on COC BIO-19.]

Function and Value of Harper Dry Lake

Potential impacts to the wetlands at Harper Dry Lake would occur if the quality or quantity of water currently reaching the marsh is degraded or diminished; these are described below as they pertain to surface water and groundwater.

Surface Flow Quantity and Quality

The proposed stormwater drainage channel would convey offsite surface flow around the project and redirect it to its natural flow location and parameters toward Harper Dry Lake ACEC. The channel is designed to accommodate a 100-year precipitation event (AS 2009a); however, given that annual average precipitation is approximately five inches, it is not likely that the drainage channels would convey surface flows that would ultimately reach the ACEC during normal precipitation years. Rather, the limited precipitation entering the channel during normal precipitation years is anticipated to percolate into the earthen channel bottoms. In a heavy precipitation event, sheet flow

- Evaluation of the degree of disturbance, dumping, historical structures, etc. that may require cleaning, fencing, repairs, demolition, etc.; and
- Determination of whether the applicant would conduct the aforementioned work (if required) prior to conserving the land or if additional lands or monies will be required to off-set the aforementioned impediments.

- Tamarisk Eradication Monitoring and Reporting Plan
- Study Design for Monitoring Impacts of Solar Collection Technology on Birds

It is requested that these plans, survey results, and information be submitted as soon as possible to allow time for review, analysis, and incorporation into conditions of certification, as necessary, in advance of the Supplemental Staff Assessment (publication scheduled for early May 2010). Of particular importance are the draft Desert Tortoise Plan, draft Burrowing Owl Plan, Swainson's hawk and golden eagle survey results and foraging habitat assessment, and compensatory mitigation details, all of which need to be addressed by staff in the Supplemental Staff Assessment. Conditions of Certification **BIO-11** and **BIO-13**, present substantive guidance for preparation of and measures to include in the Desert Tortoise and Burrowing Owl plans, respectively. The final Desert Tortoise Plan must be submitted to USFWS with the Biological Assessment, which is currently scheduled to be submitted in March 2010; therefore a draft plan must be reviewed and comments provided as soon as possible.

Overall Conclusion

At this time, staff is able to conclude that with implementation of proposed conditions of certification, compliance with most laws, ordinances, regulations, and standards (LORS) would be achieved and most direct, indirect, and cumulative impacts would be avoided, minimized, or mitigated to less than significant levels. However, without further information/analysis/coordination staff is unable to determine whether the proposed project would be in compliance with the federal ESA and the revised BGPA. It is anticipated that all outstanding issues will be resolved and compliance with applicable LORS will be demonstrated prior to publication of the Supplemental Staff Assessment.

PROPOSED CONDITIONS OF CERTIFICATION

Staff proposes the following Conditions of Certification.

DESIGNATED BIOLOGIST SELECTION

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

The Designated Biologist must meet the following minimum qualifications:

1. Bachelor's Degree in biological sciences, zoology, botany, ecology, or a closely related field; and

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; and

3. At least one year of field experience with biological resources found in or near the project area.

4. Meet current USFWS Authorized Biologist criteria[2] and demonstrate familiarity with protocols and guidelines for the desert tortoise; and

5. Possess a recovery permit for desert tortoise and a California ESA Memorandum of Understanding pursuant to Section 2081(a) for desert tortoise and Mohave ground squirrel or have adequate experience and qualifications to obtain these authorizations. It is possible that two biologists may be utilized – each with an MOU for desert tortoise or MGS.

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

Verification: The project owner shall submit the specified information at least ~~90~~30 days prior to the start of ~~any site (or related facilities) mobilization~~ construction-related ground disturbance. The CPM, CDFG, and USFWS have 30 days to approve or deny proposed Designated Biologist(s). No site or related facility activities shall commence until an approved Designated Biologist is available to be on site.

If a Designated Biologist needs to be replaced, the specified information of the proposed replacement must be submitted to 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 approval of a short-term replacement while a permanent Designated Biologist is proposed to the CPM for consideration.

[Rationale for edits: This terminology change should be made throughout, to be consistent with the terminology used in the Compliance section of the Staff Assessment. The proposed decreased time frame is to allow sufficient time for review while allowing flexibility for project construction.]

DESIGNATED BIOLOGIST DUTIES

BIO-2 The project owner shall ensure that the Designated Biologist performs the following during any site (or related facilities) mobilization, ground

[2] USFWS designates biologists who are approved to handle tortoises as "Authorized Biologists." Such biologists have demonstrated to 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. 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.

disturbance, grading, construction, operation, and closure activities. The

Designated Biologist may be assisted by the approved Biological Monitor(s), but remains the contact for the project owner and CPM.

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. Halt any and all activities in any area when determined that there would be an unauthorized adverse impact to biological resources if the activities continued or a violation of federal or state environmental laws or a violation of any environmental agreements/conditions made between the applicant and the CPM and/or the regulatory agencies;

5. Clearly mark sensitive biological resource areas, if present and inspect these areas at appropriate intervals for compliance with regulatory terms and conditions;

6. 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 (i.e. parking lots) for animals in harm's way;

7. Notify the project owner and the CPM of any non-compliance with any biological resources condition of certification;

8. Respond directly to inquiries of the CPM regarding biological resource issues;

9. 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 Report; and

10. Train the Biological Monitors as appropriate, and ensure their familiarity with the BRMIMP, Worker Environmental Awareness Program (WEAP) training and all permits.

Verification: The Designated Biologist shall submit in the Monthly Compliance Report to the CPM copies of all written reports and summaries that document biological resource compliance activities, including those conducted by Biological Monitors.

If actions may affect biological resources during operation, a Designated Biologist or 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 are ceased as approved by the CPM. Monthly and Annual Compliance Reports shall be also be submitted to CDFG and USFWS.

BIOLOGICAL MONITOR SELECTION, QUALIFICATIONS, AND DUTIES

BIO-3 The project owner's CPM-approved Designated Biologist shall submit the resume, at least three references and contact information, of the proposed Biological Monitors to the CPM, CDFG, and USFWS for approval. The resume shall demonstrate to the satisfaction of the CPM, the appropriate education and experience to accomplish the assigned biological resource tasks, including:

- Biological Monitor(s) involved in any aspect of desert tortoise surveys or handling must meet the criteria to be considered a USFWS Authorized Biologist (USFWS 2008) and demonstrate familiarity with the most recent protocols and guidelines for the desert tortoise.
- Biological Monitor(s) involved in any aspect of Mohave ground squirrel surveys or handling must possess a California ESA Memorandum of Understanding pursuant to Section 2081(a) for Mohave ground squirrel or have adequate experience and qualifications to obtain this authorizations.

Biological Monitor(s) training by the Designated Biologist shall include familiarity with the conditions of certification and the Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP), Worker Environmental Awareness Program (WEAP), and all permits.

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

Verification: The project owner shall submit the specified information to the CPM, CDFG, and USFWS for approval at least ~~90~~30 days prior to the start of any site (or related facilities) mobilization. The CPM, CDFG, and USFWS have 30 days to approve or deny proposed Biological Monitor(s).

The Designated Biologist shall submit a written statement to the CPM confirming that the individual Biological Monitor(s) have 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 10 days prior to their first day of monitoring activities.

DESIGNATED BIOLOGIST AND BIOLOGICAL MONITOR AUTHORITY

BIO-4 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.

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, construction, and operation activities in areas specified by the Designated Biologist.

The Designated Biologist shall:

1. Halt any and all activities in any area when determined that there would be an unauthorized adverse impact to biological resources if the activities continued or a violation of federal or state environmental laws or a violation of any environmental agreements/conditions made between the applicant and the CPM and/or the regulatory agencies;

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 the CPM of any corrective actions that have been taken, or will be instituted, as a result of the work stoppage.

If the Designated Biologist is unavailable for direct consultation, the Biological Monitor shall act on behalf of the Designated Biologist. However, it is anticipated that the Designated Biologist will be onsite during construction or otherwise available by phone.

Verification: The project owner shall ensure that the Designated Biologist or Biological Monitor notifies the CPM immediately (and no later than the following morning of the incident, or Monday morning in the case of a weekend) of any non-compliance or a halt of any site mobilization, ground disturbance, grading, construction, and operation activities. The project owner shall notify 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 within five working days after receipt of notice that corrective action is completed, or the project owner will be notified by the CPM that coordination with other agencies will require additional time before a determination can be made.

WORKER ENVIRONMENTAL AWARENESS PROGRAM

BIO-5 The project owner shall develop and implement a CPM-approved Worker Environmental Awareness Program (WEAP) in which each of its employees, as well as employees of contractors and subcontractors who work on the project site or any related facilities during site mobilization, ground disturbance, grading, construction, operation, and closure are informed about sensitive biological resources associated with the project.

The WEAP must:

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 is made available to all participants;

2. Discuss the locations and types of sensitive biological resources on the project site and adjacent areas, if present;

3. Present the reasons for protecting these resources;

4. Present the meaning of various temporary and permanent habitat protection measures as necessary;

5. Discuss penalties for violation of applicable LORS (e.g., federal and state endangered species acts);

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 ~~60~~30 days prior to the start of any site (or related facilities) mobilization, the project owner shall provide to the CPM the proposed WEAP and all supporting written materials and electronic media prepared or reviewed by the Designated Biologist and a resume of the person(s) administering the program.

The project owner shall provide in the Monthly Compliance Report the number of persons who have completed the training in the prior month and a running total of all persons who have completed the training to date. At least 10 days prior to site and related facilities mobilization submit two copies of the CPM-approved materials.

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

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

BIOLOGICAL RESOURCES MITIGATION IMPLEMENTATION AND MONITORING PLAN (BRMIMP) DEVELOPMENT AND COMPLIANCE

BIO-6 The project owner shall develop a BRMIMP and submit two copies of the proposed BRMIMP to the CPM (for review and approval) and to CDFG and USFWS (for review and comment) if applicable and shall implement the measures identified in the approved BRMIMP. A copy of the BRMIMP shall be kept onsite and made readily available to biologists, regulatory agencies, the project owner, contractors, and subcontractors as needed.

The BRMIMP shall be prepared in consultation with the Designated Biologist and shall identify:

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

2. All applicant-proposed mitigation measures presented in the Application for Certification, data request responses, and workshop responses;

3. All biological resource conditions of certification identified as necessary to avoid or mitigate impacts;

4. All biological resource mitigation, monitoring, and compliance measures required in federal agency terms and conditions, such as those provided in the Biological Opinion;

5. All biological resource mitigation, monitoring, and compliance measures required in local agency permits, such as site grading and landscaping requirements;

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

7. All required mitigation measures for each sensitive biological resource;

8. A detailed description of measures that shall be taken to avoid or mitigate temporary disturbances from construction activities;

9. All locations on a map, at an approved scale, of sensitive biological resource areas subject to disturbance and areas requiring temporary protection and avoidance during construction;

10. Aerial photographs, at an approved scale, of all areas to be disturbed during project construction activities — one set prior to any site (and related facilities) mobilization disturbance and one set subsequent to completion of project construction. Include planned timing of aerial photography and a description of why times were chosen;

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

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

13. All performance standards and remedial measures to be implemented if performance standards are not met;

14. A preliminary discussion of biological resources-related facility closure measures; and

15. A process for proposing plan modifications to the CPM and appropriate agencies for review and approval.

Verification: The project owner shall provide the specified document at least ~~60~~ 30 days prior to start of any site (or related facilities) mobilization.

[Rationale for Edit: The project owner believes that the timeline may not be feasible, given all the plans that must be finalized before incorporation into the BRMIMP. The BRMIMP is a dynamic document.]

The CPM, in consultation with other appropriate agencies, will determine the BRMIMP's acceptability within forty-five (45) days of receipt. If there are any permits that have not yet been received when the BRMIMP is first submitted, these permits shall be submitted to the CPM within five (5) days of their receipt, and the BRMIMP shall be revised or supplemented to reflect the permit condition within 10 days of their receipt by the project owner. Ten days prior to site and related facilities mobilization the revised BRMIMP shall be resubmitted to the CPM. Site mobilization will not occur without an approved BRMIMP.

The project owner shall notify the CPM no less than five working days before implementing any modifications to the approved BRMIMP to obtain CPM approval.

Any changes to the approved BRMIMP must also be approved by the CPM in consultation with other appropriate agencies to ensure no conflicts exist.

Implementation of BRMIMP measures will be reported in the Monthly Compliance Reports by the Designated Biologist (i.e., survey results, construction activities that were monitored, species observed). Within thirty (30) days after completion of project construction, the project owner shall provide to the CPM, for review and approval, a written construction closure report identifying which items of the BRMIMP have been completed, a summary of all modifications to mitigation measures made during the project's site mobilization, ground disturbance, grading, and construction phases, and which mitigation and monitoring items are still outstanding.

IMPACT AVOIDANCE AND MINIMIZATION MEASURES

BIO-7 The project owner shall implement the following measures during construction and operation to manage their project site and related facilities in a manner to avoid or minimize impacts to the local biological resources:

1. Limit Disturbance Area. The boundaries of all areas to be temporarily or permanently 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 shall be stockpiled in disturbed areas, 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, 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 will do so within the planned impact area or in previously disturbed areas. Where new access is required outside of existing roads (e.g. new spur roads) or the construction zone, the route will 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 on Harper Lake Road and within fenced areas that have been cleared of tortoises; in unfenced habitat on unpaved roads, the speed limit will be 15 miles per hour ~~within the project area and secondary access roads~~.

4. Monitor During Construction. The Designated Biologist or Biological Monitor shall be present at the construction site during all project activities that have potential to disturb soil, vegetation, and wildlife. The USFWS-approved Designated Biologist or Biological Monitor shall ~~walk immediately ahead of equipment during~~ observe vegetation removal ~~and grading activities~~.

5. Minimize Impacts of Transmission/Pipeline Alignments, Roads, Staging Areas. Staging areas for construction on the plant site shall be within the area that has been fenced with desert tortoise exclusion fencing and cleared. Temporary disturbance 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) *Suggested Practices for Avian Protection on Power Lines* (APLIC 2006) and *Mitigating Bird Collisions with Power Lines* (APLIC 2004) to reduce the likelihood of bird electrocutions and collisions.

6. Avoid Use of Toxic Substances. Road surfacing and sealants as well as 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 the project boundaries and the Harper Dry Lake marsh. Lighting shall be shielded, directional, and at the lowest intensity required for activity.

8. Avoid Vehicle Impacts to Desert Tortoise. Parking and storage shall occur within 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. During construction, a Biological Monitor shall drive along project access roads, particularly Harper Lake Road at least every three hours during the desert tortoise active period (April through May and September through October) looking for desert tortoise or other vulnerable wildlife within the roadway. Outside of the active period, roads shall be monitored at least twice a day in advance of peak AM and PM traffic periods. During operation, employees shall report any desert tortoise sightings along roadways to the Biological Monitor. If a desert tortoise is observed in the roadway or beneath a parked vehicle, it will be left to move on its own~~. If it does not move within 15 minutes~~, or a Biological Monitor may remove and transfer the animal ~~to a safe location if temperatures are within the range described~~ as identified in the MSP Desert Tortoise Clearance and Relocation/Translocation Plan (Desert Tortoise Plan). The Desert Tortoise Plan addresses moving desert tortoises and associated temperature concerns in detail~~ USFWS Field Manual (www.fws.gov/ventura/speciesinfo/protocols_guidelines)~~ .

9. Avoid Wildlife Pitfalls. At the end of each work day, the Designated Biologist shall ensure that all potential wildlife pitfalls (trenches, bores, and other excavations) outside the permanently fenced area 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 tortoise-exclusion fencing. All trenches, bores, and other excavations outside the areas permanently fenced with desert tortoise exclusion fencing shall be inspected periodically throughout and 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 remove and relocate the individual to a safe location. Any wildlife encountered during the course of construction shall be allowed to leave the construction area unharmed.

10. Avoid Entrapment of Wildlife. Any construction pipe, culvert, or similar structure with a diameter greater than three inches, stored less than eight inches above ground for one or more days/nights, shall be inspected for wildlife before the material is moved, buried, or capped. As an alternative, all such structures may be capped before being stored, or placed on elevated pipe racks.

11. Report Wildlife Injury and Mortality. Report all inadvertent deaths of sensitive species to the appropriate project representative, including road kill. Species name, physical characteristics of the animal (sex, age class, length, weight), and other pertinent information shall be noted and reported in the Monthly Compliance Reports. Injured animals shall be reported to CDFG or USFWS and the CPM and the project owner shall follow instructions that are provided by CDFG or USFWS. If CDFG or USFWS cannot be immediately reached, consideration should be given to taking the animal to a veterinary hospital;

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, common ravens, and other wildlife to construction sites. A Biological Monitor shall patrol these areas to ensure water does not puddle and attract desert tortoise, common ravens, and other wildlife to the site and shall take appropriate action to reduce water application where necessary.

13. 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.

14. 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.

15. Avoid Spread of Noxious Weeds. The project owner shall implement the following Best Management Practices during construction and operation to prevent the spread and propagation of noxious weeds:

    A. Limit the size of any vegetation and/or ground disturbance to the absolute minimum and limit ingress and egress to defined routes;

    B. Reestablish vegetation quickly on disturbed sites temporarily disturbed areas, including pipelines, transmission lines, and staging areas (see **BIO-9**);

    C. Prevent spread of non-native plants via vehicular sources by implementing Trackclean™ or other methods of vehicle cleaning for vehicles coming and going from construction sites. Earth-moving equipment and construction vehicles shall be cleaned within an approved area or commercial facility prior to transport to the construction site. The number of cleaning stations shall be limited and weed control/herbicide application shall be used at the cleaning station(s);

    D. Use only weed-free straw, hay bales, and seed for erosion control and sediment barrier installations;

E. Invasive non-native species shall not be used in landscaping plans and erosion control; and

F. Monitor and rapidly implement control measures to ensure early detection and eradication of weed invasions.

16. Implement Erosion Control Measures. Standard erosion control measures shall be implemented for all phases of construction and operation. 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) with slopes toward an ephemeral drainage or Harper Dry Lake shall be stabilized to reduce erosion potential.

17. Monitor Ground Disturbing Activities Prior to Site Mobilization. If ground disturbing activities are required prior to site mobilization, 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. Actions not included in the project description are prohibited.

Verification: All mitigation measures and their implementation methods shall be included in the BRMIMP. Implementation of the measures will be reported in the Monthly Compliance Reports by the Designated Biologist. Within thirty (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. Additional copies shall be provided to CDFG and USFWS.

~~RARE PLANT PRE-CONSTRUCTION SURVEYS AND IMPACT AVOIDANCE~~

~~**BIO-8** The project owner shall conduct surveys to determine the presence or absence of desert cymopterus within the transmission interconnection site and implement the following measures to minimize impacts if desert cymopterus is detected:~~

~~1. A qualified biologist shall conduct a focused botanical survey at least 30 days prior to the start of initial ground disturbance activities, or as appropriate to capture the blooming period (March 1 to June 30) and ensure detection success.~~

~~2. If the target species is detected in the project area then the project owner shall contact Energy Commission staff to determine appropriate mitigation for impacts which may include the following:~~

~~A. Complete avoidance of rare plants through project modification.~~

~~B. Complete avoidance by flagging and mapping the population prior to construction to avoid direct impacts.~~

~~C. Relocate plants and/or collect seeds from existing populations that would be impacted and then plant/seed these plants in adjacent~~

suitable habitat that would not be affected by proposed project and then monitor for five years.

Verification: The project owner shall submit a report to the CPM, CDFG, and USFWS at least 30 days prior to the start of any project-related site disturbance activities that describes when rare plant surveys were completed, observations, mitigation measures, and the results of the mitigation.

[Rationale for Request to Remove COC BIO-8: Applicant proposes the removal of Condition of Certification BIO-8 because the location of the transmission interconnection is located within the project boundary in an area that has already been surveyed for rare plants, including desert cymopterus.]

REHABILITATION OF TEMPORARILY DISTURBED AREAS

BIO-9 For all project areas subject to temporary disturbance (e.g., the 8-acre transmission interconnection site), the following shall be implemented to restore native vegetation:

1. Stockpile Topsoil. To increase chances for revegetation success in temporary disturbed areas, topsoil shall be stockpiled from the project site for use in revegetation. Native topsoil from the least disturbed locations and only areas that are free of noxious weeds shall be used as a source of topsoil. Approximately 6-8 inches of topsoil shall be scraped from the borrow sites and stockpiled, with the top one inch from the borrow site used as top-dressing in revegetation areas. All other elements of topsoil use shall be as described in *Rehabilitation of Disturbed Lands in California* (Newton and Claassen 2003, pp. 39-40).

2. Restore Temporarily Disturbed Areas. Only seed from locally occurring species shall be used for revegetation. Seeding shall be conducted as described in Chapter 5 of *Rehabilitation of Disturbed Lands in California* (Newton and Claassen 2003). A list of plant species suitable for Mojave Desert region revegetation projects, including recommended seed treatments, are included in Appendix A-8 of the same report. The list of native plants observed during surveys of the project area can also be used as a guide to site-specific plant selection for revegetation.

3. Control Noxious Weeds. Maintain percent cover of noxious weeds (species considered “moderate” or “high” threat to California wildlands as defined by CAL-IPC [2006] and noxious weeds rated “A” or “B” by the California Department of Food and Agriculture and any federal-rated pest plants [CDFA 2009]) below current levels in rehabilitated areas.

4. Performance Standard. Native plants in the vegetation shall reach over the first 10 years of growth 80% of the initial density, absolute cover, and species richness, with progressive improvement during the 10-year period. Exotic species shall reach over the first 10 years of growth no more than four times the absolute cover of exotic plants in the original vegetation. Every effort shall be made to minimize invasion by exotic species, and the performance standards shall include a maximum allowable cover of exotic species.

~~**Verification:** All mitigation measures and their implementation methods shall be included in the BRMIMP. Implementation of the measures will be reported in the Monthly Compliance Reports by the Designated Biologist.~~

~~Within thirty (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. Additional copies shall be provided to CDFG and USFWS.~~

~~After completion of project construction and initial revegetation, the project owner shall submit an annual report to the CPM for 10 years thereafter that describes the methods and results of the long term biological monitoring of the rehabilitated areas to ensure that native vegetation is reestablishing and noxious weeds are being controlled. The report shall be submitted no later than January 31 of every year. Additional copies shall be provided to CDFG and USFWS.~~

[Rationale for Request to Remove COC BIO-9: Applicant proposes the removal of Condition of Certification BIO-9 because the location of the transmission interconnection is within the project boundary.]

PRE-CONSTRUCTION NEST SURVEYS AND IMPACT AVOIDANCE AND MINIMIZATION MEASURES FOR MIGRATORY BIRDS

BIO-10 Pre-construction nest surveys shall be conducted if construction activities will occur from February 1 through August 1. At all times of the year, noise generating activities shall be limited during early morning and evening to avoid impacts to birds protected under the Migratory Bird Treaty Act. The Designated Biologist or Biological Monitor shall perform surveys in accordance with the following guidelines:

1. Surveys shall cover all potential nesting habitat in the project site and within 500 feet of the boundaries of the plant site as well as any areas potentially exposed to noise levels above 60 dBA;

2. At least two pre-construction surveys shall be conducted, separated by a minimum 10-day interval. One of the surveys needs to 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 in any given area, an interval during which birds may establish a nesting territory and initiate egg laying and incubation;

3. If active nests are detected during the survey, a no-disturbance buffer zone (protected area surrounding the nest, the size of which is to be determined by the Designated Biologist in consultation with CDFG and USFWS) and monitoring plan shall be developed. Nest locations shall be mapped using GPS technology and submitted, along with a weekly 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 (e.g., excessive noise above 60 dBA), shall be prohibited within the buffer zone until such a determination is made.

Verification: At least 10 days prior to the start of any ground disturbing activities or construction equipment staging, 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 nests are detected during the survey, the report shall include a map or aerial photo identifying the location of the nest and shall depict the boundaries of the no-disturbance buffer zone around the nest. Additional copies shall be provided to CDFG and USFWS.

DESERT TORTOISE EXCLUSION FENCING, CLEARANCE SURVEYS, AND RELOCATION / TRANSLOCATION PLAN

BIO-11 A Desert Tortoise Exclusion Fencing, Clearance Surveys, and Relocation/Translocation Plan (Desert Tortoise Plan) shall be developed in consultation with the CPM, CDFG, and USFWS. This plan shall include detailed measures to avoid and minimize impacts to desert tortoise in and near the construction areas as well as methods for clearance surveys, fence installation, tortoise handling, artificial burrow construction, egg handling and other procedures, which shall be consistent with those described in the USFWS Desert Tortoise Field Manual (www.fws.gov/ventura/speciesinfo/protocols_guidelines) or more current guidance provided by CDFG and USFWS. At a minimum, the following measures shall be included in the plan and implemented by the project owner to manage their construction site, and related facilities, in a manner to avoid, minimize, or mitigate impacts to desert tortoise.

1. Fence Installation. Prior to ground disturbance, the entire project site shall be fenced with desert tortoise exclusion fence. To avoid impacts to desert tortoise during fence construction, the proposed fence alignment shall be flagged and the alignment surveyed within 24 hours prior to fence construction. Surveys shall be conducted by the Designated Biologist using techniques approved by the USFWS and CDFG. Biological Monitors may assist the Designated Biologist under his or her supervision. These surveys shall provide 100% coverage of all areas to be disturbed during fence construction and an additional transect along both sides of the proposed fence line. This fence line transect shall cover an area approximately 90 feet wide centered on the fence alignment. Transects shall be no greater than 30 feet apart. All desert tortoise burrows, and burrows constructed by other species that might be used by desert tortoises, shall be examined to assess occupancy of each burrow by desert tortoises and handled in accordance with USFWS-approved protocol.

    A. Timing and Supervision of Fence Installation. The exclusion fencing shall be installed prior to site clearing and grubbing. The fence

installation shall be supervised by the Designated Biologist and monitored by the Biological Monitors to ensure the safety of any tortoise present.

B. Fence Material and Installation. The permanent tortoise exclusionary fencing shall consist of galvanized hard wire cloth 1 by 2 inch mesh sunk 12 inches into the ground, and 24 inches above ground (refer to parameters for USFWS-approved tortoise exclusion fencing at www.fws.gov/ventura/speciesinfo/protocols_guidelines). For temporary exclusion fencing, a "folded bottom" technique shall be implemented. This method follows the same guidelines as installation of permanent fencing except instead of burying the bottom 12 inches of the fencing, it is bent at a approximately 90 degree angle (to follow the contour of the ground) and spikes or other retaining methods are driven into the ground every two linear feet in such a manner as to "anchor" the bottom of the fence. This method eliminates the need for trenching, which for short-term temporary impacts may be more beneficial to the recovery of the landscape, and thus the species.

C. Security Gates. Security gates shall be designed with minimal ground clearance to deter ingress by tortoises. The gates shall remain closed except during vehicle passage and may be electronically activated to open and close immediately after vehicle(s) have entered or exited to prevent extended periods with open gates, which might lead to a tortoise entering. ~~Cattle grating designed to safely exclude desert tortoise shall be installed at the gated entries to discourage tortoises from gaining entry.~~

[Rationale for Edit: Cattle grating has not been proven to be effective in discouraging tortoise movement and may create a hazard for desert tortoises. The Applicant is open to cattle grating if data can be provided by the CEC that show that it is both safe and effective for tortoises.]

~~D. Transmission Interconnection Fencing. The Transmission Interconnection Area shall be temporarily fenced with tortoise exclusion fencing to prevent desert tortoise entry during construction. Temporary fencing must follow guidelines for permanent fencing and supporting stakes shall be sufficiently spaced to maintain fence integrity. Temporary exclusion and translocation of desert tortoise in the Transmission Interconnection Area shall be addressed in the Desert Tortoise Translocation Plan.~~

[Rationale for Edit: Since the first point of transmission interconnection occurs within the Project Boundary, and therefore inside the Desert Tortoise exclusion fencing, this requirement is unnecessary.]

E. Stormwater Drainage Fencing. The onsite stormwater drainage channels, including the headwalls, outlet, and road crossings, shall be permanently fenced to ensure exclusion of desert tortoise during AMS operation.

F. Fence Inspections. Following installation of the desert tortoise exclusion fencing for both the permanent site and stormwater drainage fencing and temporary fencing in the interconnection area, the fencing shall be regularly inspected. Permanent fencing shall be inspected monthly and during/immediately following all major rainfall events. Any damage to the fencing shall be temporarily repaired immediately to keep tortoises out of the site, and permanently repaired within two days of observing damage. Inspections of permanent site fencing shall occur for the life of the project. Temporary fencing must be inspected immediately 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 utility corridor or tower site for tortoise.

2. Desert Tortoise Clearance Surveys. Following construction of the tortoise exclusionary fencing around the Plant Site, all fenced areas shall be cleared of tortoises by the Designated Biologist, who may be assisted by Biological Monitors. A minimum of two, 100% coverage protocol clearance surveys with negative results must be completed and these must coincide with heightened desert tortoise activity from April through May and September through October. Non-protocol clearance surveys may be conducted in areas of certainly unsuitable habitat (e.g., developed) with prior approval of specific areas by USFWS and CDFG (these proposed areas shall be identified in the draft Desert Tortoise Plan). To facilitate seeing the ground from different angles, the second clearance survey shall be walked at 90 degrees to the orientation of the first clearance survey, or as an alternate, offset transects can be used. Additional clearance survey guidelines provided in the USFWS *Desert Tortoise Field Manual* (www.fws.gov/ventura/speciesinfo/protocols_guidelines).

[Rationale for Edit: Offset transects are also an effective way to clear the site of tortoises by providing different angles of observation (Karl and Resource Design Technology, Inc., 2007).]

3. Translocation of Desert Tortoise. If desert tortoises are detected during clearance surveys within the project impact area, the Designated Biologist shall safely translocate the tortoise the shortest possible distance to the nearest suitable habitat as described in the Desert Tortoise Plan. If a visibly diseased tortoise is encountered onsite, procedures shall be implemented in accordance with the approved final Desert Tortoise Plan. ~~below. Any handling efforts shall be in accordance with techniques described in the USFWS *Desert Tortoise Field Manual* (www.fws.gov/ventura/speciesinfo/protocols_guidelines).~~

~~A. If a tortoise is discovered within the project site, it shall be safely translocated to the nearest desert saltbush scrub or Mojave creosote bush scrub east and south of section 33 or the nearest desert saltbush scrub west and south of section 30.~~

~~B. If a tortoise will be moved a distance greater than 5 km, disease testing and monitoring shall be conducted in accordance with the approved final Desert Tortoise Translocation Plan.~~

[Rationale for Edit: No tortoise will be moved greater than 5 km.]

C. If a visibly diseased tortoise is encountered onsite, procedures shall be implemented in accordance with the approved final Desert Tortoise Plan.

4. Burrow Inspection. All potential desert tortoise burrows within the fenced area shall be searched for presence. 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 Plan. Immediately following excavation and if environmental conditions warrant immediate translocation, tortoises excavated from burrows shall be translocated to unoccupied natural or artificial burrows within the location approved by USFWS and CDFG per the final Desert Tortoise Translocation Plan.

5. Burrow Excavation. Burrows inhabited by tortoises shall be excavated by the Designated Biologist using hand tools, and then collapsed or blocked to prevent re-occupation, in accordance with the Desert Tortoise Plan. If excavated during May through July, the Designated Biologist shall search for desert tortoise nests/eggs. All desert tortoise handling and removal, and burrow excavations, including nests, shall be conducted by the Designated Biologist in accordance with the USFWS *Desert Tortoise Field Manual* (www.fws.gov/ventura/speciesinfo/protocols_guidelines).

[Rationale for Edit: Burrow collapse during clearance may endanger tortoises and other species (e.g., badgers, kit foxes) using the burrows. The Desert Tortoise Plan has provides direction for burrow inspection and excavation.]

6. Monitoring During Clearing. Following the installation of exclusionary fencing and after ensuring desert tortoises are absent from the project site, heavy equipment shall be allowed to enter the project site to perform earth work such as clearing, grubbing, leveling, and trenching. A Biological Monitor shall be onsite at all times during initial clearing and grading activities. Should a tortoise be discovered, it shall be relocated as described above in accordance with the final Desert Tortoise ~~Translocation~~ Plan.

7. Reporting. The Designated Biologist shall record the following information for any desert tortoises handled: a) the locations (narrative and maps) and

dates of observation; b) general condition and health, including injuries, state of healing and whether desert tortoise voided their bladders; c) location moved from and location moved to (using GPS technology); d) gender, carapace length, and diagnostic markings (i.e., identification numbers or marked lateral scutes); e) ambient temperature when handled and released; and f) digital photograph of each handled desert tortoise as described in the paragraph below. Desert tortoise moved from within project areas shall be marked for future identification as described in USFWS *Desert Tortoise Field Manual* (www.fws.gov/ventura/speciesinfo/protocols_guidelines) and the Desert Tortoise Plan. Digital photographs of the carapace, plastron, and fourth costal scute shall be taken. Scutes shall not be notched for identification.

Verification: At least ~~60~~30 days prior to start of any project-related ground disturbance activities (and/or pre-construction surveys), the project owner shall provide the CPM with the final version of the Desert Tortoise ~~Translocation~~ Plan that has been approved by Energy Commission staff in consultation with USFWS and CDFG. The CPM will determine the plan's acceptability within 15 working days of receipt of the final plan. All modifications to the approved final Desert Tortoise Translocation Plan must be made only after approval by the Energy Commission staff in consultation with USFWS and CDFG. The project owner shall notify the CPM no fewer than five working days before implementing any CPM-approved modifications to the ~~Translocation~~ Desert Tortoise Plan.

Within 30 days of completing of desert tortoise clearance surveys the Designated Biologist shall submit a report to the CPM, USFWS, and CDFG describing how each of the mitigation measures described above has been satisfied. The report shall include the desert tortoise survey results, capture and release locations of any translocated desert tortoises, and any other information needed to demonstrate compliance with the measures described above.

MOHAVE GROUND SQUIRREL CLEARANCE SURVEYS

BIO-12 The project owner shall implement the following measures to manage their construction site, and related facilities, in a manner to avoid or minimize impacts to Mohave ground squirrels (MGS):

1. Clearance Survey. After the installation of the desert tortoise exclusion fence and immediately prior to any ground disturbance, the Designated Biologist(s) shall examine the construction disturbance area for MGS and their burrows. The survey shall provide 100% coverage of suitable habitat

within the project site (undisturbed desert saltbush scrub, disturbed desert saltbush scrub, disturbed desert saltbush scrub regrowth, fallow agriculture-saltbush scrub regrowth).

A. If potentially occupied burrows are identified, an attempt shall be made to trap and relocate the individual(s). Potentially occupied burrows shall be fully excavated by hand.

B. Trapping, relocation, and MGS burrow excavation shall only be conducted by individual(s) possessing an MOU with CDFG for such activities.

2. Records of Capture. If MGS are captured via trapping or burrow excavation, the Designated Biologist shall maintain a record of each Mohave ground squirrels handled, including: a) the locations (Global Positioning System [GPS] coordinates and maps) and time of capture and/or observation as well as release; b) sex; c) approximate age (adult/juvenile); d) weight; e) general condition and health, noting all visible conditions including gait and behavior, diarrhea, emaciation, salivation, hair loss, ectoparasites, and injuries; and f) ambient temperature when handled and released.

3. Relocation. Any MGS captured via trapping or burrow excavation shall be relocated to suitable habitat adjacent to the project site, which provides conditions suitable for the long-term survival of relocated MGS.

Verification: Within 30 days of completion of MGS clearance surveys, the Designated Biologist shall submit a report to the CPM and CDFG describing how the measures described above were implemented. The report shall include the MGS survey results, capture and release locations of any relocated squirrels, and any other information needed to demonstrate compliance with the measures described above.

BURROWING OWL IMPACT AVOIDANCE AND MINIMIZATION MEASURES

BIO-13 Prior to preconstruction surveys, a Burrowing Owl Monitoring and Mitigation Plan (Burrowing Owl Plan) shall be developed by the project owner in consultation with the CPM and CDFG. This plan shall include detailed measures to avoid and minimize impacts to burrowing owls in and near the construction areas (if indentified during surveys) and shall be consistent with CDFG guidance (CDFG 1995). In addition, the plan shall identify the optimal time to concurrently relocate both desert tortoise and burrowing owl. At a minimum, the following measures shall be included in the plan and implemented by the project owner to manage their construction site, and related facilities, in a manner to avoid, minimize, or mitigate impacts to breeding and foraging burrowing owls.

~~1.~~ Pre-Construction Surveys and Nest Avoidance. The Designated Biologist shall conduct pre-construction surveys for burrowing owls within the project site and a 160-foot buffer. These surveys shall be conducted concurrent with desert tortoise clearance surveys, to the maximum extent

possible. ~~The following shall be included in the Plan and implemented to avoid and minimize impacts to burrowing owls onsite:~~

~~A. Ground-disturbing actions should be carried out from September 1 to January 31, which is prior to the burrowing owl nesting season and also potentially within the desert tortoise active season, depending on ground and climate conditions.~~

~~B.~~ The pre-construction surveys will be conducted prior to the nesting season, and all burrowing owls will be passively relocated by using one-way trapdoors. Once all burrowing owls have vacated an occupied burrow, the Designated Biologist will collapse the burrow, preventing reoccupation. If ground-disturbance cannot be avoided in areas where nesting burrowing owls are active, then a~~A~~ 250-foot exclusion area around occupied burrows will be flagged and this area will not be disturbed during the nesting season (February 1 through August 31) unless a qualified biologist verifies through non-invasive methods that either: (1) the birds have not begun egg-laying and incubation; or (2) that juveniles from the occupied burrows are foraging independently and are capable of independent survival. The exclusion area shall remain connected to natural area(s) to the extent possible, to avoid completely surrounding the owl with construction activities and/or equipment.

[Rationale for edits: The proposed changes will allow flexibility in the timing of construction activities. The revised text provides a method for initiating construction outside of the nesting season, and into the nesting season, under the stipulation that all burrows would be collapsed prior to construction. The original BIO-13 requires that all ground-disturbing activity should be carried out from September 1 to January 31, which is too restrictive on the anticipated construction schedule.]

2. Artificial Burrow Installation. Prior to any ground-disturbing activities, the project owner shall install five artificial burrows for each identified burrowing owl burrow in the project area that would be destroyed, within in the approved compensatory habitat area. The Designated Biologist shall survey the site selected for artificial burrow construction to verify that such construction will not affect desert tortoise or Mohave ground squirrel or existing burrowing owl colonies in the relocation area. Installation of the artificial burrows shall occur after baseline surveys of the relocation area and prior to ground disturbance or heavy equipment staging. Design of the artificial burrows shall be consistent with CDFG guidelines (CDFG 1995) and shall be approved by the CPM in consultation with CDFG.

3. Passive Relocation. ~~Prior to passive relocation, any owls that will be relocated shall be color banded in accordance with the guidance provided by USGS bird banding lab (http://www.pwrc.usgs.gov/bbl) to monitor relocation success; this shall not be conducted during the breeding~~

~~season.~~ During the non-breeding season, owls would be given a minimum of three weeks to become familiar with the new artificial burrows, after which eviction of owls within the project site could begin. Use of one-way doors described by Trulio (1995) and Clark and Plumpton (2005) would be used to facilitate passive relocation of owls.

~~A. Monitoring and Success Criteria. The Designated Biologist shall survey the relocation area during the nesting season to assess use of the artificial burrows by owls using methods consistent with Phase II and Phase III Burrowing Owl Consortium Guideline protocols (CBOC 1993). Surveys shall start upon completion of artificial burrow construction and shall continue for a period of five years. If survey results indicate burrowing owls are not nesting on the relocation area, remedial actions shall be developed and implemented in consultation with the CPM, CDFG and USFWS to correct conditions at the site that might be preventing owls from nesting there. A report describing survey results and remedial actions taken shall be submitted to the CPM, CDFG and USFWS no later than January 31 of each year for five years.~~

[Rationale for Edits: Monitoring of the Burrowing Owl passive relocation is not necessary because of the presence of suitable Burrowing Owl habitat throughout the Project vicinity. It is not anticipated that a burrowing owl passively relocated from the Project site would necessarily find residence at the mitigation site, since there are many other areas of suitable habitat in proximity to the Project, and they are likely to disperse to suitable habitat throughout the region. Since there are so many favorable locations available for passive relocation, in addition to the proposed mitigation site, monitoring of burrowing owl passive relocation at the mitigation site would not conclusively indicate relocation success or failure.]

4. Preserve and Manage Compensatory Habitat. For each individual owl or pair identified on the project site during pre-construction surveys, 6.5 acres shall be preserved and managed in perpetuity for the occupation of burrowing owls. This compensatory habitat shall be in addition to the acreage required to mitigate impacts to desert tortoise and Mohave ground squirrel, unless it can be demonstrated that the compensation lands required to mitigate impacts to desert tortoise and Mohave ground squirrel also satisfy the criteria for mitigation of BUOW impacts.

   The compensatory habitat shall be managed for the benefit of burrowing owls, with the specific goals of:

   A. Maintaining the functionality of artificial and natural burrows; and

   B. Minimizing the occurrence of weeds (species considered “moderate” or “high” threat to California wildlands as defined by CAL-IPC [2006] and noxious weeds rated “A” or “B” by the California Department of Food and Agriculture and any federal-rated pest plants [CDFA 2009]) at less than 10% cover of the shrub and herb layers.

The Burrowing Owl Plan shall also include monitoring and maintenance requirements for the compensatory habitat, details on methods for measuring compliance goals, and remedial actions to be taken if management goals are not met.

The final Burrowing Owl Plan is due before preconstruction surveys begin to ensure that an approved relocation methodology will be followed for any owls occurring within the project area. Therefore, it is understood that the compensatory mitigation acreage (if required) will not be identified in the Burrowing Owl Plan. However, the Plan shall propose a location for compensatory mitigation land and the methodology to quantify the acreage required, as outlined above. If owls are identified during the pre-construction survey, the project owner shall submit an addendum to the Burrowing Owl Plan, which identifies the number of owls identified and the exact acreage to be preserved and managed in perpetuity for burrowing owl based on the results of the preconstruction survey and as agreed to in consultation with CDFG.

Verification: At least ~~60~~30 days prior to start of any ~~project~~construction-related ground disturbance activities ~~(and/or pre-construction surveys),~~ the project owner shall provide the CPM and CDFG with the final version of the Burrowing Owl Monitoring and Mitigation Plan that has been reviewed and approved by the CPM in consultation with CDFG. An addendum to the plan, which includes the pre-construction survey results (e.g., number of owls identified onsite) and the CDFG-approved amount of compensatory mitigation, shall be submitted within 10 days of completing the burrowing owl pre-construction surveys. The CPM will determine the acceptability of the Plan and addendum within 15 days of their receipt. All modifications to the approved Plan may be made by the CPM

after consultation with CDFG. The project owner shall notify the CPM no less than five working days before implementing any CPM-approved modifications to the Burrowing Owl Monitoring and Mitigation Plan.

AMERICAN BADGER AND DESERT KIT FOX IMPACT AVOIDANCE AND MINIMIZATION MEASURES

BIO-14 To avoid direct impacts to American badgers and desert kit fox, preconstruction surveys shall be conducted for these species concurrent with the desert tortoise surveys. Surveys shall be conducted as described below:

Biological Monitors shall perform pre-construction surveys for badger and kit fox dens in the project area, including areas within 250 feet of ~~all project facilities, utility corridors, and access roads~~ the Project Area. Surveys may be concurrent with burrowing owl, tortoise, and/or nesting bird surveys. If dens are detected, each den shall be classified as inactive, potentially active, or definitely active.

[Rationale for Edits: The utility corridor is outside the Project Area; Harper Lake Rd. is an access road.]

Inactive dens that would be directly impacted by construction activities shall be excavated by hand and backfilled to prevent reuse by badgers or kit fox.

Potentially and definitely active dens shall not be disturbed during the whelping/pupping season (February 1 – September 30). 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. 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. ~~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.~~ If tracks are observed, and especially if high or low ambient temperatures could potentially result in harm to kit fox or badger from burrow exclusion, various passive hazing methods may be used to discourage the occupants from continued use. If the Project Area has already been fenced, badgers or foxes may also be trapped in Havahart or other live traps and removed. 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.

Verification: The project owner shall submit a report to the CPM and CDFG within 30 days of completion of badger and kit fox surveys. The report shall describe survey methods, results, mitigation measures implemented, and the results of the mitigation.

COMPENSATORY MITIGATION

BIO-15 To fully mitigate for habitat loss and incidental take of desert tortoise ~~and~~ Mohave ground squirrel, and western burrowing owl, the project owner shall

acquire, prior to ground-disturbing activities, in fee or in easement, no less than 118.2 acres of land suitable for these species and shall provide funding for the enhancement and long-term management of these compensation lands. ~~This compensatory habitat shall be in addition to any acreage required to mitigate impacts to burrowing owl (refer to **BIO-13**).~~ The responsibilities for 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. If habitat disturbance exceeds that described in this analysis, the project owner shall be responsible for acquisition and management of additional compensation lands and/or additional funds required to compensate for any additional habitat disturbances. Additional funds shall be based on the adjusted market value of compensation lands at the time of construction to acquire and manage habitat. The Applicant has the option to pay an in-lieu fee, as provided for under Senate Bill 34, as an alternative to providing compensation lands as mitigation for project impacts to species covered under the California Endangered Species Act. Agreements to delegate land acquisition or management shall be implemented within 12 months of the Energy Commission's decision. The acquisition and management of compensation lands shall include, but is not limited to, the following elements:

1. Selection Criteria for Compensation Lands. The compensation lands selected for acquisition or title/easement transfer shall:

   A. have substantial capacity to support resident and dispersing desert tortoise, ~~and~~ MGS, and western burrowing owl;

   B. be a contiguous block of land (preferably) or located so that parcel(s) result in a contiguous block of protected habitat;

   C. not be encumbered by easements or uses that would preclude fencing of the site or preclude management of the site for the primary benefit of the species for which mitigation lands were secured; and

   D. include mineral/water rights or ensure that those rights may not be evoked in a manner to negate the value of the compensation lands.

2. Review and Approval of Compensation Lands Prior to Acquisition or Title/Easement Transfer. A minimum of three months prior to acquisition or transfer of the property title and/or easement, the project owner, or a third-party approved by the CPM, in consultation with CDFG and USFWS, shall submit a proposal to the CPM, CDFG, and USFWS describing the parcel(s) intended for purchase or title/easement transfer. This proposal shall discuss the suitability of the proposed parcel(s) as compensation lands for desert tortoise ~~and~~ MGS, and western burrowing owl in relation to the criteria listed above. Approval from the CPM, in consultation with USFWS and CDFG, shall be required for acquisition of all parcels

comprising no less than 118.2 acres in advance of purchase or title/easement transfer.

3. Review and Approval of Compensation Lands Management Plan. Within six months of the land or easement purchase or transfer, as determined by the date on the title, the project owner, or a third-party approved by the CPM, in consultation with CDFG and USFWS, shall submit a compensation lands management plan to the CPM, CDFG, and USFWS. The plan shall include, but not be limited to proposed measures to enhance habitat (e.g., removal of structures and other human attractants); maintenance procedures; general maintenance provisions (e.g., trash dumping, trespass, pesticide use avoidance, etc.).

4. Mitigation Security for Compensation Lands and Avoidance/Minimization Measures. The project owner shall provide financial assurances to the CPM, with copies of the document(s) to CDFG and USFWS, to guarantee that an adequate level of funding is available to implement all biological avoidance, minimization, and compensation measures described in the conditions of certification**.** These funds shall be used solely for implementation of the measures associated with the project.

   The project owner or an approved third party shall complete acquisition of the proposed compensation lands prior to initiating ground-disturbing project activities.

5. Conditions for Acquisition of Compensation Lands. The project owner shall comply with the following conditions relating to acquisition of compensation lands or transfer of the property's title and/or easement after the CPM, in consultation with CDFG and USFWS, has approved the proposed compensation lands as described above.

   A. Preliminary Report: The project owner, or approved third party, shall provide a recent preliminary title report (no more than six months old), hazardous materials survey report (i.e., Phase I ESA), biological analysis, and other necessary documents for the proposed 118.2 acres. All documents conveying or conserving compensation lands and all conditions of title/easement are subject to a field review and approval by the CPM, in consultation with CDFG and USFWS, California Department of General Services and, if applicable, the Fish and Game Commission and/or Wildlife Conservation Board.

   B. Title/Conveyance: The project owner shall transfer fee title/deed or a conservation easement for the 118.2 acres of compensation lands to CDFG under terms approved by CDFG. Alternatively, a CPM-approved, in consultation with CDFG and USFWS, non-profit organization qualified pursuant to California Government Code section 65965 may hold fee title or a conservation easement over the compensation lands. In the event an approved non-profit holds title, a conservation easement shall be recorded in favor of CDFG in a form approved by CDFG and USFWS; in the event an approved non-profit

holds a conservation easement over the compensation lands, CDFG shall be named a third party beneficiary. USFWS shall be named a third party beneficiary regardless of who holds the easement. The project owner shall also provide a property assessment and warranty.

C. Enhancement Fund. The project owner shall fund the initial protection and enhancement of the 118.2 acres by providing the enhancement fund to the CDFG. Alternatively, a CPM-approved, in consultation with CDFG and USFWS, non-profit organization qualified pursuant to California Government Code section 65965 to manage the compensation lands may hold the enhancement funds. If CDFG takes fee title to the compensation lands, the enhancement fund must go to CDFG.

D. Endowment Fund: Prior to ground-disturbing project activities, the project owner shall provide to CDFG a capital endowment in the amount determined through the Property Analysis Record (PAR) or PAR-like analysis that will be conducted for the 118.2 acres of compensation lands. Alternatively, a CPM-approved, in consultation with CDFG and USFWS, non-profit organization qualified pursuant to California Government Code section 65965 may hold the endowment fees. If CDFG takes fee title to the compensation lands, the endowment must go to CDFG, where it will likely be held in the special deposit fund established pursuant to Government Code section 16370. If the special deposit fund is not used to manage the endowment, the California Wildlife Foundation will manage the endowment for CDFG and with CDFG guidance.

   The project owner and the CPM shall ensure that an agreement is in place with the endowment holder/manager to ensure the following:

   - Interest. Interest generated from the initial capital endowment shall be available for reinvestment into the principal and for the long-term operation, management, and protection of the approved compensation lands, including reasonable administrative overhead, biological monitoring, improvements to carrying capacity, law enforcement measures, and any other action designed to protect or improve the habitat values of the compensation lands.
   - Withdrawal of Principal. The endowment principal shall not be drawn upon unless such withdrawal is deemed necessary by the CDFG or the approved third-party endowment manager to ensure the continued viability of the species on the 118.2 acres. If CDFG takes fee title to the compensation lands, monies received by CDFG pursuant to this provision will likely be deposited in a special deposit fund established pursuant to Government Code section 16370. If the special deposit fund is not used to manage the endowment, the California Wildlife Foundation will manage the endowment for CDFG and with CDFG guidance.

- Pooling Endowment Funds. CDFG, or a CPM-approved, in consultation with CDFG and USFWS, non-profit organization qualified pursuant to California Government Code section 65965 to hold endowments may pool the endowment with other endowments for the operation, management, and protection of the 118.2 acres for local populations of desert tortoise and MGS. However, for reporting purposes, the endowment fund must be tracked and reported individually.

E. Security Deposit. The project owner may proceed with ground disturbing activities before fully performing its compensatory mitigation duties and obligations as set forth above only if the project owner secures its performance by providing funding to CDFG (Security Deposit), or if CDFG approves, administrative proof of funding, necessary to cover easement costs, fencing/cleanup costs, and as necessary, initial protection and enhancement of the compensation lands. If the Security is provided to allow the commencement of project disturbance prior to completion of compensation actions, the project owner, CDFG, or a third-party entity approved by the CPM, in consultation with CDFG and USFWS, may draw on the principle sum if it is determined that the project owner has failed to comply with the conditions of certification. The security will be returned to the project owner upon completion of the legal transfer of the compensation lands to CDFG or approved third-party entity, or upon completion of an implementation agreement with a third party mitigation banking entity acceptable to the CPM and CDFG, to acquire and/or manage the compensation lands.

   The Security is calculated as follows:

   - Costs of enhancing compensation lands are estimated at $250 per acre.
   - Costs of establishing an endowment for long-term management of compensation lands are estimated at $1,350 per acre.

F. Reimbursement Fund. The project owner shall provide reimbursement to the CDFG or approved third party for reasonable expenses incurred during title, easement, and documentation review; expenses incurred from other state agency reviews; and overhead related to providing compensation lands.

The project owner is responsible for all compensation lands acquisition/easement costs, including but not limited to, title and document review costs, as well as expenses incurred from other state agency reviews and overhead related to providing compensation lands to the department or approved third party; escrow fees or costs; environmental contaminants clearance; and other site cleanup measures.

Verification: No less than 90 days prior to acquisition of the property, the project owner, or a third-party approved by the CPM, in consultation with CDFG and USFWS,

shall submit a formal acquisition proposal to the CPM, CDFG, and USFWS describing the parcel(s) intended for purchase or title/easement transfer. At least 30 days prior to ground-disturbing, project-related activities (or as allowed under 5(e), above), 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(s). Within six months of the land or easement purchase, as determined by the date on the title, the project owner shall provide the CPM with a management plan for review and approval, in consultation with CDFG, for the compensation lands and associated funds.

Within 90 days after completion of project construction, the project owner shall provide to the CPM verification that disturbance to desert tortoise and MGS habitat did not exceed 430 acres, and that construction activities did not result in impacts to desert tortoise and MGS habitat adjacent to work areas. If habitat disturbance exceeds that described in this analysis, the CPM shall notify the project owner of any additional funds

required or lands that must be purchased to compensate for any additional habitat disturbances at the adjusted market value at the time of construction to acquire and manage habitat.

TAMARISK ERADICATION, MONITORING, AND REPORTING PROGRAM

BIO-16 The project owner shall ensure effective removal of tamarisk by designing and implementing a monitoring and reporting plan. The plan shall include proposed methods for tamarisk removal and treatment, monitoring and maintenance procedures/timeline, irrigation, success standards and contingency measures, and monitoring and maintenance objectives to prevent the re-invasion of undesirable weeds and/or invasive wildlife species for a minimum of five years. The plan shall include identification on a map of each location and size of non-native vegetation to be removed, and the methods proposed to remove and dispose of invasive wildlife species. Exotic, non-native, and invasive species removal shall be conducted throughout the monitoring and maintenance period. Prior to any tree removal, lack of nesting by raptors and other native birds will be verified.

For the CPM and CDFG to deem eradication successful:

- The site shall not contain more than 5% exotic plant species for the CPM and CDFG to deem the ~~site~~ tamarisk removal successful.
- All plant species with rates of dispersal and establishment listed as "High" or "Moderate" on the California Invasive Plant Inventory shall have documented absence, or have been removed from the site for at least three years for the CPM and CDFG to deem the site successful.
- The site shall not contain invasive wildlife species for the CPM and CDFG to deem the site successful.

Monitoring and maintenance of the site shall be conducted for five years unless less monitoring can be justified. Following the first year of monitoring, if the project owner petitions to terminate the monitoring program, staff and CDFG will determine whether more years are of monitoring are needed.

Verification: At least 30 days prior to the ~~site mobilization~~ construction-related ground disturbance, the project owner shall submit to the CPM a copy of the Energy Commission staff- and CDFG-approved Tamarisk Eradication Monitoring and Reporting Plan, including success criteria.

The Designated Biologist shall submit annual reports to the CPM and CDFG describing the dates, durations and results of monitoring. The reports shall fully describe the status of the tamarisk at the eradication site, and shall describe any actions taken to remedy regrowth.

The CPM and CDFG shall 1) verify compliance with protective measures to ensure the accuracy of the project owner's mitigation, monitoring and reporting efforts; and 2) review relevant documents maintained by the project owner, interview the project

owner's employees and agents, inspect the work site, and take other actions as necessary to assess compliance with or effectiveness of protective measures.

MONITORING IMPACTS OF SOLAR COLLECTION TECHNOLOGY ON BIRDS

BIO-17 The project owner shall prepare and implement a Bird Monitoring Study to monitor the death and injury of birds from collisions with facility features such as reflective mirror-like surfaces and from heat, and bright light from concentrating sunlight. The study design shall be approved by the CPM in consultation with CDFG and USFWS, and shall be incorporated into the project's BRMIMP and implemented. The Bird Monitoring Study shall include detailed specifications on data and carcass collection protocol and a rationale justifying the proposed schedule of carcass searches. The study shall also include seasonal trials to assess bias from carcass removal by scavengers as well as searcher bias.

Verification: No more than ~~30 days following the publication of the Energy Commission Decision~~ 60 days prior to start of any construction-related ground disturbance, the project owner shall submit to the CPM, USFWS, and CDFG a draft Bird Monitoring Study. At least ~~60~~30 days prior to start of any ~~project~~construction-related ground disturbance activities, the project owner shall provide the CPM with the final version of the Bird Monitoring Plan that has been reviewed and approved by the CPM, in consultation with CDFG and USFWS. All modifications to the Bird Monitoring Study shall be made only after approval from the CPM.

For at least two years following the beginning of operation the Designated Biologist shall submit quarterly reports to the CPM, CDFG, and USFWS describing the dates, durations and results of monitoring. The quarterly reports shall provide a detailed description of any Project-related bird or wildlife deaths or injuries detected during the monitoring study or at any other time.

Following the completion of the fourth quarter of monitoring the Designated Biologist shall prepare an Annual Report that summarizes the year's data, analyzes any Project-related bird fatalities or injuries detected, and provides recommendations for future monitoring and any adaptive management actions needed. The Annual Report shall be provided to the CPM, 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 (e.g., development and/or implementation of bird deterrent technology) and/or adaptive management measures are necessary. After the Bird Monitoring Study is determined by the CPM to be complete, the project owner or contractor shall prepare a paper that describes the study design and monitoring results to be submitted to a peer-reviewed scientific journal. Proof of submittal shall be provided to the CPM within one year of concluding the monitoring study.

COMMON RAVEN MONITORING, MANAGEMENT, AND CONTROL

BIO-18 The project owner shall implement the following measures to manage their construction site and related facilities in a manner to control raven populations and to offset cumulative impacts associated with regional increases in raven numbers:

1. Common Raven Monitoring, Management, and Control Plan. The project owner shall design and implement a Common Raven Monitoring, Management, and Control Plan that is consistent with the most current USFWS-approved raven management guidelines and that meets the approval of USFWS, CDFG, and Energy Commission staff. 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. Address monitoring during construction and for the life of the project;

   E. And discuss reporting requirements.

2. USFWS Regional Raven Management. The project owner shall submit payment to a third-party account established by the USFWS to support a regional raven monitoring and management plan. The amount shall be agreed to by staff, USFWS, and the project owner, and shall be consistent with the level of new raven subsidies potentially resulting from construction and operation of the project. If raven decreases are anticipated as a result of the Project's removal of subsidies currently in place due to long-term agriculture, then this will be reflected in the in-lieu payment.

Verification: At least ~~60~~30 days prior to start of any ~~project~~construction-related ground disturbance activities, the project owner shall provide the CPM, USFWS, and CDFG with the final version of the Raven Plan that has been reviewed and approved by USFWS and CDFG. The CPM shall determine the plan's acceptability within 15 days of receipt of the final plan. All modifications to the approved Raven Plan must be made only after consultation with the Energy Commission staff, USFWS, and CDFG. The project owner shall notify the CPM no less than five working days before implementing any CPM-approved modifications to the Raven Plan.

Within 30 days after site mobilization, the project owner shall submit to the CPM verification of payment to a third-party account established by the USFWS to support a regional raven monitoring and management plan.

Within 30 days after completion of project construction, the project owner shall provide to the CPM for review and approval a 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.

EVAPORATION POND ~~NETTING~~ EXCLUSION AND MONITORING MEASURES

BIO-19 The Project owner shall ~~cover the evaporation ponds prior to any discharge with 1.5-inch mesh netting designed~~ investigate feasible and effective technologies 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,~~ technology 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.~~ The effectiveness of each technology employed shall be monitored and analyzed. An Adaptive Management program will be implemented, so that the optimal exclusion technologies are implemented. 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~~ selected technology is effective in excluding birds~~, if the nets pose an entrapment hazard to birds and wildlife, and to assess the structural integrity of the nets.~~ Surveys shall be of sufficient duration and intensity 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 ~~BSEP~~Project site shall also report finding any dead birds or other wildlife at the evaporation ponds to the Designated Biologist within one day of the detection of the carcass. The Designated Biologists shall report any bird or other wildlife deaths ~~or entanglements~~ within two 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 by or reported to the Designated Biologist, monitoring can be reduced to quarterly visits.

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 two surveys per year, during spring and fall migration.

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~~ selected technology has been installed. For the first year of operation the Designated Biologist shall submit quarterly reports to the CPM, 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~~ deaths 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, CDFG, and USFWS no later than January 31st of every year for the life of the project. All reports will compare and contrast the relative success of each of the exclusion technologies being implemented, and will provide adaptive management suggestions to optimize the overall success of avian protection at the evaporation ponds.

[Rationale for Edits: The Applicant would like the option of employing feasible and effective alternatives to netting, to minimize bird mortality and to ensure ability to comply with this COC given that no one has demonstrated the feasibility of netting a 5-acre pond used for evaporation purposes.]

Verification:

HARPER DRY LAKE MARSH WATER DELIVERY

BIO-20 To ensure continuity of water delivery to the Harper Dry Lake ACEC the project owner shall not decommission the existing well on Mojave Solar, LLC-owned property that currently serves the Harper Dry Lake marsh (wetland well) until an alternate well is able to effectively convey a minimum of 75 acre feet per year to the Harper Dry Lake marsh.

This condition of certification does not transfer to Mojave Solar, LLC the obligation of Luz Solar Partners Ltd. to allow BLM to pump 75 acre feet of water per year to the marsh, under SEGS IX Condition of Certification **BIO-11.k**.

Verification: At least 15 days prior to decommissioning the wetland well, the project owner shall provide proof, to the satisfaction of the CPM, that the alternate well is completed and able to effectively convey a minimum of 75 acre feet per year to the Harper Dry Lake marsh. Proof shall include, but not be limited to, a description of the well parameters, as constructed.

USFWS BIOLOGICAL OPINION

BIO-21 The project owner shall provide a copy of the Biological Opinion per Section 7 of the federal Endangered Species Act written by the U. S. Fish and Wildlife Service in consultation with U.S. Department of Energy. The terms and

conditions contained in the Biological Opinion shall be incorporated into the project's BRMIMP and implemented by the project owner.

Verification: For the Biological Opinion to effectively provide guidance on pre-construction actions for listed species (e.g., desert tortoise clearance surveys and translocation), the project owner shall submit to the CPM a copy of the USFWS's Biological Opinion at least ~~90~~30 days prior to the start of any ~~project~~construction-related ground disturbance activities. At this time the project owner shall also verify that the permit terms and conditions of the Biological Opinion are incorporated into the BRMIMP and will be implemented.

REFERENCES

AS 2009a. Abengoa Solar Inc./ E. Garcia (TN 52813). Application for Certification for Mojave Solar Project (09-AFC-5), dated 7/2009. Submitted to CEC on 8/10/2009.

_____2009b. Report of Waste Discharge – Mojave Solar Project. Submitted to the Lahontan Regional Water Quality Control Board on November 12, 2009.

_____ 2009c. Common Raven Monitoring, Management and Control Plan for the Mojave Solar Project. Submitted to the California Energy Commission on December 23, 2009.

_____ 2009d. Evaporation Pond Monitoring/Remediation Action Plan for the Mojave Solar Project. Submitted to the California Energy Commission on December 23, 2009.

_____ 2009e. Abengoa Mojave Solar Project; Supplemental Written Response to Data Request Set 1B (Nos. 1-86). Submitted to the California Energy Commission on December 23, 2009.

Anderson 2009. Dick Anderson, Swainson's hawk expert. Personal communication to Ruth Darling of Aspen Environmental Group. December 14, 2009.

Avery, H.W. 1997. Effects of cattle grazing on the desert tortoise, *Gopherus agassizii*: Nutritional and behavioral interactions. Pages 13-20 *in* J. Van Abbema (*ed*.), Proceedings of the International Conference on Conservation, Restoration, and Management of Tortoises and Turtles. New York Turtle and Tortoise Society, New York.

APLIC 1996. Avian Power Line Interaction Committee. 1996. Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 1996. Edison Electric Institute. Washington D.C.

_____ 2004. Mitigating Bird Collisions with Power Lines: The State of the Art in 1994. Edison Electric Institute, Washington, DC.

_____ 2006. Suggested Practices for Raptor Protection on Powerlines: The State of the Art in 2006. Edison Electric Institute, APLIC, and the California Energy Commission. Washington, D.C and Sacramento, California.

Berry et al. 1996. Berry KH, FG Hoover, and M Walker. The effects of poaching desert tortoises in the western Mojave Desert: Evaluation of landscape and local impacts. In Proceedings of the 1996 Desert Tortoise Council Symposium.

Best, T. L. 1995. *Spermophilus mohavensis*. American Society of Mammalogists, Mammalian Species 509: 1-7.

Blackford 2009. Ashleigh Blackford, Wildlife Biologist with USFWS, Ventura Office. Personal communication to Heather Blair of Aspen Environmental Group. December 3, 2009.

Boarman, W.I. 2002. Threats to desert tortoise populations: A critical review of the literature. U.S. Geological Survey, Western Ecological Research Center, Sacramento, California.

_____ 2003. Managing a Subsidized Predator Population: Reducing Common Raven Predation on Desert Tortoises. Environmental Management. V32 (2): 205-217.

Boarman, W.I., M.A. Patten, R.J. Camp, and S.J. Collis. 2006. Ecology of a population of subsidized predators: Common ravens in the central Mojave Desert, California. Journal of Arid Environments 67 (Supplement):248-261.

Boarman, W.I., and M. Sazaki. 2006. A highway's road-effect zone for desert tortoises (*Gopherus agassizii*). Journal of Arid Environments 65:94-101.

Brooks, M.L., and T.C. Esque. 2002. Alien plants and fire in desert tortoise (*Gopherus agassizii*) habitat of the Mojave and Colorado deserts. Chelonian Conservation and Biology 4:330-340.

Brown 1993. Brown, W. M. 1993. Avian collisions with utility structures: Biological perspectives. *In:* Proceedings: avian interactions with utility structures. Intern. Workshop, Miami, FL. Sponsored by APLIC and EPRI.

Brown, D.E., and R.A. Minnich. 1986. Fire and changes in creosote bush scrub of the western Sonoran Desert, California. American Midland Naturalist 116:411-422.

BLM 1982. Bureau of Land Management. Management Plan for the Harper Dry Lake Area of Critical Environmental Concern. Prepared by the Barstow Office, California Desert District Office, U.S. Department of the Interior, Bureau of Land Management. Barstow and Riverside, California.

_____ 1999a. California Desert Conservation Area Plan. 1999. Amendment of CDCA 1980.

_____ 1999b. Current Management Situation of the Special Status Species in the West Mojave Planning Area. West Mojave Planning Team. 1999. Accessed December 2009 from http://www.blm.gov/ca/st/en/fo/cdd/wemo.

_____ 2005. West Mojave Plan. 2005. Amendment to the California Desert Conservation Area Plan.

_____ 2007. Environmental Assessment for the Harper Dry Lake Area of Critical Environmental Concern Wetlands Restoration Project. Barstow Field Office. June 2007.

_____2009. Harper Dry Lake Marsh Recreation Area, Barstow Field office. Accessed October 2009 from http://www.blm.gov/ca/st/en/fo/barstow/harper.print.html

CBOC 1993. California Burrowing Owl Consortium. Burrowing Owl Survey Protocol and Mitigation Guidelines. April 1993.

CESF 2008. Carrizo Energy Solar Farm. Responses to Data Requests 1-78. Dated 2/26/2008. Submitted to CEC/B.B. Blevins/M Dyas/Dockets on 2/27/2008.

CDFG 1995. California Department of Fish and Game 1995. Staff Report on Burrowing Owl Mitigation. Sacramento, California. October 17, 1995.

_____ 2003. Mohave Ground Squirrel Survey Guidelines. Sacramento, California.

_____ 2005. California Swainson's Hawk Inventory: 2005 Progress Report. Resources Assessment Program, University of California Davis, Wildlife Health Center. Accessed December 2009 from http://www.dfg.ca.gov/rap/whc_report.html

_____ 2009. California Department of Fish and Game. 2009. California Natural Diversity Data Base (CNDDB). Search of nine 7.5-minute USGS quadrangles centered on the Elmira 7.5-minute USGS quadrangle. CNDDB's RareFind Version 3.1.

CDFA 2009. California Department of Food and Agriculture. Encycloweedia – Weeds sorted by pest rating. Accessed December 2009 from http://www.cdfa.ca.gov/phpps/ipc/weedinfo/winfo_list-pestrating.htm

CEC 1988. California Energy Commission. Final Staff Assessment for Solar Electric Generating Systems (SEGS) VIII, Harper Lake, San Bernardino County, California. December 1988.

_____1989. Final Staff Assessment for Solar Electric Generating Systems (SEGS) IX & X, Harper Lake San Bernardino, California. November 1989.

_____ 2002. Final Staff Assessment, Russell City Energy Center (01-AFC-7). June 2002.

_____ 2003. Final Staff Assessment, Salton Sea Geothermal Unit #6 Energy Project (02-AFC-2). August 2003.

_____ 2005. SEGS IX Project (89-AFC-1C) Notice of Receipt of Petition to Modify Condition of Certification Bio-11.k. Staff's Analysis for Public Review. October 13, 2005.

_____ 2007. Recommended Biological Resources Field Survey Guidelines for Large Solar Projects (Draft). May 31.

Cal-IPC 2006. California Invasive Plant Inventory. Cal-IPC Publication 2006-02. California Invasive Plant Council: Berkeley, CA

CNPS 2009. California Native Plant Society. 2009. Inventory of Rare and Endangered Plants (online edition, v7-09c). California Native Plant Society. Sacramento, CA. Accessed July 2009 from http://www.cnps.org/inventory.

CalWild (California Wilderness Coalition) 2000. Missing Linkages: Restoring Connectivity to the California Landscape. Accessed December 2009 from: http://www.calwild.org/linkages/index.html

Cardiff, Eugene A. 1988. Harper Lake bird survey data for 10 year period. Submitted to California Energy Commission July 1988.

Clark HO and DL Plumpton 2005. A Simple One-way Door Design for Passive Relocation of Western Burrowing Owls. California Fish and Game 91: 286-289.

Cowardin et al. 1979. Cowardin, L., V. Carter, F. Golet, and E. LaRoe.1979. Classification of Wetlands and Deepwater Habitats of the United States. U.S. Department of Interior. U.S. Fish and Wildlife Service. FWS/OBS-79/31. December 1979.

Dooling and Popper 2007. The Effects of Highway Noise on Birds. Prepared for the California Department of Transportation, Division of Environmental Analysis. September 30.

EDAW 2007. Harper Lake Solar Project Desert Tortoise Presence/Absence Survey, San Bernardino County, California. Dated December 2007. Attachment 7 to the Mojave Solar Project Biological Technical Report.

_____ 2009a. Mojave Solar Project Biological Technical Report. Dated May 2009.

_____ 2009b. Report Summarizing the Results of the Proposed Harper Lake Solar Project Desert Tortoise Presence/Absence Surveys. Dated January 12, 2009. Attachment 8 to the Mojave Solar Project Biological Technical Report.

_____ 2009c. Mojave Solar Project Letter Report for Spring 2009 Desert Tortoise Presence/Absence Surveys. Dated May 21, 2009. Attachment 9 to the Mojave Solar Project Biological Technical Report.

_____ 2009d. Mojave Solar Project Jurisdictional Delineation Letter Report. Dated August 26, 2009.

ESH 2009c. Ellison, Schneider and Harris/C.Ellison (TN 54243). Written Responses to Data Request Set 1 (nos. 1-93), dated 11/23/09. Submitted to California Energy Commission November 24, 2009.

_____ 2009f. Supplemental Written Responses to Data Request Set 1A (nos. 1-93), dated 12/23/09. Submitted to CEC on 12/23/2009.

Estes 2010. Stephen Estes, Project Manager with U.S. Army Corps of Engineers, Los Angeles Regulatory District. Electronic communication to Heather Blair of Aspen Environmental Group. February 26, 2010.

EPTC 1999. Evaporation Ponds Technical Committee, the San Joaquin Valley Drainage/Implementation Program and the University of California Salinity/Drainage Program. Task 4 Final Report: Technical Committee on Evaporation Ponds for San Joaquin valley Drainage Implementation Program. February.

Gehring, et. al. 2009. Communication towers, lights, and birds: successful methods of reducing the frequency of avian collisions. Ecological Applications 19(2): 505-514.

Hazard et al. 2002. Hazard, L.C., D.R. Shemanski, and K.A. Nagy. 2002. Calcium and phosphorus availability in native and exotic food plants. Proceedings Desert Tortoise Council Symposium 2001-2002:63.

Herbst DB 2006. Salinity controls on trophic interactions among invertebrates and algae of solar evaporation ponds in the Mojave Desert and relation to shorebird foraging and selenium risk. Wetlands 26(2): 475-485.

Ho et al. 2009. Ho, C.K., C.M. Ghanbari, and R.B. Diver. 2009. Hazard Analyses of Glint and Glare from Concentrating Solar Power Plants, in proceedings of SolarPACES 2009, Berlin, Germany, September 15-18, 2009.

Holland 1986. Preliminary Descriptions of the Terrestrial Natural Communities of California. Prepared for California Department of Fish and Game.

Hunsaker 2001. *The Effects Of Aircraft Operations On Passerine Reproduction*. In Proceedings of the Effects of Noise on Wildlife Conference. Institute for Environmental Monitoring and Research. August 22 to 23, 2000. pp. 41-49.

Jacobson 1992. E. Jacobson, D.V.M., Ph.D. The desert tortoise and upper respiratory tract disease. A Special Report Prepared for the Desert Tortoise Preserve Committee. Accessed January 2010 from: http://www.tortoise-tracks.org/publications/jacobson.html

Jaroslow 1979. Jaroslow, B.N. 1979. A review of factors involved in bird-tower kills, and mitigative procedures. The Mitigation Symposium: a National Workshop on Mitigating Losses of Fish and Wildlife Habitats. U.S. Forest Service General Technical Report.

Jennings WB 1997. Habitat use and food preferences of the desert tortoise, *Gopherus agassizii*, in the western Mojave and impacts of off-road vehicles. Pages 42-45 in J. Van Abbema (ed.), Proceedings of the International Conference on Conservation, Restoration, and Management of Tortoises and Turtles. New York Turtle and Tortoise Society, New York.

Karl, A.E. 2008. Letter from Alice Karl to Arrie Bachrach re: Preliminary site assessment of the Abengoa Solar facility study areas near Harper Lake, CA. Dated May 8, 2008.

Karl, A.E. and Resource Design Technology, Inc. 2007. Mesquite Regional Landfill: Initial Desert Tortoise Clearance – October 2005. Final. Submitted to Los Angeles Sanitation Districts, Whittier, CA. 70 pp.

Karlsson 1977. Bird collisions with towers and other man made constructions. Anser 16: 203-216.

Kerlinger 2000. Avian Mortality at communication towers: A review of recent literature, research, and methodology. U.S. Fish and Wildlife Service, Washington D.C.

Kochert, M.N., K. Steenhof, C.L. Mcintyre, and E.H. Craig. 2002. Golden Eagle (Aquila chrysaetos), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/bna/species/684doi:bna.684.

LaBerteaux DL 2006. Mustard removal at the Desert Tortoise Research Natural Area, Kern County, California. Report to the Desert Tortoise Preserve Committee, Inc.

Leitner, P. 2008a. Mohave Ground Squirrel Habitat Assessment, Harper Lake Solar Project, Preliminary Review. Dated May 1, 2009. Attachment 12 to the Mojave Solar Project Biological Technical Report.

_____ 2008b. Current Status of the Mohave Ground Squirrel. Transactions of the Western Section of the Wildlife Society 44:11-29

Lemly AD 1996. Assessing the Toxic Threat of Selenium to Fish and Aquatic Birds. Environmental Monitoring and Assessment. 43:19-35.

Longcore et al. 2008. Height, guy wires, and steady-burning lights increase hazard of communication towers to nocturnal migrants: A review and meta-analysis. The Auk 125(2): 485-492.

Luz (Luz Engineering). 1988. Harper Dry Lake Wetlands. Proposal to discharge SEGS VIII to Submitted to the California Energy Commission September, 1988.

_____ 2005. Harper Lake Water Agreement for Compliance with Wetland Maintenance Condition of Certification for Solar Electric Generating Stations VIII and XI at Harper Lake, California. Agreement between the California Energy Commission, Bureau of Land Management, and Luz Solar Partners LLC. Dated February 7, 2005. [Amended July 25, 2005]

Manville 2000. Manville, A.M. 2000. The ABC's of Avoiding Bird Collisions at Communication Towers: the Next Steps. Proceedings of the Avian Interactions Workshop, December 2, 1999. Charleston, SC. Electric Power Research Institute.

MWA 2008. Mojave Water Agency 2008. Well Water Pumping Records for Wells 33B02 and 28R01. Verified Extractions from the Mojave Basin Area Calendar Years 1986-90 and Water Years 2003-2004 Through 2007-2008. Accessed December 2009 at: http://www.mojavewater.org/home/watermaster/watermasterAnnualContent.aspx

Moore 2009. Tonya Moore, Senior Environmental Scientist with CDFG, Inland Desert Region. Email communication to the Energy Commission and Abengoa re: Mitigation Mojave/Harper Lake Solar 1. Dated July 29, 2009.

_____ 2010. Personal communication to Heather Blair of Aspen Environmental Group. February 3, 2010.

Nagy et al. 1998. Nagy, K.A., B.T. Henen, and D.B. Vyas. 1998. Nutritional quality of native and introduced food plants of wild desert tortoises. Journal of Herpetology 32:260-267.

NAS 2008. National Audubon Society 2008. Important Bird Areas in the U.S. Accessed December 2009 from http://iba.audubon.org/iba/profileReport.do?siteId=212&navSite=search&pagerOffset=0&page=1

Nicholson 2009. Melissa Nicholson, Preserve Manger with the Desert Tortoise Preserve Committee. Personal communication to Ruth Darling of Aspen Environmental Group. December 22 and 28, 2009.

Okin et al. 2001. Okin, G.S., B. Murray and W.H. Schlesinger. 2001. Degradation of sandy arid shrubland environments: observations, process modeling, and management implications. Journal of Arid Environments. 47(2):123-144.

Skorupa 1998. Selenium poisoning of fish and wildlife in nature: lessons from twelve real-world examples. p. 315–354. In: W. T. Frankenberger and R. A. Engberg (eds.) Environmental Chemistry of Selenium. Marcel Dekker, Inc., New York, NY.

Smith et. al 2004. Smith, G.A., Stamos, C.L., and Predmore, S.K., 2004, Regional Water Table (2002) and Water-Level Changes in the Mojave River and Morongo Ground-Water Basins, Southwestern Mojave Desert, California: U.S. Geological Survey Scientific Investigations Report 2004-5081, 10p.

Trulio LA. 1995. Passive Relocation: A Method to Preserve Burrowing Owls on Disturbed Sites. Journal of Field Ornithology 66: 99-106.

URS 2008. San Joaquin Solar 1 & 2 - Application for Certification Volume 2, Appendix L, “Glint and Glare Study,” Accessed January 2010 at http://www.energy.ca.gov/sitingcases/sjsolar/documents/applicant/afc/AFC_volume_02/.

USFWS 1992a. United States Fish and Wildlife Service. Field Survey Protocol for Any Non-Federal Action That May Occur within the Range of the Desert Tortoise.

_____ 1992b. Trace Element Concentrations in Flue Gas Desulfurization Wastewater from the Jim Bridger Power Plant, Sweetwater County, Wyoming. Prepared by Pedro Ramirez, Jr. Cheyenne, Wyoming. Accessed at: http://mountain-prairie.fws.gov/contaminants/papers/r6703c92.pdf

_____ 1994. Desert Tortoise (Mojave Population) Recovery Plan. U.S. Fish and Wildlife Service, Portland, Oregon.

_____ 2008a. Draft revised recovery plan for the Mojave population of the desert tortoise (*Gopherus agassizii*). U.S. Fish and Wildlife Service, California and Nevada Region, Sacramento, California.

_____ 2008b. Environmental Assessment to Implement a Desert Tortoise Recovery Plan Task: Reduce Common Raven Predation on the Desert Tortoise. Final Report. March 2008.

_____ 2008c. Status of the Desert Tortoise – Rangewide. Accessed January 2010 from: http://usasearch.gov/search?query=DWMA&v%3Aproject=firstgov&affiliate=fws.gov

_____ 2009. Preparing for Any Action That May Occur within the Range of the Mojave Desert Tortoise (*Gopherus agassizii*). April 2009.

USGS 2010. United States Geological Survey 2010. National Water Information System; Site Map for the Nation. Accessed January 2010 at: http://nwis.waterdata.usgs.gov/nwis/gwlevels?

Weiss 2009. Eric Weiss, Environmental Scientist with CDFG, Inland Desert Region. Personal communication to Heather Blair of Aspen Environmental Group. December 3, 17, and 28, 2009.

WRCC 2009. Western Regional Climate Center. 2009. Barstow Fire Station, California (040521). Accessed December 2009 from http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca0521

Wingdingstad et al. 1987. Wingdingstad, R.M., F.X. Kartch, R.K. Stroud, and M.R. Smith. 1987. Salt Toxicosis in Waterfowl in North Dakota. Journal of Wildlife Disease. 23(3):443-446.

CULTURAL RESOURCES

Testimony of Kathleen A. Forrest

SUMMARY OF CONCLUSIONS

Staff concludes that the Abengoa Mojave Solar (AMS) project would have ~~a significant direct impact on one historically significant historical archaeological site, referred to herein as "P-36-006553." The adoption and implementation of Condition of Certification **CUL-8** would reduce the potential impacts of the proposed project on this historical resource to less than significant~~no direct impacts on significant cultural resources.

Staff recommends that the Commission adopt the following cultural resources Conditions of Certification, **CUL-1** through **CUL-8**~~7~~. These measures are intended to facilitate the identification and assessment of inadvertent discoveries of archaeological resources during construction and to mitigate any significant impacts from the project on these resources should they be determined significant. To accomplish this, the conditions provide for the hiring of a Cultural Resources Specialist and archaeological monitors, for cultural resources awareness training for construction workers, for the archaeological and Native American monitoring of ground-disturbing activities, for the recovery of data from significant discovered archaeological deposits, for the writing of a technical archaeological report on all archaeological activities and findings, and for the curation of recovered artifacts and other data. When properly implemented and enforced, staff believes that these conditions of certification would reduce to less than significant any impacts to inadvertent discoveries during construction or operation that are determined to be significant archaeological resources. Additionally, with the adoption and implementation of these conditions, the AMS would be in conformity with all applicable laws, ordinances, regulations, and standards (LORS).

INTRODUCTION

This cultural resources assessment provides an assessment of the potential impacts of the AMS to cultural resources. Cultural resources are defined under state law as buildings, sites, structures, objects, and historic districts. Three kinds of cultural resources are considered in this assessment: prehistoric, historic, and ethnographic.

Prehistoric archaeological resources are those materials relating to prehistoric human occupation and use of an area. These resources may include sites and deposits, structures, artifacts, rock art, trails, and other traces of Native American human behavior. In California, the prehistoric period began over 12,000 years ago and extended through the eighteenth century until 1769, when the first Europeans settled in California.

Historic-period resources are those materials, archaeological and architectural, usually associated with Euro-American exploration and settlement of an area and the beginning of a written historical record. They may include archaeological deposits, sites, structures, traveled ways, artifacts, or other evidence of human activity. Under federal and state requirements, historical cultural resources must be greater than fifty years old

- For ethnographic resources, the area of analysis is expanded to take into account traditional use areas and traditional cultural properties which may be far-ranging, including views that contribute to the significance of the property. These resources are often identified in consultation with Native Americans and other ethnic groups, and issues that are raised by these groups may define the area of analysis.
- For built-environment resources, the area of analysis is confined to one parcel deep from the project site footprint in urban areas, but in rural areas is expanded to include a half-mile buffer from the project site and above-ground linear facilities to encompass resources whose setting could be adversely affected by industrial development. For this project, the area is established at that minimum.
- For a historic district or a cultural landscape, staff defines the area of analysis based on the particulars of each siting case.

For the purposes of this analysis, the project area of analysis consists of the project site, the 200-foot archaeological buffer, and the one-half mile built environment buffer. There are no linear facilities associated with the project.

Background Inventory Research

CHRIS Record Search

EDAW requested a records search at the San Bernardino County Archaeological Information Center on August 15, 2006 to identify any previous cultural resources studies and recorded historical resources within a 1-mile radius around the project area, and an additional 5-mile radius for the focus of the project's regional historic context. Within the records search area there were 15 previous studies, 30 known cultural resources and 121 isolated archaeological finds within 1-mile of the project vicinity. An updated records search was requested on April 27, 2009. New records or reports for the area had not been received since the 2006 records search (EDAW 2009a, p. 29-32).

Three previously recorded archaeological resources fall within the ~~project~~ study area of analysis: a historic refuse scatter, cement slab and wood and cement-lined well (P-36-006553); and two small historic refuse scatters (P-36-007429 and P-36-007430) (EDAW 2009a, p. 29-32).

The records search also identified eleven previously recorded architectural resources, five of which have been demolished (4) or were unable to be relocated (1). The six remaining previously recorded sites are listed in the table below.

Cultural Resources Table 3
Newly Recorded Archaeological Resources in the Project Area of Analysis

Resource Designation	Resource Type	Resource Age
P-36-020985~~MS-H-001~~	Historic/modern refuse scatter	Historic
P-36-020986~~MS-H-004~~	Historic refuse scatter with modern materials	Historic
P-36-020987~~MS-H-005~~	Two historic/modern refuse piles and sparse scatter	Historic
P-36-020988~~MS-H-011~~	Historic/modern refuse scatter	Historic
P-36-020989~~MS-H-013~~	Historic/modern refuse scatter	Historic
P-36-020990~~MS-H-017~~	Refuse pile and adjacent historic scatter	Historic
P-36-020991~~MS-H-023~~	Historic/modern refuse scatter	Historic
P-36-020992~~MS-H-024~~	Historic/modern refuse scatter	Historic
P-36-020993~~MS-H-025~~	Historic/modern refuse scatter	Historic
P-36-021096 ~~MS-H-026~~	Historic/modern refuse scatter	Historic
P-36-020994~~MS-H-207~~	Cement lined reservoir, well, pump, three cement foundations, five cement stand pipes	Historic
P-36-020995~~MS-H-210~~	Historic/modern refuse scatter	Historic
P-36-020996~~MS-H-211~~	Historic/modern refuse scatter	Historic
P-36-020997~~MS-H-214~~	Historic/modern refuse scatter	Historic
P-36-020998~~MS-H-216~~	Historic/modern refuse scatter	Historic
P-36-020999~~MS-H-217~~	Historic/modern refuse scatter	Historic
P-36-021000~~MS-H-218~~	Historic/modern refuse scatter	Historic

P-36-021001~~MS-H-221~~	Historic/modern refuse scatter	Historic
P-36-021002~~MS-M-225~~	Multi-component site: Historic/modern refuse scatter and single prehistoric obsidian flake	Prehistoric/Historic
P-36-021003~~MS-H-238~~	Historic/modern refuse scatter	Historic
P-36-021004~~MS-H-245~~	Historic/modern refuse scatter	Historic
P-36-021005~~MS-H-246~~	Historic refuse scatter, possible remnants of adjacent structure and corral	Historic
P-36-021006~~MS-P-250~~	Prehistoric lithic scatter	Prehistoric
P-36-021007~~MS-H-252~~	Historic/modern refuse scatter	Historic

Built Environment Survey

EDAW also conducted the built environment survey between May 27 and June 22, 2009 within the project area and a 0.5 mile buffer area. Previously recorded and newly identified resources were recorded on the appropriate DPR forms (EDAW 2009a, p. 36).

Because of changes to the setting of the town of Lockhart (P-36-~~006557~~006558) due to the demolition of many of the structures recorded in 1990, and the proposed demolition of the Hays Farm (P-06-006556), staff requested additional information in Data Requests 1 and 2 of Data Request Set 1 B in order to further evaluate the significance of those resources within their historic contexts and provide a justification for their significance under CRHR criteria (ESH 2009b, Attachments 1 and 2).

Eight newly recorded resources were identified in the course of the survey and are listed in the table below. Seven of the sites are modest residential sites and one is the extensive irrigation system associated with the farming activities in the project area.

Cultural Resources Table 4
Newly Recorded Architectural Resources in the Project Area of Analysis

Resource Designation	Resource Type	Resource Age
P-36-021008~~MS-B-1001~~	Residence	Historic
P-36-021009~~MS-B-1002~~	Residence	Historic
P-36-021010~~MS-B-1003~~	Irrigation system	Historic
P-36-021011~~MS-B-1004~~	Residence	Historic
P-36-021012~~MS-B-1005~~	Residence	Historic
P-36-021013~~MS-B-1006~~	Residence	Historic
P-36-021014~~MS-B-1007~~	Residence	Historic
~~MS-B-1008~~	Residence	Historic

In total, 41 resources have been identified in the project area of analysis—27 archaeological sites and 14 built environment resources. One of the archaeological resources was prehistoric and the remaining 26 were from the historic period.

Determining the Historical Significance of Cultural Resources

CEQA requires the Energy Commission, as a lead agency, to evaluate the historical significance of cultural resources by determining whether they meet several sets of specified criteria. Under CEQA, the definition of a historically significant cultural resource is that it is eligible for listing in the CRHR, and such a cultural resource is referred to as a "historical resource," which is a "resource listed in, or determined to be eligible by the State Historical Resources Commission, for listing in the CRHR", or "a

discover and record in their project-related surveys. Staff considers these prior CRHR eligibility evaluations and may accept them or conclude that additional information is needed before making its own recommendations.

When the available information on known or newly identified resources that could be impacted by the proposed project is not sufficient for staff to make a recommendation on CRHR eligibility, staff may ask an applicant to conduct additional research to gather the information needed to make such a recommendation, or staff may gather the additional information. For an archaeological resource, the additional research usually entails some degree of field excavation, called a "Phase II" investigation. For an ethnographic resource, the additional research may be an ethnographic study. For built-environment resources, the additional research would probably be archival. The object of this additional research is to obtain sufficient information to enable staff to validate or make a recommendation of CRHR eligibility for each cultural resource that the proposed project could impact.

Sixteen resources were identified within the project site that could be impacted by the project. These resources, nine archaeological sites and seven built environment resources are summarized in the table below and followed by formal staff recommendations on their eligibility for listing in the CRHR.

Cultural Resources Table 5
Cultural Resources Subject to Project Effects

Resource Designation	Resource Type	Staff Recommendation on CRHR eligibility
P-36-021006 ~~MS-P-250~~	Prehistoric lithic scatter	CRHR-ineligible
P-36-021096 ~~MS-H-026~~	Historic/modern refuse scatter	CRHR-ineligible
P-36-021005 ~~MS-H-246~~	Historic refuse scatter, possible remnants of adjacent structure and corral	CRHR-ineligible
P-36-006553	Historic refuse scatter, cement slab and wood and cement-lined well	CRHR-eligible
P-36-007429	Historic refuse scatter	CRHR-ineligible
P-36-020990 ~~MS-H-017~~	Refuse pile and adjacent historic scatter	CRHR-ineligible
P-36-020994 ~~MS-H-207~~	Cement lined reservoir, well, pump, three cement foundations, five cement stand pipes	CRHR-ineligible
P-36-021001 ~~MS-H-221~~	Historic/modern refuse scatter	CRHR-ineligible
P-36-021007 ~~MS-H-252~~	Historic/modern refuse scatter	CRHR-ineligible
P-36-006556	Farming and residential complex	CRHR-ineligible

P-36-006558	Ranching, farming, commercial and residential complex (Town of Lockhart)	CRHR-ineligible
P-36-006557	Farming and residential complex	CRHR-ineligible
P-36-021009 ~~MS-B-1002~~	Residence	CRHR-ineligible
36-021011 ~~MS-B-1004~~	Residence	CRHR-ineligible

Archaeological Resource Evaluations

Three of the identified archaeological sites (P-36-021006~~MS-P-250~~, P-36-021096~~MS-H-026~~, and P-36-021005~~MS-H-246~~) are on the project site and were proposed by EDAW as potentially significant. Staff requested that a field investigation be designed to determine if subsurface deposits were present and, if so, to acquire sufficient data to make recommendations of eligibility for these sites and to provide the appropriate DPR forms (CEC 2009n, p.5). The Phase II research design included reexamination of the surface of the site, excavation of shovel test pits (STPs) at each of the sites and, depending on the results of the STPs, the excavation of 1-meter by 1-meter pits at the sites. All of the excavated material was screened through 1/8 inch mesh hardware cloth. Fieldwork was conducted in December of 2009 to determine if intact deposits were present and, if so, to determine the extent, age, affiliation, and eligibility of those deposits (ESH 201 0a, p. 1).

~~*MS-P-250*~~*P-36-021006*

P-36-021006~~MS-P-250~~ is a sparse prehistoric lithic scatter consisting of four cryptocrystalline silicate flakes adjacent to the dry lake shoreline in the northeast corner of the project site, north of the Alpha Solar Field (East). The surrounding vegetation consists of marsh grasses and adjacent salt brush. Three of the pieces are complete flakes and one is a flake fragment. Two of the flakes appeared to originate from rodent burrow backdirt piles which could be indicative of a subsurface deposit (EDAW 2009a, p. 63). Potential for a subsurface deposit was assumed based on the location of the scatter, adjacent to the dry lake bed.

The Phase II investigation placed four STPs throughout the site and reexamined the surface of the site. STPs were excavated to a depth of 80 centimeters below the present surface, the deepest extent possible. Soils were noted to be non-organic, sandy, silty alluvium. None of the STPs revealed any cultural materials, and further testing was not pursued (ESH 201 0a, p. 3-4). Additionally the geoarchaeology study also excavated test trenches in the northeastern corner of the project site, to an average depth of 1.7 meters. The results of the geoarchaeology testing, discussed fully in the "Field Inventory Investigation" subsection above, noted that, while the geoarchaeological testing did not record any cultural deposits, the presence of lacustrine deposits in this area of the project site have the potential to contain subsurface archaeological deposits (SWCA 2009c, p. 29).

The site does not qualify under CRHR Criteria 1, 2 or 3. Based on the results of the Phase II archaeological testing, staff recommends that P-36-021006~~MS-P-250~~ does not meet the criteria for listing on the CRHR under Criteria 4, as there is no evidence of a subsurface deposit and the site does not have the potential to yield information important to history or prehistory.

P-36-021096~~*MS-H-026*~~

P-36-021096~~MS-H-026~~ is a cluster of extensive historic and modern refuse dumps and an associated scatter, situated along the southern side of Lockhart Road and western side of Lockhart Ranch Road, and the southwestern boundary of the Alpha Solar Field (West), within the project buffer. P-36-021096~~MS-H-026~~ is located directly across Lockhart Road from a historic farmstead site, and may be associated with it.

Seven concentrations were noted in the site, with a less dense scatter surrounding them. Due to the large amount of material present, during the initial field investigation a one-meter-by-onemeter area of each concentration was inventoried to obtain a representative sample of the contents of the site. The majority of items inventoried were cans and bottles, including those associated with food, beverage, condensed milk, coffee, fuel, cleansers and soap. Also present were building and construction materials and automotive items. Items noted outside of the sample areas included butchered animal bones, kitchen ware, a motorcycle seat, furniture parts and other domestic items. The survey notes that a comparatively larger proportion of the materials located in this site are modern than in other nearby refuse sites. Also noted was that some of the concentrations show evidence of burning, which is indicative of purposeful dumping and trash elimination. The possibility of significant quantities of older materials warranted further investigation (EDAW 2009a, p. 54-55).

As part of the Phase II investigation, four STPs at 10 meter intervals were excavated to a depth of 30 centimeters. Soils were noted to be non-organic, sandy, silty alluvium. None of the STPs revealed any cultural materials, and further testing was not pursued (ESH 201 0a, p. 6-7). The site was initially assumed to extend into the project site; however, the Phase II testing took place within the project site and did not discover any subsurface cultural materials north of Lockhart Road or east of Lockhart Ranch Road. Should cultural materials be discovered within the project site, they would not contribute to the significance of the site, if it were ever determined to be significant. The portion of the site within the project site does not appear to be significant under any of the CRHR criteria, and therefore staff recommends that the resource is not eligible for listing on the CRHR.

P-36-021005~~***MS-H-246***~~

The initial site record described P-36-021005~~MS-H-246~~ as a dense historic refuse dump and the remnants of a possible adjacent wooden structure and corral located at the northeast section of the project site, adjacent to the dry lake shoreline and north of the Alpha Solar Field (East). The site contains several in-situ posts and milled wooden structural debris. The refuse dump may have begun as a pit, and shows evidence of burning. Historic materials in the dump include domestic refuse such as beverage cans; sanitary food and condensed milk cans; crockery shards; and a variety of bottles and jars including soda, liquor, ketchup and bleach. The deposit does not contain any clearly modern materials, suggesting it was not in use after the 1950s. The posts may represent the remains of a livestock coral, and the posts and milled wooden debris on the west side appear to be the remains of a shed or small residence. The refuse dump has been disturbed by bottle hunters, erosion, past farming activity, and use for target practice (EDAW 2009a, p. 61).

As part of the Phase II investigation, four STPs were placed within the area of the possible structure, ranging from 35 to 80 centimeters in depth, and the surface of the site was further examined. The STPs did not indicate the presence of subsurface features such as walls or a foundation. Four additional STPs were placed within the refuse area ranging in depth from 30 to 50 centimeters, and did not indicate the presence of subsurface deposits extending horizontally beyond the visible surface extent (ESH 201 0j, p. 36).

Additionally, a one-meter-by-one-meter test pit was excavated into the dump deposit. The pit revealed a dense deposit of refuse extending to a depth of approximately 40 centimeters. The majority of items recovered were building materials and consumer goods, including a variety of tin cans (fragments), glass bottles (fragments), crockery shards, automotive parts, domesticated animal bone and pieces of iron. The site may also have been used as a butchering site for domesticated animals, as evidenced by the bone found on site, and the in situ posts may indicate a holding pen or chute used for the animals (ESH 201 0j, p. 39-40).

The Phase II investigation concluded that the site was likely a discrete dump site for household and commercial goods, used by a small number of people over a prolonged period of time, rather than a communal dump site. The site may have also been used as a butchering site for cattle or other animals as evidenced by the butchered bone on the site, and the structural remains may represent a holding pen or chute. The maker's marks of the bottles found were analyzed to provide information on the potential dates of use, and it appears likely that the dump was in use between the 1940s and the 1960s (ESH 201 0j, p. 57-58).

The entire site showed evidence of significant disturbance, including several pits created by looters (ESH 201 0a, p. 7-8). The site does not qualify for the CRHR under Criteria 1, 2 or 3. Based on the archival information, Phase II investigation that did not reveal an association for the site, and the extensive disturbance of the site, the site does not appear to be significant under any of the CRHR criteria, and therefore staff recommends that the resource is not eligible for listing on the CRHR.

P-36-006553

~~P-36-006553 was also identified as a resource potentially subject to project impacts. It is a sparse historic refuse scatter that was re-visited as part of the project survey. It is on the northeastern portion of the project site along the northern boundary of the Beta Solar Field, partially located in the project site and extending approximately 150 feet north towards the dry lakebed. In addition to the sparse historic refuse scatter, the site consists of a large cement slab and a contiguous wood and cement-lined well. An additional concrete foundation is located at the north end of the site, beyond the project boundary. The refuse scatter consists of sanitary food cans, church key-opened beverage cans, white ware crockery shards, a ceramic coffee cup fragment, aqua glass shards, and red brick fragments. The research notes that this site could be associated with habitation on the site between 1922 and 1939, and the potential for significant information to be acquired from the site, both archival and archaeological, exists (EDAW 2009z, p. 45-47).~~

~~The applicant was requested in Data Request 1 B, Data Requests 8-13, to more accurately locate the site in relation to the project site, to identify any impacts, and, if impacts could not be avoided, provide a plan for a field investigation of the site to determine the presence of subsurface deposits and acquire enough information to make a recommendation of eligibility for the CRHR (CEC 2009n, p. 2-4). The site was determined to extend 13 meters into the project site. The applicant requested additional time to complete the research in their letter of November 18, 2009, indicating that it would be included in the Phase II investigation (ESH 2009b, p.1). The applicant has not yet had the opportunity to complete the investigation. As a result, staff is making an~~

~~assumption that the resource is eligible for listing in the CRHR under Criterion 4 and will carry this assumption through the balance of the analysis. Condition CUL-8 mitigates the direct physical impact to the site.~~

P-36-007429

P-36-007429 is a previously recorded sparse historic refuse scatter on the project site in the southwestern corner of the proposed Beta Solar Field. It consists of twelve refuse items. Historic refuse items include sun-colored amethyst glass shards; aqua glass shards; hole-in-cap cans; and knife-opened cans. Modern materials include a metal round bar; milled wood; pieces of wooden crate(s); concrete block; and a metal band. The site has been disturbed by farming activities and has likely been used for target practice (EDAW 2009a, p. 47). Staff recommends, due to the disturbance of the site and the lack of association that the site does not appear to be significant under any of the CRHR criteria, and therefore staff recommends that the resource is not eligible for listing on the CRHR.

~~MS-H-017~~P-36-020990

~~MS-H-017~~P-36-020990 is a small refuse pile located in the proposed 50-foot wide drainage area at the northeastern corner of the Alpha Solar Field (West), west of Harper Lake Road. All items in the refuse pile are church-key opened beverage cans. The site has been disturbed by farming activities and has likely been used for target practice (EDAW 2009a, p. 51). The site does not appear to be significant under any of the CRHR criteria, and therefore staff recommends that the resource is not eligible for listing on the CRHR.

P-36-020994~~MS-H-207~~

P-36-020994~~MS-H-207~~ is a cement-lined reservoir and attendant facility structures located at the northwestern corner of Alpha Solar Field (East). Extending north from the project site, it consists of a well, pump, three cement slabs/foundations and five cement stand pipes. The eastern wall of the reservoir has been removed and two large piles of rubble are south of the reservoir, possible the remains of the eastern wall and former structures. The associated refuse scatter consists of crockery, nails, metal and concrete pieces, glass vessel shards, sanitary food and beverage cans, bottles and jars (EDAW 2009a, p. 56). The demolition of the east wall of the reservoir and associated structures has compromised the integrity of the site. The site does not appear to be significant under any of the CRHR criteria, and therefore staff recommends that the resource is not eligible for listing on the CRHR.

P-36-021001~~MS-H-221~~

P-36-021001~~MS-H-221~~ is located on the western boundary of the Beta Solar Field, south of Lockhart Road. Two concentrations of historic refuse scatter were identified, consisting of church- key opened beverage cans, sanitary food cans, condensed milk cans, and crockery fragments. Also present are sheet metal, butchered bone, round wire, cut nails, coffee cans, milled lumber fragments, window glass, combustion engine parts, and various other items of unknown age. The site has been extensively disturbed by agricultural activities and has also likely been used for target practice (EDAW 2009a, p. 59). The site does not appear to be significant under any of the CRHR criteria, and therefore staff recommends that the resource is not eligible for listing on the CRHR.

P-36-021007~~MS-H-252~~

P-36-021007~~MS-H-252~~ is located on the southern edge of Beta Solar Field and continues south of the project site. It is a historic refuse scatter consisting of sanitary food cans, pocket tobacco tins, lard buckets, and a baking powder can lid. Items of unknown age include pieces of an alarm clock, wooden crates, sheet metal, a galvanized bucket and a metal thermos casing. The site has been extensively disturbed by agricultural activities and has also likely been used for target practice (EDAW 2009a, p. 63). The site does not appear to be significant under any of the CRHR criteria, and therefore staff recommends that the resource is not eligible for listing on the CRHR.

Built-Environment Resources Evaluations

Five built environment resources were identified within the project site that would be impacted by the project.

Hays Farm (P-36-006556)

The Hays Farm, P-36-006556, was initially identified by EDAW as potentially eligible for the CRHR under Criteria 1 and 4. Located on the project site at the eastern side of the Alpha Solar Field (East), the site was previously recorded as a homestead complex, and consists of a ca. 1950s one-story residence; a two-story unfinished garage; two outbuildings; animal pens; a large reservoir; and the remains of an irrigation system. It is the site of the Spenker homestead, the first homestead in the west Harper Lake area (EDAW 2009a, p. 69-70).

Following the initial eligibility recommendation, staff requested in Data Request Set 1 B, Data Requests 1, 3, 4, 5, and 6, that additional information be provided clarifying how the resource was or was not eligible and also that the site be investigated for its historical archaeological potential (CEC 2009n, p. 2-4). The additional investigation concluded that while the site retained significance for its association with the Spenkers, none of the buildings original to that period survive and therefore the site does not retain sufficient integrity to be eligible. The historical archaeological investigation, which consisted of a review of archival information including the previous surveys, historic maps and photographic collections, as well as the current field survey, concluded that there was a low potential for historic archaeological deposits (ESH 2009d, Attachment 3, p. 2). The site does not appear to be significant under any of the CRHR criteria, and therefore staff recommends that the resource is not eligible for listing on the CRHR.

Lockhart General Merchandise Store

The Lockhart General Merchandise Store, a component of the community of Lockhart (P-36-006558), was also initially identified by EDAW as eligible for the CRHR under Criteria 1. There were originally 41 buildings and structures recorded on the Lockhart site, which was described as the central complex of the Lockhart and Most ranches. Those buildings included residential buildings, a water tower, reservoirs, hay sheds, the General Merchandise Store, miscellaneous farm buildings, garages and an airplane hangar. Largely intact when it was recorded in 1990, the site encompassed four broad historical periods: the Davis/Weatherill homesteads c. 1922-1930; the Evans Ranch c.1930-1940; the Lockhart Ranch c. 1940-1962; and the Orita Land and Cattle/Most Ranch c. 1962-1990. The site was one of the earliest locations of permanent occupancy

within the Harper Valley study area, and the Davis house was still standing in 1990. When the site was recorded, the town of Lockhart retained architectural integrity and spanned the period of 1919 through the early 1950s, representing the development of the Harper Valley community and the origin of the town of Lockhart (EDAW 2009a, p. 72).

The majority of the structures standing in 1990 have since been demolished, with only the concrete foundations remaining. The General Merchandise store is the only remaining building that appears to represent an association with the period. Following the initial consultant eligibility recommendation, staff requested in Data Request Set 1 B, Data Requests 2-6, that additional information be provided clarifying how the resource was or was not eligible and also that the site be investigated for its historic archaeological potential (CEC 2009n, p. 2-4).

The archaeological investigation, which consisted of a review of archival information including the previous surveys, historic maps and photographic collections, as well as the current field survey, concluded that there was a low potential for historic archaeological deposits.

Upon further evaluation, the Lockhart General Merchandise Store was described as having been

> *"The iconic building was once the center of a vibrant desert community and it remains one of the largest buildings in the valley... During the 1950s, movies were projected onto the west wall, and the building served as a centerpiece for the community. Attracting visitors from the region and beyond, it has historically been a major landmark in the desert and for the desert community..."* (ESA 2009d, Attachment 2, p. 4)

However, it is noted in a discussion of the social life of the community in the 1990 Cultural Resources survey that while the General Merchandise Store put the town of Lockhart on the map,

> *"At the end of the day, however, the community reverted back to a small settlement of some 200 people, most of whom were Lockhart employees and their families. It was at that time that the general store became just another big building. Throughout the 1950s, it never replaced the cook shack as the nerve center of the community... people sometimes watched outdoor movies projected onto the west wall of the general store—in the 1950s, there were no back additions to the building as there are today"* (~~Hampton~~ Hampson and Swanson, 1990, p. 22).

The cook shack was a frame structure that had an industrial gas grill, a walk-in refrigerator and three long wooden tables with benches, and also served as the commissary until the General Merchandise Store opened. It remained operational for several years after the opening of the General Merchandise Store, although it eventually closed and collapsed sometime in the 1960s. The remains were carted off-site (~~Hampton~~ Hampson and Swanson, 1990, p. 21). This account, based on interviews with some of

the remaining residents at the time, diminishes the importance of the General Merchandise Store to the community of Lockhart, and also notes that the rear of the building—where movies were shown—has been altered.

Additionally, the majority of the architectural remains of the community of Lockhart are no longer extant, having been demolished since the site was originally recorded in 1990 (EDAW 2009a, p. 73). The building is noted as being the centerpiece of the community, however the community—both people and buildings—are gone. As a result, the integrity of setting, feeling and association of the site has been has been significantly compromised. Staff recommends that the General Merchandise Store is not eligible for the CRHR, due to the loss of integrity to the setting, feeling and association as a result of the demolition of the majority of structures on the site.

P-36-006557

When recorded in 1990 P-36-006557 was an intact homestead site with several structures, including a residence, two outbuildings, a fountain/pool, a well, and the remains of an irrigation system. The site is located in the southwestern corner of the Alpha Solar Field. The property was established by James M. Maclachlan in ca. 1918, one of the first homesteaders in the area. The property eventually became part of the Most ranch. The current survey documented the buildings in ruins (EDAW 2009a, p. 71). The site does not appear to be significant under any of the CRHR criteria, and therefore staff recommends that the resource is not eligible for listing on the CRHR.

P-36-021009~~MS-B-1002~~

P-36-021009~~MS-B-1002~~ is located on Lockhart Road at the northwestern corner of the Beta Solar Field, immediately south of the Alpha Solar Field (East). The site includes two residential buildings, a storage structure, well and large standpipe. The residential structures were originally mirror images of each other, but have been altered over time. The construction date of the buildings is unknown, however they are likely associated with the Lockhart/Most ranch and may have housed employees. While associated with the Lockhart ranch and the Harper Lake community, the site does not retain a significant level of association with an event or historical figure. Although they do exhibit Minimal Traditional-style characteristics, the buildings are not distinctive examples of a type or period (EDAW 2009a, p. 77-80). The site does not appear to be significant under any of the CRHR criteria, and therefore staff recommends that the resource is not eligible for listing on the CRHR.

P-36-021011~~MS-B-1004~~

MS-B-1004 is a concrete block structure located at the southern edge of the Beta Solar Field, adjacent to a transmission line. The building does not retain a roof, doors, windows or finished walls. It may have been associated with the Lockhart Ranch, but does not retain sufficient integrity to convey any association or significance (EDAW 2009a, p. 82). The site does not appear to be significant under any of the CRHR criteria, and therefore staff recommends that the resource is not eligible for listing on the CRHR.

Two sites included in the architectural survey area were noted as being potentially eligible under CRHR Criterion 4, ~~MS-B-1005~~P-36-021012 and MS-B-1008. They are outside the archaeological survey area. Both are presumed to be occupied ranches containing

multiple buildings, and both are early homestead sites. The structures on both sites are heavily modified or are not 45 years old, and neither was determined eligible under Criterions 1-3. The project would not impact any potential subsurface archaeological deposits on the sites. They are outside of the project boundary and would not be impacted by construction.

Summary of CRHR-Eligible Resources Subject to Potential Project Impacts

~~There is one significant archaeological resource within the area of analysis that could potentially be impacted by the AMS, P-36-006553. This is the only historical resource that needs to be taken into account when considering impacts from the project.~~

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE OF IMPACTS TO HISTORICAL RESOURCES

Under CEQA, "a project that may cause a substantial adverse change in the significance of an historical resource is a project that may have a significant effect on the environment" (Pub. Resources Code, § 21084.1). Thus, staff analyzes whether a proposed project would cause a substantial adverse change in the significance, that is, the CRHR eligibility, of all historical resources identified in the Cultural Resources Inventory as CRHR eligible. The degree of significance of an impact depends on:

- The cultural resource impacted;
- The nature of the resource's historical significance;
- How the resource's historical significance is manifested physically and perceptually;
- Appraisals of those aspects of the resource's integrity that figure importantly in the manifestation of the resource's historical significance; and
- How much the impact will change those integrity appraisals.

DIRECT/INDIRECT IMPACTS AND MITIGATION

In the abstract, direct impacts to cultural resources are those associated with project development, construction, and co-existence. Construction usually entails surface and subsurface disturbance of the ground, and direct impacts to archaeological resources may result from the immediate disturbance of the deposits, whether from vegetation removal, vehicle travel over the surface, earth-moving activities, excavation, or demolition of overlying structures. Construction can have direct impacts on historic standing structures when those structures must be removed to make way for new structures or when the vibrations of construction impair the stability of historic structures nearby. New structures can have direct impacts on historic structures when the new structures are stylistically incompatible with their neighbors and the setting, and when the new structures produce something harmful to the materials or structural integrity of the historic structures, such as emissions or vibrations.

Generally speaking, indirect impacts to archaeological resources are those which may result from increased erosion due to site clearance and preparation, or from inadvertent damage or outright vandalism to exposed resource components due to improved accessibility. Similarly, historic structures can suffer indirect impacts when project construction creates improved accessibility and vandalism or greater weather exposure becomes possible.

Ground disturbance accompanying construction at a proposed plant site, along proposed linear facilities, and at proposed laydown areas has the potential to directly impact archaeological resources, unidentified at this time. The potential direct, physical impacts of the proposed construction on unknown archaeological resources are commensurate with the extent of ground disturbance entailed in the particular mode of construction. This varies with each component of the proposed project. Placing the proposed plant into this particular setting could have a direct impact on the integrity of association, setting, and feeling of nearby standing historic structures.

Construction Impacts and Mitigation

The assessment of the potential direct impacts of the construction of the proposed project on historical resources is presented below. Mitigation proposals for significant effects to such resources, those effects that staff determines would cause a substantial adverse change in their significance, follow.

Identification and Assessment of Direct Impacts on Archaeological Resources and Recommended Mitigation

~~Staff finds that the construction of the proposed project would directly affect one known historical resource. That resource, historical archaeological site P-36-006553, would be wholly or partly destroyed as a result of grading and earth-moving operations that are integral components of the construction of the project. Staff further finds that such destruction to P-36-006553 would cause a substantial adverse change in the significance of the resource and would therefore be a significant effect on the environment. Staff proposes CUL-8, a program of phased investigation to recover a representative sample of the information for which the resource is presently assumed to be significant.~~

The construction of the proposed project would ~~also~~ entail subsurface ground disturbance to a depth greater than one meter below the present surface across different portions of the project site. Ground disturbance at depth can affect buried archaeological deposits that are not apparent on the surface and which may be significant under CRHR Criterion 4 (“likely to yield information important in history or prehistory”). More specifically, ground disturbance accompanying grading and construction at the proposed AMS plant site has the potential to directly impact unknown archaeological resources. The risk of potential direct, physical impacts from the proposed AMS construction on unidentified archaeological resources is commensurate with the extent of ground disturbance entailed in the particular mode of construction. This varies with each component of the proposed project. The proposed AMS construction activities which involve ground disturbance entail grading of the site and excavation for foundations of proposed equipment, and trenching for drainage channels. The greatest excavation depths into native soils anticipated for the AMS are

up to 10 feet for the foundations for the plant equipment and 26 feet for the drainage canals. Site grading would result in an overall elevation of approximately 2,065 feet amsl; the current site elevation ranges from 2,020 feet amsl to 2,105 feet amsl. Preliminary cut and fill volume is estimated at 4.2 million cubic yards (AMS 2009a, p. 5.17-37).

Staff, in consideration of the available evidence on prehistoric and historic fluctuations in the level of Lake Harper, concludes that the potential for the discovery of buried archaeological deposits is moderate to high across the whole of the project site. The results of the geoarchaeology study for the project site found evidence in the northeastern portion of the project site that indicates a prehistoric high lake stand that may have extended as high as 2,050 feet amsl. The geoarchaeologist for the applicant concluded, on that basis, that the potential for buried archaeological deposits in that portion of the project site is high between 2,050 and 2,025 amsl (SWCA 2009c, p. 29). The applicant also notes high stands for Harper Lake as high as 2,160 amsl in the historic period (AMS 2009a, p. 5.17-18). The sedimentological evidence from the geoarchaeology study and the historic archival evidence, taken together, appear to demonstrate that former shorelines of Harper Lake have traversed the entire breadth of the project site through time. Staff concludes that the prehistoric human use of Harper Lake natural resources and the material remains of that behavior along those multiple former shorelines are plausible across the entire project site.

Because of the possibility that buried prehistoric archaeological deposits could be encountered during construction, CEQA advises a lead agency to provide for such a contingency, and the project owner may be required to train workers to recognize cultural resources, fund mitigation, and delay construction in the area of the find (Pub. Resources Code, § 21083.2; Cal. Code Regs., tit. 14, §§ 15064.5(f) and 15126.4(b)). Consequently, staff proposes that procedures for identifying, evaluating, and possibly mitigating impacts to newly discovered archaeological resources be put in place in conditions of certification to reduce those impacts to a less-than-significant level.

To that end as well, the applicant has suggested a number of measures intended to mitigate potential impacts to archaeological resources that could be discovered during the construction of the proposed AMS project (AS 2009a, p. 5.4-42 – 5.4-43). The applicant's suggested mitigation measures include the following:

Evaluation and Documentation. In the event that a resource cannot be avoided during construction, the applicant would retain a qualified Cultural Resources Specialist to prepare and implement an evaluation program to assess the significance of the resource and prepare a treatment plan for significant resources. The Cultural Resources Specialist would meet the qualifications for a Principal Investigator per the Secretary of the Interior's Guidelines.

Mitigation for Resource. Should a resource be discovered that is determined to be, in consultation with the Energy Commission, significant, a mitigation plan would be developed and carried out in accordance with State and Federal Guidelines. The appropriate DPR forms would be completed and a technical report prepared.

Crew Education. Training would be given to construction personnel by the monitoring archaeologists on procedures for the handling of discovered archaeological resources, including the need to stop work until a qualified archaeologist has assessed the significance of the find and implemented appropriate mitigation measures.

Collection and Curation: Cultural materials, field notes and other pertinent materials collected as part of an assessment or data recovery mitigation would be curated at a qualified curation facility.

Human Remains: Should human remains be encountered during excavation, work shall be stopped, the Cultural Resources Specialist would notify the Principal Investigator and the Energy Commission would be contacted. All applicable State and Federal laws, including NAGPRA, would be followed and the remains treated with respect.

Although staff concurs with many of the applicant's suggested mitigation measures, staff has added additional proposals or expanded upon the applicant's suggestions to ensure that all impacts to cultural resources are mitigated to below the level of significance. The applicant's suggested mitigation measures and staff's additional proposals are incorporated into the proposed Conditions of Certification **CUL-1** through **CUL-**~~8~~7, below, intended to provide for the contingency of discovering archaeological resources during AMS construction and related activities. Staff's proposed **CUL-1** requires a Cultural Resources Specialist (CRS) to be retained and available during the AMS's construction-related excavations to evaluate any discovered buried resources and, if necessary, to conduct data recovery as mitigation for the project's unavoidable impacts on them. **CUL-2** would require the applicant to provide the CRS with all relevant cultural resources information and maps. **CUL-3** would require the CRS to write and submit to the Energy Commission Compliance Project Manager (CPM) a Cultural Resources Monitoring and Mitigation Plan (CRMMP). **CUL-4** would require the CRS to write and submit to the CPM a final report on all AMS cultural resources monitoring and mitigation activities. **CUL-5** would require the project owner to train workers to recognize cultural resources and instruct them to halt construction if cultural resources are discovered. **CUL-6** proposes archaeological monitoring, by an archaeologist and, possibly, by a Native American, intended to identify buried prehistoric archaeological deposits. **CUL-7** would require the applicant to halt ground-disturbing activities in the area of an archaeological discovery and to fund data recovery, if the discovery is evaluated as CRHR-eligible. ~~CUL-8 provides for the conclusion of efforts to evaluate the historical significance of P-36-006553 and the recovery of a representative sample of the information that makes the site eligible for listing in the CRHR~~.

Staff's proposed mitigation measures for ~~concluding the evaluation and recovering significant information from historical archaeological site P-36-006553, and for~~ identifying, evaluating, and possibly mitigating impacts to previously unknown archaeological resources discovered during construction ensure that impacts to significant archaeological discoveries would be mitigated to a less than significant level.

Identification and Assessment of Direct Impacts on Ethnographic Resources and Recommended Mitigation

No ethnographic resources, either previously recorded or newly disclosed in the communications with Native American groups conducted by the applicant for the proposed project or by staff, were identified in the vicinity of the project. The proposed project would, therefore, have no significant impact on ethnographic resources, and no mitigation for impacts to this class of cultural resources would be necessary.

Identification and Assessment of Direct Impacts on Historic Standing Structures and Recommended Mitigation

No built-environment resources that qualify as historical resources under CEQA are now known or likely to be found in the project area of analysis. The proposed project would, therefore, have no significant impact on built-environment resources, and no mitigation for impacts to this class of cultural resources would be necessary.

Identification and Assessment of Indirect Impacts and Recommended Mitigation

Neither the applicant nor staff identified any indirect impacts to any identified cultural resources in the impact areas of the proposed AMS project, and so no mitigation measures for indirect impacts would be necessary for any class of cultural resources.

Operation Impacts and Mitigation

During operation of the proposed AMS project, if a leak should develop in the gas or water pipelines supplying any part of the plant, repair of the buried utility could require the excavation of a large hole. Such repairs could impact previously unknown subsurface archaeological resources in areas unaffected by the original excavation. The measures proposed above and below to mitigate impacts to previously unknown archaeological resources found during the construction of the proposed project would also serve to mitigate impacts that occur due to repairs that are made during the operation of the plant.

Cumulative Impacts and Mitigation

A cumulative impact refers to a proposed project's incremental effects considered over time and together with those of other, nearby, past, present, and reasonably foreseeable future projects whose impacts may compound or increase the incremental effect of the proposed project (Pub. Resources Code sec. 21083; Cal. Code Regs., tit. 14, secs. 15064(h), 15065(a)(3), 15130, and 15355). Cumulative impacts to cultural resources in the AMS project vicinity could occur if any other existing or proposed projects, in conjunction with the proposed AMS, had or would have impacts on cultural resources that, considered together, would be significant. The previous ground disturbance from prior projects and the ground disturbance related to the future construction of the AMS and other proposed projects in the vicinity could have a cumulatively considerable effect on subsurface archaeological deposits, both prehistoric and historic. The alteration of the setting which could be caused by the construction and operation of the proposed AMS and other proposed projects in the vicinity could be cumulatively considerable, but may or may not be a significant impact to cultural resources.

The applicant has reviewed the San Bernardino County Planning Department website and spoken to planning staff, and there are not currently any open applications for development projects within a 6-mile radius of the project. As of the date of the application submission, the nearest energy-related project is 43 miles away. The applicant therefore concluded that the AMS was not expected to result in significant cumulative impacts to cultural resources. (AS 2009a, p. 5.4-41 – 5.4-42).

Staff has proposed conditions of certification that would mitigate AMS's impacts to known CRHR-eligible cultural resources to below the level of significance. Staff has also proposed conditions of certification for the AMS project providing for identification, evaluation, and avoidance or mitigation of impacts to previously unknown CRHR-eligible archaeological resources discovered during the construction of the project.

Proponents of any other future projects in the AMS area could mitigate impacts to unanticipated subsurface archaeological sites to less than significant levels by requiring construction monitoring, evaluation of resources discovered during monitoring, and avoidance or data recovery for resources evaluated as CRHR-eligible. Impacts to human remains can be mitigated by following the protocols established by state law in Public Resources Code, section 5097.98. Since the impacts from the proposed AMS project would be mitigated to a less than significant level by the project's compliance with staff's proposed Conditions of Certification **CUL-1** through **CUL-~~8~~7**, and since similar protocols can be applied to other projects in the area, staff does not expect any incremental effects on cultural resources of the proposed AMS project to be cumulatively considerable when viewed in conjunction with other projects.

COMPLIANCE WITH LORS

If staff's proposed conditions of certification (below) are properly implemented, the proposed AMS project would result in a less than significant impact on known and newly found cultural resources. The proposed AMS project would therefore be in compliance with applicable state laws, ordinances, regulations, and standards listed in Cultural Resources Table 1.

The County of San Bernardino's General Plan has language promoting the general county-wide preservation of cultural resources, outlining five policies specific to cultural resources. The conditions of certification require specific actions not just to promote but to effect historic preservation and mitigate impacts to all cultural resources in order to ensure CEQA compliance. Consequently, if AMS implements these conditions, its actions would be consistent with the general historic preservation goals of the County of San Bernardino.

CONCLUSIONS AND RECOMMENDATIONS

Staff's cultural resources analysis has ~~determined that the proposed AMS project would have a significant direct impact on P-36-006553, a historical archaeological site assumed to be a historical resource for the purpose of this analysis, and has further~~ determined that the project has a moderate to high potential to have significant direct impacts on unknown buried prehistoric archaeological deposits.

Staff recommends that the Commission adopt the following cultural resources Conditions of Certification, **CUL-1** through **CUL-~~8~~7,** to reduce the known and potential impacts of the proposed project to a less than significant level. The subject conditions are variously intended ~~to mitigate for the whole or partial loss of P-36-006553,~~ to facilitate the identification and assessment of unanticipated discoveries of historical resources encountered during construction, and to mitigate any significant impacts from the project on these ~~latter~~ resources if they should be found to be significant. To facilitate the identification and mitigations, the conditions provide for the hiring of a Cultural Resources Specialist and archaeological monitors, for cultural resources awareness training for construction workers, for the archaeological monitoring of ground-disturbing activities, for the recovery of data from significant discovered archaeological deposits, for the writing of a technical archaeological report on all archaeological activities and findings, and for the curation of recovered artifacts and other data. When properly implemented and enforced, staff believes that these conditions of certification would reduce to less than significant known impacts to historical resources and any impacts to unanticipated discoveries of historical resources encountered during construction or operation. Additionally, with the adoption and implementation of these conditions, the proposed AMS project would be in conformity with all applicable laws, ordinances, regulations, and standards.

PROPOSED CONDITIONS OF CERTIFICATION

CUL-1 Prior to the start of ground disturbance (includes "preconstruction site mobilization"; "construction 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 required in accordance with the Conditions of Certification (Conditions). The CRS may elect to obtain the services of Cultural Resources Monitors (CRMs) and other technical specialists, if needed, to assist in monitoring, mitigation, and curation activities. The project owner shall ensure that the CRS makes recommendations regarding the eligibility for listing in the California Register of Historical Resources (CRHR) of any cultural resources that are newly discovered or that may be affected in an unanticipated manner. No ground disturbance shall occur prior to 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 non-compliance on this or other 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

is not halted. The halting or redirection of construction 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 eligibility, and recommendations for mitigation of any cultural resources discoveries, whether or not a determination of significance has been made.

2. The CRS has completed field notes, measurements, and photography for a DPR 523 "Primary" form. The "Description" entry of the DPR 523 "Primary" form shall include a recommendation on the significance of the find. The project owner shall submit completed forms to the CPM.

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

Verification:

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, and CRMs have the authority to halt construction activities 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. Completed DPR 523 forms for resources newly discovered during construction 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-8 Prior to site mobilization or construction-related ground disturbance 30 meters within the boundary and inclusive of historical archaeological site P-36-006553, the project owner shall submit, for CPM approval a Cultural Resources Treatment Plan (CRTP), completed by or under the direction of the CRS. The submitted CRTP shall include the proposed personnel, methods, and research framework to conclude the evaluation of the historical significance of P-36-006553 and to recover a representative sample of the information for which Energy Commission staff may determine the site to be eligible for listing in the CRHR. The CRTP should further include discussions on artifact retention and disposal protocols, and curation provisions, as related to the research questions formulated in the research framework.~~

~~The project owner shall ensure that all tasks under the CRTP are undertaken by or under the direction of the CRS, who shall employ persons for these tasks having the minimum qualifications of a CRM.~~

~~The project owner shall ensure that the requisite updates to the DPR 523 Primary and detail forms, as shall be specified in the approved CRTP, are completed and shall provide for CPM approval a technical report, in ARMR format, on activities carried out under the CRTP, with requisite DPR 523 series forms included as an appendix.~~

~~No ground disturbance shall occur 30 meters within the boundary and inclusive of historical archaeological site P-36-006553 prior to completion of the tasks identified in the CRTP, or additionally required by the CPM, and prior to CPM approval of the submitted final technical report on all activities carried out under the CRTP, unless specifically approved by the CPM.~~

~~Verification:~~

~~1. At least 135 days prior to the start of construction-related ground disturbance 30 meters within the boundary and inclusive of historical archaeological site P-36-006553, the project owner shall submit the CRTP for CPM approval.~~

~~2. At least 75 days prior to ground disturbance 30 meters within the boundary and inclusive of historical archaeological site P-36-006553, the project owner shall submit for CPM approval a written recommendation on the CRHR eligibility of P-36- 006553 that is supported by the preliminary results of the archival and field research done under the CRTP for the purpose of concluding the evaluation of the historical significance of the subject resource, in addition to the results of prior investigations on the resource.~~

~~3. At least 30 days prior to ground disturbance 30 meters within the boundary and inclusive of historical archaeological site P-36-006553, the project owner shall submit for CPM approval a final technical report (in ARMR format) that provides personnel, methods, findings, and completed DPR 523 forms for all cultural resources activities completed pursuant to the CRTP.~~

CULTURAL RESOURCES ACRONYM GLOSSARY

AFC	Application for Certification
AMS	Abengoa Mojave Solar
ARMR	Archaeological Resource Management Report
BCE	Before Common Era
CE	Common Era
CEQA	California Environmental Quality Act
CHRIS	California Historical Resources Information System

Conditions	Conditions of Certification
CRHR	California Register of Historical Resources
CRM	Cultural Resources Monitor
CRMMP	Cultural Resources Monitoring and Mitigation Plan
CRR	Cultural Resource Report
CRS	Cultural Resources Specialist
DPR 523	Department of Parks and Recreation cultural resource inventory form
FSA	Final Staff Assessment
LORS	Laws, ordinances, regulations, and standards
MCR	Monthly Compliance Report
MLD	Most Likely Descendent
NAHC	Native American Heritage Commission
NRHP	National Register of Historic Places
OHP	Office of Historic Preservation
PSA	Preliminary Staff Assessment
SHPO	State Historic Preservation Officer
Staff	Energy Commission cultural resources technical staff
WEAP	Worker Environmental Awareness Program

REFERENCES

The *TN: 00000* in a reference below indicates the transaction number under which the item is catalogued in the Energy Commission's Docket Unit. The transaction number allows for quicker location and retrieval of individual items docketed for a case or used for ease of reference and retrieval of exhibits cited in briefs and used at Evidentiary Hearings.

Apple and Glenny 2008—Rebecca McCorkle Apple and Wayne Glenny. "Beacon Solar Project Archaeological Resource Report, Kern County, California," confidential appendix, Beacon Solar, LLC, Application for Certification. Dated 3/13/08. Submitted to CEC/Docket Unit on 3/14/08.

AS 2009a - Abengoa Solar Inc. / E. Garcia (TN 52813). Application for Certification for Mojave Solar Project (09-AFC-5), dated 7/2009. Submitted to CEC on 8/10/2009.

AS 2009b - Abengoa Solar Inc. / E. Garcia (TN 53375). Data Adequacy Supplement for Mojave Solar Project (09-AFC-5), dated 9/24/2009. Submitted to CEC on 9/24/2009.

Bamforth 1990—Douglas B. Bamforth. "Settlement, Raw Material, and Lithic Procurement in the Central Mojave Desert," Journal of Anthropological Archaeology, vol. 9, pp. 70-104.

Basgall 1993 Mark E. Basgall. "The Archaeology of Nelson Basin and Adjacent Areas, Fort Irwin, San Bernardino County, California." Report submitted to the U.S. Army Corps of Engineers, Los Angeles, 1993.

Bean and Shipek 1978—L. J. Bean and F C. Shipek, "Luiseño," in *Handbook of North American Indians, Vol. 8*. Robert F. Heizer, ed. Washington, D. C.: Smithsonian Institution, 1978.

Bean and Smith 1978—L. J. Bean and C. R. Smith, "Gabrielino," in *Handbook of North American Indians, Vol. 8*. Robert F. Heizer, ed. Washington, D. C.: Smithsonian Institution, 1978.

Campbell 1936—Elizabeth W. Crozer Campbell. "Archaeological Problems in the Southern California Deserts," American Antiquity, vol. 1, no. 4, pp. 295-300.

CEC 2009n—CEC / C. Hoffman (TN 53770). Data Request Set 1 B (nos. 1-86), dated 10/26/2009. Submitted to CEC on 10/26/2009.

Douglas, et al., 1988 C. L. Douglas, D. L. Jenkins, and C. N. Warren. "Spatial and Temporal Variability in Faunal Remains from Four Lake Mojave-Pinto Period Sites in the Mojave Desert," in Early Human Occupation in Far Western North America: The Clovis-Archaic Interface, J. A. Willig, C. Melvin Aikens, and J. L Fagan, eds., pp. 131-144, Nevada State Museum Anthropological Papers No. 21.

EDAW 2009a—EDAW / T. ~~Meisner~~ Meiser (TN 53000). Application for Confidential – Cultural Resource Technical Report, dated 8/24/2009. Submitted to CEC on 8/26/2009.

ESH 2009b—Ellison, Schneider and Harris / C. Ellison (TN 54151). Notice of request for additional time for Data Request 1 B, dated 11/16/09. Submitted to CEC on 11/16/2009.

ESH 2009d—Ellison, Schneider and Harris / C. Ellison (TN 54268). Written Responses to Data Request Set 1B (nos. 1-86), dated 11/25/2009. Submitted to CEC on 11/25/2009.

ESH 2009g—Ellison, Schneider and Harris / C. Ellison (TN 54581). Supplemental Written Responses to Data Request Set 1 B (nos. 1-86), dated 12/23/2009. Submitted to CEC on 12/23/2009.

volatility, and/or low toxicity. The project will be limited to using, storing, and transporting only those hazardous materials listed in Appendix A of this section as per staff's proposed condition **HAZ-1**.

After removing from consideration those chemicals that pose no risk of off-site impact in Steps 1 and 2, staff continued with Steps 3, 4, and 5 to review the remaining hazardous materials: natural gas and Therminol VP-1™, the proposed heat transfer fluid (HTF).

Large Quantity Hazardous Materials

Natural Gas

Natural gas poses a fire and/or possible explosion risk because of its flammability. Natural gas is composed of mostly methane, but also contains ethane, propane, nitrogen, butane, isobutene, and isopentane. It is colorless, odorless, tasteless and lighter than air. Natural gas can cause asphyxiation when methane is 90% in concentration. Methane is flammable when mixed in air at concentrations of 5-14%, which is also the detonation range. Natural gas, therefore, poses a risk of fire and/or possible explosion if a release occurs under certain specific conditions. However, it should be noted that, due to its tendency to disperse rapidly (Lees 1998), natural gas is less likely to cause explosions than many other fuel gases such as propane or liquefied petroleum gas, but can explode under certain confined conditions (as demonstrated by the recent natural gas detonation in Belgium in July 2004).

Natural gas at the proposed facility will only be used to fuel the auxiliary boilers and for domestic uses (such as space heating). It will not be stored on-site but delivered via an existing Southwest Gas Corporation pipeline that reaches the project's boundary (AS 2009a, Section 5.6.3.5). Approximately two miles of pipeline would be installed within the site boundaries to deliver natural gas to both power blocks (AS 2009a, Section 2.5). Approximately 140 pounds of natural gas would be contained in on-site equipment and piping (ESH 2009c, Table 8). The risk of a fire and/or explosion on site can be reduced to insignificant levels through adherence to applicable codes and the development and implementation of effective safety management practices. The National Fire Protection Association (NFPA) code 85A requires both the use of double-block and bleed valves for gas shut off and automated combustion controls. These measures will significantly reduce the likelihood of an explosion in gas-fired equipment. The safety management plan proposed by the applicant would address the handling and use of natural gas, and would significantly reduce the potential for equipment failure because of either improper maintenance or human error.

Therminol VP-1<u>(or equivalent such as Downtherm A)</u>

Therminol VP1 is the heat transfer fluid (HTF) that will be used in the solar panels to collect solar heat and transfer it in order to generate steam to run the steam turbines. Therminol is a mixture of 73.5% diphenyl ether and 26.5% biphenyl, and is a solid at temperatures below ~54 °F. Therminol can therefore be expected to remain liquid if a spill occurs. While the risk of off-site migration is minimal, Therminol is highly flammable and fires have occurred at other solar generating stations that use it. Approximately 2,292,000 gallons of HTF will be stored at the AMS contained in the pipes and heat

exchanger. Isolation valves would be placed throughout the HTF piping system designed to automatically block off sections of the piping in which a loss of pressure is detected (AS 2009a, Section 5.6.3.3).

Staff has assessed the properties of Therminol, and reviewed the record of its use at Solar Electric Generating Stations 8 and 9 at Harper Lake, California. Past leaks, spills, and fires involving this HTF were examined and discussed. It appears that the placement of additional isolation valves in the HTF pipe loops throughout the solar array would add significantly to the safety and operational integrity of the entire system by allowing a loop to be closed if a leak develops in a ball joint, flex-hose, or pipe, instead of closing off the entire HTF system and shutting down the plant. In order to ensure that HTF leaks do not pose a significant risk, staff proposes Condition of Certification **HAZ-4,** which would require the project owner to install a sufficient number of isolation valves that are automatically, manually, and remotely activated.

The AFC indicates that the Alpha site will be bisected by Harper Lake Road and that the west side of the Alpha solar field will be disconnected from the power block by this road. Since the control room and power block will be located on the east parcel of the Alpha site, pipes carrying heat transfer fluid (HTF), all command and control systems, and the fire water loop will be required to cross Harper Lake Road either above or beneath the road. Staff has discussed this with the applicant and the applicant has stated that all HTF and command and control lines will be placed underground when crossing Harper Lake Road. The lines would be installed in a protective structure underneath the road and the HTF pipes would have expansion loops aboveground on either side of the road. In order to ensure that all HTF pipes and command and control system cross existing roads underground, staff proposes Condition of Certification **HAZ-7**.

Mitigation

Staff believes that this project's use of hazardous materials poses no significant risk only if mitigation measures are used. These mitigation measures are discussed in this section. The potential for accidents resulting in the release of hazardous materials is greatly reduced by the implementation of a Safety Management Program, which includes both engineering and administrative controls. Elements of facility controls and the safety management plan are summarized below.

Engineering Controls

Engineering controls help to prevent accidents and releases (spills) from moving off site and affecting communities by incorporating engineering safety design criteria in the design of the project. The engineered safety features proposed by the applicant for use at the AMS project include:

- Storage of small quantity hazardous materials in original, properly labeled containers;
- Construction of secondary containment areas surrounding each of the bulk hazardous materials storage areas designed to contain accidental releases that might happen during storage or delivery plus the volume of rainfall associated with a 25-year, 24-hour storm;

- Physical separation of stored chemicals in isolated containment areas in order to prevent accidental mixing of incompatible materials, which could result in the evolution and release of toxic gases or fumes;
- Installation of a fire protection system for hazardous materials storage areas; and
- Continuous monitoring of HTF piping system by plant staff and ~~by automatic pressure sensors designed to trigger~~appropriately designed isolation ~~valves~~ methods if a leak is detected.

Administrative Controls

Administrative controls also help prevent accidents and releases (spills) from moving off site and affecting neighboring communities by establishing worker training programs, process safety management programs, and complying with all applicable health and safety laws, ordinances, and standards.

A worker health and safety program will be prepared by the applicant and include (but not be limited to) the following elements (see the **WORKER SAFETY AND FIRE PROTECTION** section for specific regulatory requirements):

- Worker training regarding chemical hazards, health and safety issues, and hazard communication;
- Procedures to ensure the proper use of personal protective equipment;
- Safety operating procedures for the operation and maintenance of systems utilizing hazardous materials;
- Fire safety and prevention; and
- Emergency response actions including facility evacuation, hazardous material spill clean-up, and fire prevention.

At the facility, the project owner will be required to designate an individual with the responsibility and authority to ensure a safe and healthful work place. The project health and safety official will oversee the health and safety program and have the authority to halt any action or modify any work practice to protect the workers, facility, and the surrounding community in the event of a violation of the health and safety program.

Staff's proposed Condition of Certification **HAZ-1** ensures that no hazardous material would be used at the facility except as listed in Tables 7-10 of Data Response Item 76 (ESH 2009c), which have been reviewed by staff to determined the need and appropriateness of their use. **HAZ-1** also requires changes to the allowed list of hazardous materials and their maximum amounts to be approved by the Compliance Project Manager. Only those that are needed and appropriate would be allowed to be used. If staff feels that a safer alternative chemical can be used, staff would recommend or require its use, depending upon the impacts posed.

Additional administrative controls are required by Conditions of Certification **HAZ-2** (preparation of a Hazardous Materials Business Plan, a Process Safety Management Plan, and a Spill Prevention, Control, and Countermeasure Plan) and **HAZ-3** (development of a Safety Management Plan).

PROPOSED CONDITIONS OF CERTIFICATION

HAZ-1 The project owner shall not use any hazardous materials not listed in Appendix A, below, or in greater quantities or strengths than those identified by chemical name in Appendix A, below, unless approved in advance by the Compliance Project Manager (CPM).

Verification: The project owner shall provide to the CPM, in the Annual Compliance Report, a list of hazardous materials contained at the facility.

HAZ-2 The project owner shall provide a Hazardous Materials Business Plan (HMBP), a Spill Prevention, Control, and Countermeasure Plan (SPCC), and a Process Safety Management Plan (PSMP) to the San Bernardino County Fire Department and the CPM for review. After receiving comments from the San Bernardino County Fire Department and the CPM, the project owner shall reflect all final recommendations in the final documents. Copies of the final HMBP, SPCC, and PSMP shall then be provided to the San Bernardino County Fire Department for information and to the CPM for approval.

[Rationale for Edits: The proposed language is acceptable with a minor edit that would allow the discussion of proposed recommendations and once recommendations are finalized, through discussions between the above identified parties.]

Verification: At least 60 days prior to receiving any hazardous material on the site for commissioning or operations, the project owner shall provide a copy of a final Hazardous Materials Business Plan, Spill Prevention, Control, and Countermeasure Plan, and a Process Safety Management Plan to the CPM for approval.

HAZ-3 The project owner shall develop and implement a Safety Management Plan for the delivery and handling of liquid hazardous materials. The plan shall include procedures, protective equipment requirements, training and a checklist. It shall also include a section describing all measures to be implemented to prevent mixing of incompatible hazardous materials. This plan shall be applicable during construction, commissioning, and operation of the power plant.

Verification: At least sixty (60) days prior to the delivery of any liquid hazardous material to the facility, the project owner shall provide a Safety Management Plan as described above to the CPM for review and approval.

HAZ-4 The project owner shall place an adequate number of isolation valves in the Heat transfer Fluid (HTF) pipe loops so as to be able to isolate a solar ~~panel~~ collector loop in the event of a leak of fluid. These valves shall be actuated automatically, manually, ~~and~~ remotely, or locally as determined during detailed engineering design. The detailed engineering design drawings showing the number, location, and type of isolation valves shall be provided to the CPM for review and approval prior to the commencement of the solar array construction.

[Rationale for Edits: The design of the solar field piping was considered by the Applicant between the time the application was filed and the Staff Assessment was released. This consideration included reviewing existing designs at the SEGS facilities near the project. The inclusion of remote, automatic valves on each loop would not likely result in the intended benefit since the location of a leak is difficult to identify by pressure or other automatic methods and could generate an unreliable facility. The Applicant's understanding is that the existing SEGS facilities utilize isolation valves on major headers (automatic or manual) along with manual valves to isolate loops.

The isolation of a leak is performed by isolating the main header to a solar field section and the leak rapidly slows. These main isolation valves can be remotely operated. This action is followed by inspection and manual isolation of the leaking solar collector array loop.

The Applicant is suggesting allowing for an isolation method that has proven successful in the past at SEGS.]

Verification: At least sixty (60) days prior to the commencement of solar array construction, the project owner shall provide the design drawings as described above to the CPM for review and approval.

HAZ-5 Prior to commencing construction, a site-specific Construction Site Security Plan for the construction phase shall be prepared and made available to the CPM for review and approval. The Construction Security Plan shall include the following:

1. Perimeter security consisting of fencing enclosing the construction area;
2. Security guards;
3. Site access control consisting of a check-in procedure or tag system for construction personnel and visitors;
4. Written standard procedures for employees, contractors and vendors when encountering suspicious objects or packages on site or off site;
5. Protocol for contacting law enforcement and the CPM in the event of suspicious activity or emergency; and
6. Evacuation procedures.

Verification: At least thirty (30) days prior to commencing construction, the project owner shall notify the CPM that a site-specific Construction Security Plan is available for review and approval.

~~**HAZ-6** The project owner shall also prepare a site-specific security plan for the commissioning and operational phases that will be available to the CPM for review and approval. The project owner shall implement site security measures that address physical site security and hazardous materials~~

storage. The level of security to be implemented shall not be less than that described below (as per NERC 2002).

The Operation Security Plan shall include the following:

1. Permanent full perimeter fence or wall, at least eight feet high and topped with barbed wire or the equivalent;

2. Main entrance security gate, either hand operated or motorized;

3. Evacuation procedures;

4. Protocol for contacting law enforcement and the CPM in the event of suspicious activity or emergency;

5. Written standard procedures for employees, contractors, and vendors when encountering suspicious objects or packages on site or off site;

   A. A statement (refer to sample, **ATTACHMENT A**), signed by the project owner certifying that background investigations have been conducted on all project personnel. Background investigations shall be restricted to determine the accuracy of employee identity and employment history and shall be conducted in accordance with state and federal laws regarding security and privacy;

   B. A statement(s) (refer to sample, **ATTACHMENT B**), signed by the contractor or authorized representative(s) for any permanent contractors or other technical contractors (as determined by the CPM after consultation with the project owner), that are present at any time on the site to repair, maintain, investigate, or conduct any other technical duties involving critical components (as determined by the CPM after consultation with the project owner) certifying that background investigations have been conducted on contractors who visit the project site;

6. Site access controls for employees, contractors, vendors, and visitors;

7. A statement(s) (refer to sample, **ATTACHMENT C**), signed by the owners or authorized representative of hazardous materials transport vendors, certifying that they have prepared and implemented security plans in compliance with 49 CFR 172.802, and that they have conducted employee background investigations in accordance with 49 CFR Part 1572, subparts A and B;

8. Closed circuit TV (CCTV) monitoring system, recordable, and viewable in the power plant control room and security station (if separate from the control room) with cameras able to pan, tilt, and zoom, have low-light capability, and are able to view the outside entrance to the control room and the front gate; and

9. Additional measures to ensure adequate perimeter security consisting of either:

   A. Security guard(s) present 24 hours per day, 7 days per week; **or**

   B. Power plant personnel on site 24 hours per day, 7 days per week,

      and

      the CCTV able to view 100% of the entire solar array fenceline perimeter

      or breach detectors **or** on-site motion detectors along the entire solar array fenceline.

The project owner shall fully implement the security plans and obtain CPM approval of any substantive modifications to those security plans. The CPM may authorize modifications to these measures, or may require additional measures such as protective barriers for critical power plant components – transformers, gas lines, and compressors – depending upon circumstances unique to the facility or in response to industry-related standards, security concerns, or additional guidance provided by the U.S. Department of Homeland Security, the U.S. Department of Energy, or the North American Electrical Reliability Council, after consultation with both appropriate law enforcement agencies and the applicant.

[Rationale: The discussion above regarding site security (see page 5.4-13) concludes that the proposed AMS facility would not be subject to the U.S Department of Homeland Security's Interim Final Rule published in the Federal Register (6 CFR Part 27) requiring facilities that use or store certain hazardous materials to conduct vulnerability assessments and implement certain specified security measures or the publication of Appendix A, the list of chemicals, on November 2, 2007. The Applicant proposes the deletion of this Condition of Certification because the project is not subject to these requirements; however, the Applicant notes that its 24 hour personnel meet the spririt of these requirements.]

Verification: At least thirty (30) days prior to the initial receipt of hazardous materials on site, the project owner shall notify the CPM that a site-specific operations site security plan is available for review and approval. In the annual compliance report, the project owner shall include a statement that all current project employee and appropriate contractor background investigations have been performed, and that updated certification statements have been appended to the operations security plan. In the annual compliance report, the project owner shall include a statement that the operations security plan includes all current hazardous materials transport vendor certifications for security plans and employee background investigations.

HAZ-7 The project owner shall ensure that all pipes carrying heat transfer fluid (HTF), all command and control systems, and the fire water loop that are

required to cross Harper Lake Road or Lockhart Road will be placed underground for the crossing. The pipes and lines shall be installed in a protective structure underneath the road and the HTF pipes shall have expansion loops aboveground on either side of the road. The engineering design plans shall be provided to the CPM for review and approval prior to the commencement of the solar array construction.

Verification: At least sixty (60) days prior to the commencement of solar array piping construction, the project owner shall provide the design drawings as described above to the CPM for review and approval.

[Rationale for Edits: The solar array includes many aspects, one of which is piping, which is relevant to the condition. Other aspects of the solar array including foundations, mirror structures, control and power wiring, and such should be able to begin independently of this condition.]

- If the noise is project related, take all feasible measures to reduce the source of the noise; and
- Submit a report documenting the complaint and actions taken. The report shall include: a complaint summary, including the final results of noise reduction efforts and, if obtainable, a signed statement by the complainant stating that the noise problem has been resolved to the complainant's satisfaction.

Verification: Within five days of receiving a noise complaint, the project owner shall file a Noise Complaint Resolution Form, shown below, with both the local jurisdiction and the CPM, that documents the resolution of the complaint. If mitigation is required to resolve the complaint, and the complaint is not resolved within a three-day period, the project owner shall submit an updated Noise Complaint Resolution Form when the mitigation is performed and complete.

EMPLOYEE NOISE CONTROL PROGRAM

NOISE-3 The project owner shall submit to the CPM for review and approval a noise control program. The noise control program shall be used to reduce employee exposure to high (above permissible) noise levels during construction in accordance to the applicable OSHA and Cal-OSHA standards.

Verification: At least 30 days prior to the start of ground disturbance, the project owner shall submit the noise control program to the CPM. The project owner shall make the program available to Cal-OSHA upon request.

NOISE RESTRICTIONS

NOISE-4 The project design and implementation shall include appropriate noise mitigation measures adequate to ensure that the operation of the project will not cause the noise levels due to plant operation alone, during the daylight hours (when the project is capable of producing electricity), to exceed an average of 53 dBA measured at or near monitoring location LT-1 (15563 Edie Road), an average of 40 dBA measured at or near monitoring location LT-2 (41234 Harper Lake Road), an average of 52 dBA measured at or near monitoring location ST-1 (15635 Lockhart Road), and an average of 46 dBA measured at or near monitoring location ST-2 (15654 Roy Road).

Also, 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 four quietest consecutive hours of the nighttime, to exceed an average of 22 dBA measured at or near monitoring location LT-1 (15563 Edie Road), an average of 7 dBA measured at or near monitoring location LT-2 (41234 Harper Lake Road), an average of 21 dBA measured at or near monitoring location ST-1 (15635 Lockhart Road), and an average of 15 dBA measured at or near monitoring location ST-2 (15654 Roy Road).

All noise limitations contained in NOISE-4 are independent of ambient levels. The limitations are placed on noise created by the project plant operation alone.

No new pure-tone components shall be caused by the project. No single piece of equipment shall be allowed to stand out as a source of noise that draws legitimate complaints.

A. When the project first achieves a sustained output of 90% or greater of rated capacity, the project owner shall conduct a 25-hour community noise survey at monitoring location LT-1, or at a closer location acceptable to the CPM. This survey shall be conducted during a windy day. This survey during the power plant's full-load operation shall also include measurement of one-third octave band sound pressure levels to ensure that no new pure-tone noise components have been caused by the project.

   During the period of this survey, the project owner shall conduct a short-term survey of noise at each of the monitoring locations LT-2, ST-1, and ST-2, or at closer locations acceptable to the CPM. The short-term noise measurements at these locations shall be conducted during the daylight hours and again during the nighttime hours of 10:00 p.m. to 7:00 a.m.

   The measurement of power plant noise for the purposes of demonstrating compliance with this condition of certification may alternatively be made at a location, acceptable to the CPM, closer to the plant (e.g., 400 feet from the plant boundary) and this measured level then mathematically extrapolated to determine the plant noise contribution at the affected residence. The character of the plant noise shall be evaluated at the affected receptor locations to determine the presence of pure tones or other dominant sources of plant noise.

B. If the results from the noise survey indicate that the power plant noise at the affected receptor sites exceeds the above values during the above specified period(s) of time, mitigation measures shall be implemented to reduce noise to a level of compliance with these limits.

C. If the results from the noise survey indicate that pure tones are present, mitigation measures shall be implemented to eliminate the pure tones.

[Rationale: The purpose of the proposed language is to clarify that the limits are not "Project plus Ambient" but rather the difference between "Project plus Ambient" and "Ambient", resulting in the noise created by the "Project Alone."]

Verification: The survey shall take place within 30 days of the project first achieving a sustained output of 90% or greater of rated capacity. Within 15 days after completing the survey, the project owner shall submit a summary report of the survey to the CPM. Included in the survey report will be a description of any additional mitigation measures necessary to achieve compliance with the above listed noise limit, and a schedule, subject to CPM approval, for implementing these measures. When these measures are in place, the project owner shall repeat the noise survey.

Within 15 days of completion of the new survey, the project owner shall submit to the CPM a summary report of the new noise survey, performed as described above and showing compliance with this condition.

OCCUPATIONAL NOISE SURVEY

NOISE-5 Following the project's attainment of a sustained output of 90% or greater of its rated capacity, the project owner shall conduct an occupational noise survey to identify any noise hazardous areas in the facility.

The survey shall be conducted by a qualified person in accordance with the provisions of Title 8, California Code of Regulations, sections 5095-5099 (Article 105) and Title 29, Code of Federal Regulations, section 1910.95. The survey results shall be used to determine the magnitude of employee noise exposure.

The project owner shall prepare a report of the survey results and, if necessary, identify proposed mitigation measures to be employed in order to comply with the applicable California and federal regulations.

Verification: Within 30 days after completing the survey, the project owner shall submit the noise survey report to the CPM. The project owner shall make the report available to OSHA and Cal-OSHA upon request.

CONSTRUCTION RESTRICTIONS

NOISE-6 ~~Heavy~~ Noisy equipment operation and noisy construction work relating to any project features shall be restricted to the times delineated below, unless the CPM has provided permission allowing extension of these hours~~a special permit has been issued by the County of San Bernardino~~:

Mondays through Sundays: 7 a.m. to 7 p.m.

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.

[Rationale: Per discussions at the SA Public Workshop on April 6, 2010, Applicant inquired whether a county permit would be needed if the CEC is the lead agency, and for clarification that control and compliance would be with the CEC. The CEC agreed to reexamine whether a special county permit would be required and clarify their authority.
Additionally, the Applicant would like flexibility to conduct concrete work in the warmer temperature months earlier than 7 a.m. to ensure the quality of materials placed meet standards and best practices, and ability for heavy equipment activities for earthmoving months to begin at 5 am to perform routine maintenance on equipment.]

Verification: Prior to ground disturbance, the project owner shall transmit to the CPM a statement acknowledging that the above restrictions will be observed throughout the construction of the project.

CONSTRUCTION RESTRICTIONS

NOISE-7 If a traditional, high-pressure steam blow process is used, the project owner shall monitor sound at the closest receptor, LT-1, to ensure the noise of steam blows do not exceed 89 DB. If this noise level is unattainable, the project owner shall either relocate the residents for the duration of steam blows in proximity of LT-1, or equip steam blow piping with a temporary silencer that quiets the noise of steam blows to no greater than 89 dBA measured at ~~a distance of 100 feet~~the closest noise receptor. The steam blows shall be conducted between ~~8~~7:00 a.m. and ~~5~~7:00 p.m. unless arranged with the CPM such that offsite impacts would not cause annoyance to noise receptors. If a low-pressure, continuous steam blow process is used, the project owner shall submit to the CPM a description of the process, with expected noise levels and planned hours of steam blow operation.

[Rationale: The proposed times of operation are consistent with the County's noise exemption for construction. The "quieter steam blow process" described on p. 5.6-8 of the SA proposes continuous 36-hour operation, with a noise level of about 86 dBA at 50 feet, compared to a traditional steam blow with silencer with noise levels of 89 dBA at 50 feet. During the SA Public Workshop on April 6, 2010, the Applicant requested the restrictions placed to attain a 3 dB reduction be reexamined and the CEC agreed. The traditional steam blow was estimated to produce noise levels as high as 129 dBA at 50 feet, "roughly 96 dBA at LT-1." At what distance between the steam blow and LT-1 was the noise 96 dBA? Steam blows in proximity of LT-1 would occur for a limited time. It is possible that the steam blow with silencer reduces effectiveness of the steam blows. In order to allow the use of a traditional steam blow, Applicant proposes relocating the LT-1 residents during the steam blows that could result in noise levels exceeding 89 dB at this receptor.]

Verification: At least 15 days prior to the first steam blow, the project owner shall notify all residents and business owners within two miles of the project site. The notification may be in the form of letters, phone calls, fliers, or other effective means as approved by the CPM. The notification shall include a description of the purpose and nature of the steam blow(s), the planned schedule, expected sound levels, and explanation that it is a one-time activity and not part of normal plant operation.

SOIL AND WATER RESOURCES

Testimony of Christopher Dennis, P.G., John Fio, Gus Yates, P.G., C.H.g.,
And Mike Conway

SUMMARY OF CONCLUSIONS

Based on the assessment of the proposed Abengoa Mojave Solar (AMS) project, the California Energy Commission (Energy Commission) staff finds that:

- The proposed use of groundwater for industrial cooling would not significantly impact groundwater levels in the Harper Valley Groundwater Basin (HVGB), the basin balance, or quality of groundwater in the basin. Staff has proposed Condition of Certification **SOIL&WATER-6** to establish pre-construction and project related groundwater quality and groundwater elevation levels that can be quantitatively compared against observed and simulated levels near the project pumping wells and near potentially impacted existing wells, and to avoid, minimize, or mitigate impacts to the Harper Lake marsh from potential reduction or degradation in the quantity or quality of groundwater conveyed to the Harper Lake marsh.
- The proposed method of sanitary wastewater disposal by a septic system and leach field would have no significant impacts provided the requirements of Condition of Certification **SOIL&WATER-8** are met.
- The proposed project will not significantly increase or decrease erosion rates within its watershed, if Condition of Certification **SOIL&WATER-1** and **-2** are implemented as proposed during construction and operation. Staff are currently working with the Lahontan Regional Water Quality Control Board (RWQCB) to develop additional requirements that will be included in the Supplemental Staff Assessment as a part of Condition of Certification **SOIL&WATER-2**. Using these protective measures, the natural processes of erosion due to wind and water would not be significantly affected during either project construction or operation.
- Staff is awaiting submittal of the storm water surface profile analysis for flows in the main storm water diversion channel to complete analysis of the drainage design and potential flooding off-site in the Supplemental Staff Assessment.
- Staff is awaiting information from the applicant needed to address San Bernardino County's concerns and comments documented in their letter dated 2/1/2010, and discussed below under 'Response to Agency Comments'.
- The proposed on-site drainage management design would perform adequately and any potential impacts would be mitigated if Condition of Certification **SOIL&WATER-1** and **-3** are implemented as proposed.
- Requirements for mitigation of discharges of Heat Transfer Fluid (HTF) to a land treatment unit, brines to evaporation ponds, and stormwater are currently under development and completion of these requirements is contingent upon the submittal of additional information from the applicant. These requirements will be included in Condition of Certification **SOIL & WATER - 2**.
- Based on the elements of the proposed project submitted by the applicant to date, ~~and with the exception of the applicant's proposed use of groundwater for wet~~

~~cooling purposes and of evaporation ponds for wastewater disposal (as discussed further below),~~ staff believes the project would comply with all applicable federal, state, and local laws, ordinances, rules, and standards (LORS) with the adoption of the recommended conditions of certification.

[Rationale for Edits: While the project complies with LORS without any conservation proposal, this mitigation provides additional assurance of compliance.]

- Based on the elements of the proposed project submitted by the applicant to date, staff believes that construction and operation of the project would not result in immitigable project-specific direct or indirect or cumulative significant impacts to soil or water resources with the adoption of the recommended conditions of certification.
- The applicant has proposed to use brackish groundwater for wet cooling when other cooling ~~feasible~~ technologies ~~are available~~exist. Staff believes the proposed use of groundwater for wet cooling will~~ould not~~ comply with the state's water policies and~~with~~ ~~. To address this inconsistency with state water policy, staff recommends~~the implementation of Condition of Certification **SOIL&WATER-9** consistent with Applicant's proposed water conservation plan ~~that would require the project owner~~ to reduce the proposed water use provides additional assurance of compliance. ~~through a project design change(s) and/or through a water conservation program.~~
- The applicant has proposed the use of evaporation ponds as the preferred method of wastewater disposal. Staff believes potential impacts related to the use of evaporation ponds to dispose of the industrial wastewater could be mitigated through effective application of state and local LORS. ~~However, t~~This method of wastewater disposal is ~~not~~ consistent with the Energy Commission's policy that encourages the use of zero liquid discharge (ZLD) systems that are designed to eliminate wastewater discharge and inherently conserve water, and offers the additional benefit of energy conservation, because instead of a crystallizer, the evaporation ponds employ the sun to evaporate the water. Therefore, staff finds that this method of wastewater disposal does ~~not~~ comply with the state's water policies. ~~As discussed above, to resolve this impact, staff recommends implementation of Condition of Certification **SOIL&WATER-9**.~~

The state has expressed a strong interest in developing its solar energy resources. However, the construction and operation of solar energy facilities requires the use of water, which state policy also protects. The Energy Commission must balance the state's interest in promoting solar energy development with its interest in conserving and protecting the state's water resources. Several projects currently proposed for the Mojave and Colorado deserts would use water for power plant cooling, which staff believes is contrary to the state's long term interest in maximizing solar power generation and minimizing adverse environmental impacts. This will be an especially critical issue in the renewable development areas that will be identified in the Desert Renewable Energy Conservation Plan (DRECP). Later this year, staff plans to file a request for an Order Instituting an Informational Proceeding to address this issue.

Completion of staff's analysis of the proposed project is subject to the following:

aquifer, estimated from well tests, ranges from 100,000 to 300,000 gallons per day per foot (gpd/ft) (AS2009a). Groundwater in the vicinity of the proposed project contains varying concentrations of sodium, chloride, bicarbonate, sulfate, boron, and Total Dissolved Solids (TDS) (DWR2003).

The upper aquifer is approximately 300 to 400 feet thick and overlays the laterally extensive Black Mountain Basalt (MG1989). This Pleistocene basalt flow originated from Black Mountain and is approximately 200 feet thick beneath the AMS project site and confines to semi-confines the aquifer beneath it (MG1989; AS2009a). Most of the groundwater wells in the vicinity of the AMS project appear to be completed to depths above the basalt layer (MG1989), with an average well depth of approximately 365 feet bgs. Beneath the AMS project site, the aquifer below the basalt layer (lQal) appears to extend to the bedrock at approximately 950 feet bgs (MG1989).

Under pre-development conditions (prior to the 1930s), groundwater discharged to Harper Lake (USGS2001; CSUF2007). However, as agricultural use of the land developed, the groundwater elevation lowered due to pumping and consumption from storage to such a degree that discharge from the regional aquifer to the lakebed no longer occurs. Now, perched water conditions generally exist at approximately 27 to 33 feet bgs near Harper Lake (USGS2001; AS2009a). A perched water condition occurs when water in the ground is retained by an underlying low permeability strata that separates that water from a deeper aquifer.

Precipitation and groundwater underflow supply water to the basin. Recharge from precipitation is considered negligible in the USGS numerical model (USGS2001). Direct recharge from rainfall to the valley floor and surrounding low hills is substantially less than the potential rate of evapotranspiration and potential for soil moisture retention. When runoff or precipitation does reach the dry lake, infiltration to groundwater is negligible and most of the water is removed by evaporation (Hogan2004; USGS2001).

The Mojave River and its tributaries supply groundwater to the Mojave Basin area. Due to continued overdraft, the Mojave Basin area was adjudicated (MBAA1996). For purposes of administration of the judgment, the Mojave Basin area was divided into five separate hydrologic subareas: Este (East Basin), Oeste (West Basin), Alto (Upper Basin), Centro (Middle Basin) and Baja (Lower Basin) (MBAA1996). The proposed AMS project, the Harper Lake model zone, and HVGB are all located in the adjudication's Centro subarea.

The adjudication also states there is a need to conserve water and make the maximum beneficial use of the water resources in the state (MBAA1996).

Under the Porter-Cologne Water Quality Act (Water Code Sec 13000 et seq.), each regional water quality control board is required to develop a basin plan that defines and protects the beneficial uses of water in all basins within a region. The beneficial uses of the surface water and groundwater in Harper Valley were defined in the 2005 *Water Quality Control Plan for the Lahontan Region, North and South Basins* (the Basin Plan). The beneficial use designations for surface water and groundwater in Harper Valley~~, which are most applicable to the AMS project~~, are presented below in **Soil & Water**

Table 2. The project's proposed water use is an industrial service supply use and is consistent with the designated beneficial uses.

[Rationale for Edits: Beneficial use designations in the Basin Plan are used to determine the level of water quality necessary to ensure the reasonable protection of beneficial uses. See Water Code § 13241. The project's proposed water use falls within one of the Basin Plan designated beneficial uses. It does not make sense to state that the beneficial use designations are "most applicable to the AMS project." There is no evidence that the project's proposed water use adversely impacts designated beneficial uses within the Harper Valley.]

The Basin Plan gives equal priority to each beneficial use of the surface water and groundwater. Included in the definition of surface water are playas and ephemeral washes. As presented in the table above, the desert washes provide beneficial functions and values such as groundwater recharge, flood peak attenuation and floodwater storage, and wildlife habitat. In the vicinity of the AMS project site are wetlands that are maintained by the Federal Bureau of Land Management (BLM). Consistent with a Condition of Certification for the neighboring SEGS plants, ~~U~~up to 75 acre-feet per year (AF/y) of groundwater is pumped to Harper Lake to maintain water levels in the wetlands by a well located on the proposed AMS project site. This well is located within the proposed solar field and is expected to be properly abandoned by the project owner. A new well is expected to be installed by the BLM on land adjacent to the project site near the wetlands. The existing well would not be abandoned until the new well is functional and used as the new wetlands water supply well. Please refer to the **BIOLOGICAL RESOURCES** section for additional discussion regarding the wetlands water supply.

PROPOSED PROJECT DESCRIPTION

The AMS project would be a 250-MW capacity solar electric generating system that would consist of rows of parabolic mirrors (collectors) that would heat a fluid (~~t~~Therminol or similar) inside piping placed at the focal point of each mirror row (AS2009a). The hot therminol would pass through a series of coils to boil water and create steam for a steam turbine generator. The solar field would be kept free of vegetation by hand pulling or the use of spot spraying of commercially available herbicides (AS2009a). The potential for wind erosion would be minimized by the use of dust palliatives (AS2009a). Mirror washing would be conducted at regular intervals. Operation of the project would require 63 fulltime and 10 seasonal employees (AS2009a).

Construction of the proposed power plant would involve approximately 1,765 acres (2.8 square miles) in an unincorporated portion of San Bernardino County (AS2009a). The project would be divided into two nearly identical, independently-operable, solar fields and power blocks (alpha and beta), each connected to a shared electrical transmission line interconnection substation (AS2009a). Each power block would have a 125-MW capacity, with the alpha plant occupying approximately 884 acres and the beta plant occupying approximately 800 acres (AS2009a). Approximately 81 acres would be used by both plants for managing storm water flowing to the project site and redirecting that flow to Harper Lake (AS2009a). In addition, each power block would have its own water treatment unit, evaporation ponds, therminol (heat transfer fluid) bioremediation unit, and natural-gas powered auxiliary boiler to prevent freezing of the therminol[3] (AS2009a). Construction of the AMS project is estimated to take 26 months, with an average workforce of 830 persons and a peak workforce of 1,162 persons (AS2009a).

Soil Erosion and Storm Water Control

The project proposes to manage stormwater in accordance with site-specific grading plans, a construction Storm Water Pollution Prevention plan (SWPPP), a Drainage Erosion and Sediment Control Plan (DESCP), and in accordance with the San

[3] Therminol freezes at 54^{o}F (AS2009a).

Bernardino County ordinances. These plans and ordinances would establish methods of when and how to control and manage storm water flow as it reaches, flows across, and then leaves AMS.

Water Supply and Use

Groundwater from the upper (uQal) aquifer would supply all proposed water uses at the AMS project (AS2009a). Four new wells are proposed to supply water for both construction[4] and operation of the project (AS2009a). Each of the two solar plants would have its own production well and a backup well. Each power block would also have a dedicated water treatment unit for plant process needs and a packaged treatment unit for potable water (AS2009a). Well installation would occur prior to the beginning of construction to support grading and other construction water needs (AS2009a).

Wastewater Management

Hydrostatic Test Water

An estimated 1.2 acre-feet of hydrostatic test water would be used for pressure testing the AMS project's piping and vessels (AS2009b). Depending on analysis of the water, the hydrostatic test water would either be trucked to a wastewater treatment facility or discharged to land where it would infiltrate the soil or evaporate (AS2009a).

Sanitary Waste

Sanitary waste would be contained in portable facilities during construction and routinely disposed of at a local treatment facility (AS2009a). During plant operation, sanitary waste at each power block would be disposed of through a septic and leach field system (AS2009a). Approximately 1,250 gallons per day (gpd) of wastewater would be disposed of through each septic system (AS2009a).

Process Wastewater

Process wastewater would be generated from cooling tower blowdown, chemical feed area, and general plant drains at each power block (AS2009a). The cooling tower blowdown would be processed by clarification, reverse osmosis (RO), a demineralizer system, and other treatment systems before being used for mirror washing and reused as steam system makeup water (AS2009a). Reject water from this treatment process at each power block would be discharged to ~~four~~ two ~~10~~5-acre, double-lined evaporation ponds (AS2009a). The evaporation ponds would be sized to retain all solids generated by the evaporation of the wastewater during the life of the project (AS2009a).

Wastewater from the chemical feed area and general plant drains would be processed through an oil/water separator (AS2009a). The separated oil and sludge would be containerized and transported to an off-site oil recycling facility. The remaining wastewater would be pumped to the plant's evaporation ponds (AS2009a).

[4] As an additional supply of construction water, the existing on-site Ryken well would be used during construction only (AS2009b).

Given the low frequency of precipitation and storm water runoff, BMPs proposed by the applicant should limit potential soil loss from water erosion caused by on-site precipitation events. BMPs would be applied and erosion and sedimentation control measures repaired as soon as erosion is evident. Temporary erosion control measures would be implemented as needed to control erosion during both construction and operation. Temporary sediment control materials would be maintained on-site throughout the life of the project to respond as needed to unforeseen rain or emergencies. With implementation of BMPs identified by the applicant in the AFC and proposed in Condition of Certification **SOIL&WATER-1**, significant soil erosion and subsequent sedimentation would be avoided. Overall, staff believes the applicant has identified a reasonable plan and sequence for implementing BMPs in the DESCP that would avoid significant adverse erosion and sedimentation impacts resulting from precipitation runoff. Staff concludes that through the proper application of BMPs as proposed by these conditions of certification, the impact to soil resources from water and wind erosion during construction would be reduced to a level that is less than significant.

High winds during grading and excavation activities can result in wind borne erosion leading to increased particulate emissions that adversely impact air quality. The implementation of appropriate erosion control measures would help conserve soil resources, protect downstream properties and resources, and protect air quality. Conditions of Certification in the **AIR QUALITY** section require a construction mitigation plan to prevent significant impacts from fugitive dust and wind erosion during construction. ~~These prevention measures include: employing an on-site mitigation manager, limiting vehicle speed to five miles per hour during construction; requiring all unpaved roads and disturbed areas and linear construction sites to be watered as frequently as necessary during grading and stabilized thereafter with a non-toxic soil stabilizer or soil weighting agent to comply with the dust mitigation objectives; and establish performance standards for controlling fugitive dust and requirements for response should they be exceeded.~~Please refer to the AIR QUALITY section for details on the required elements of these prevention measures. The requirement to use soil weighting and bonding agents following grading would conserve freshwater by reducing the need for water as a means to control fugitive dust.

[*Rationale for Edits: Some of the described prevention measures are not consistent with the AIR QUALITY section, such as limiting vehicle speed to 5 mph. Proposed Condition of Certification AQ-SC-3 provides "No vehicle shall exceed 10 miles per hour on unpaved areas within the construction site, with the exception that vehicles may travel up to 25 miles per hour on stabilized unpaved roads as long as such speeds do not create visible dust emissions."*]

The applicant has also proposed permanent wind erosion control measures to mitigate potential erosion and subsequent fugitive dust impacts resulting from prevailing winds during construction and operation of AMS project. During operation, areas not covered by foundations, paving, or the solar array would be treated with soil stabilizers. The AMS project is expected to minimize wind erosion in an effort to protect the mirrors and minimize maintenance and damage. Erosion control measures would be required by staff in Condition of Certification **SOIL&WATER-1**. With implementation of the

by the project applicant show that the project's groundwater pumping would induce the lateral movement of groundwater from beneath the Harper (dry) Lake towards the project's water supply wells, however, the time of travel is likely on the order of 50 to 100 years.

Analyses of groundwater movement and quality provide differing results. Modeling results prepared by the project applicant show that the project's groundwater pumping would likely, over time, induce the lateral movement of poorer quality groundwater from the Harper Lake area towards the project's water supply wells. In contrast, historical data, while limited, demonstrates that groundwater has been pumped from site wells for decades. When the agricultural demand for water was at its peak, this demand was about five times greater than the proposed groundwater use for the AMS project. However, even with the historical pumping, it does not appear that groundwater produced by the Ryken well decreased in quality as a result of groundwater movement from beneath Harper (dry) Lake. It is possible that travel times from beneath the lakebed to adjacent wells are so long an impact has not yet been detected. Alternatively, groundwater in the main aquifer beneath the playa may not be sufficiently degraded to impact adjacent wells.

Staff concludes there is no evidence to confirm that a water quality impact to the existing BLM marsh water supply well would occur from proposed AMS project pumping. To ensure no impacts to groundwater quality in the existing BLM marsh water supply well occur, Condition of Certification **SOIL&WATER-6** requires that the project establish a baseline of water quality in the BLM well and collect water samples semi-annually and report the results semi-annually to the Energy Commission and BLM. If marsh water-supply well has been impacted by project pumping and the water supply quality deteriorated (exceeds pre-project constituent concentrations in TDS, sodium, or selenium concentrations) for three consecutive years, Condition of Certification **SOIL&WATER-6** would require the project to provide treatment or a new water supply to either meet or exceed pre-project water quality conditions if it is established that such water quality would adversely affect the marsh.

Staff is concerned that the current BLM well may be constructed such that its filter pack and screen intercepts both poor quality shallow perched water and the better quality upper aquifer groundwater (uQal). A well constructed in this manner allows poor quality perched water to mix with the better quality aquifer water and degrade the quality of water in the well. Staff recommends that any well used to supply water to the marsh be constructed or retrofitted to prevent low quality perched water from entering the well and upper aquifer. Staff believes the existing Ryken well should either be abandoned or modified to prevent flow from the perched aquifer to mitigate this impact. In addition, if the perched aquifer is present in the areas where the new project wells are proposed, the well should be constructed so these flows are prevented and potential impacts are mitigated. Staff recommends the applicant be required to comply with Condition of Certification **SOIL&WATER-4** to ensure the Ryken well is abandoned properly and new wells are constructed so that water quality impacts are mitigated to a level that is less than significant.

60 acre-feet per year of storage from the rest of the Centro subarea. The simulated pumping increase is over nine times greater than the foreseeable increase in groundwater use. Assuming the storage change reduction is proportional to the pumping, the estimated 60 acre-feet per year increase in pumping may remove an additional 54 and 6.7 AF/y of groundwater from storage in these two areas, respectively (one-ninth of 490 and 60 acre-feet per year, respectively). Staff believes these amounts are minor and impacts to the basin balance from the foreseeable pumping would be less than significant.

COMPLIANCE WITH FEDERAL, STATE, AND LOCAL LORS

The Energy Commission has five sources for statements of policy relating to water use in California applicable to power plants. They are the California Constitution, the Warren-Alquist Act, the Commission's restatement of the State's water policy in the 2003 Integrated Energy Policy Report ("IEPR"), the State Water Resources Control Board ("SWRCB" or "Board") resolutions (in particular Resolutions 75-58 and 88-63), and the Genesis Solar Project Committee's water-issues order as guidance for interpreting all of the above.

LORS AND STATE POLICY AND GUIDANCE

California Constitution

Article X, section 2 prohibits the waste or unreasonable use, including unreasonable method of use, of water, and it requires conservation of such waters be exercised with a view to the reasonable and beneficial use thereof in the interest of the people and for the public welfare~~all water users to conserve and reuse available water supplies to the maximum extent possible~~ (Cal. Const., art. X, § 2). Groundwater is subject to reasonable use (*Katz v. Walkinshaw* (1903) 141 Cal. 116).

Warren-Alquist Act

Section 25008 of the Energy Commission's enabling statutes echoes the Constitutional concern, by promoting "all feasible means" of water conservation and "all feasible uses" of alternative water supply sources (Pub. Resources Code § 25008).

Integrated Energy Policy Report

In the 2003 Integrated Energy Policy Report (IEPR or Report), the Energy Commission reiterated certain principles from SWRCB's Resolution 75-58, discussed below, and clarified how they would be used to discourage use of fresh water for cooling power plants under the Commission's jurisdiction. The Report states that the Commission will approve the use of fresh water for cooling purposes only where alternative water supply sources or alternative cooling technologies are shown to be ‘‘environmentally undesirable" or "economically unsound" (IEPR (2003), p. 41). In the Report, the Commission interpreted "environmentally undesirable" as equivalent to a "significant adverse environmental impact" under CEQA, and "economically unsound" as meaning "economically or otherwise infeasible," also under CEQA (IEPR, p. 41). CEQA and the Commission's siting regulations define feasible as "capable of being accomplished in a successful manner within a reasonable amount of time," taking into account economic and other factors (Cal. Code Regs., tit. 14, § 15364; tit. 20, § 1702, subd. (f)). At the

time of publication in 2003, dry cooling was already feasible for three projects—two in operation and one just permitted (IEPR, p. 39).

The Report also notes California's exploding population, estimated to reach more than 47 million by 2020, a population that will continue to use "increasing quantities of fresh water at rates that cannot be sustained" (IEPR, p. 39).

State Water Resources Control Board Resolutions

The SWRCB adopts state water quality control policies.~~not only considers quantity of water in its resolutions, but also the quality of water.~~ In 1975, the Board adopted the *Water Quality Control Policy on the Use and Disposal of Inland Waters Used for Power Plant Cooling* (Resolution 75-58). In it, the Board encourages the use of wastewater for power plant cooling. It also determined that inland waters which are suitable for use as a source of domestic, municipal, or agricultural water supply and which provide habitat for fish and wildlife are fresh water, and that waters with a salinity range ~~with a TDS concentration~~ of 1,000 mg/L to 30,000 mg/L~~or less~~ is brackish water~~ should be considered fresh wate~~r (Resolution 75-58). One express purpose of that Resolution was to "keep the consumptive use of fresh water for power plant cooling to that *minimally essential*" for the welfare of the state (*Ibid*; emphasis added).

In 1988, the Board determined that water with TDS concentrations of 3,000 mg/L or less should be protected for and considered as potential supplies for municipal or domestic use unless otherwise designated by one of the Regional Water Quality Control Boards (Resolution 88-63).

Order from the Genesis Solar Project Committee

The Genesis Solar Project Committee considered all these sources of policy to arrive at a simple yet flexible determination for water use by power plants under Commission jurisdiction. The Order states:

> The Committee reads [the policies] as requiring projects seeking to use groundwater for power plant cooling to use the least amount of the worst available water, considering all applicable technical, legal, economic, and environmental factors (Genesis Solar Energy Project Committee, Decision and Scoping Order, Feb. 2, 2010).

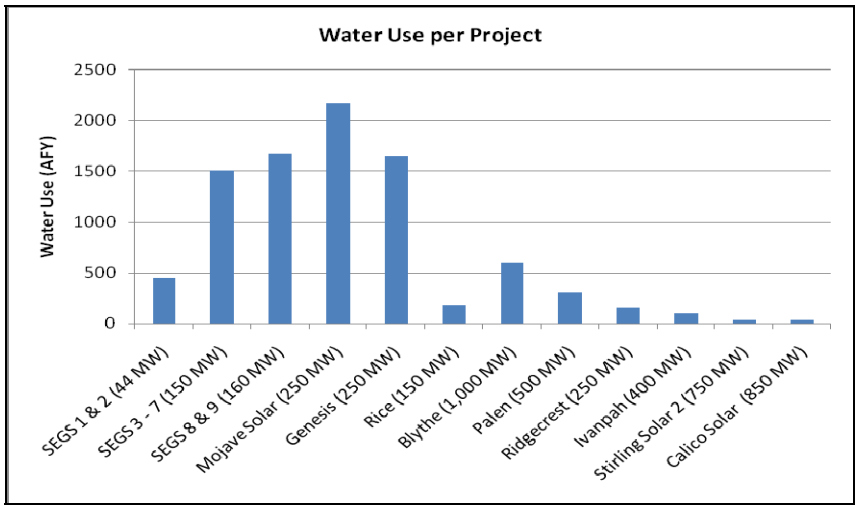
Staff carefully considers all relevant factors when conducting analysis and arriving at recommendations for the Commission. Thus, staff must determine what is the least but nevertheless feasible amount of water available for use, and also the worst, feasible available water that applicant could use for particular purposes on a project.

In several cases, the Commission has accepted conservation programs that conserve water in the region as means of accepting compliance with the water policies. Staff takes this to mean that such conservation programs are an acceptable method to ensure compliance for current projects.

PROPOSED USE OF GROUNDWATER PUMPING AND WET-COOLING BY THE AMS PROJECT

The AMS project proposes a wet-cooled facility that would use a maximum of 2160 AF/y of groundwater from on-site wells. The Harper Valley Groundwater Basin is the primary natural water supply for the project area. Pumped water would be used for various purposes besides cooling, including domestic use by workers, dust suppression, and mirror washing. Water is the only feasible means of cleaning the mirrors, which must be clean to maintain efficiency of output by parabolic trough solar plants. Cooling tower blowdown would be processed before being used for mirror washing and reused as steam system makeup water. Reject water from the treatment process would be discharged to evaporation ponds. Overall maximum proposed use of the water would be ~~inefficient for this~~comparable to that actually used at existing SEGS VIII and IX facilities ~~technology~~, requiring a maximum of 865 AF/y per 100 MW of capacity, or up to 3.30~~6~~ acre-~~-~~feet per gigawatt (GW)-~~-~~hour generated. The **Soil & Water Graph 4** presented below shows the water use between the various solar plants currently licensed by the Energy Commission or in the licensing process.

Soil & Water Graph 4
Water Use Per Project

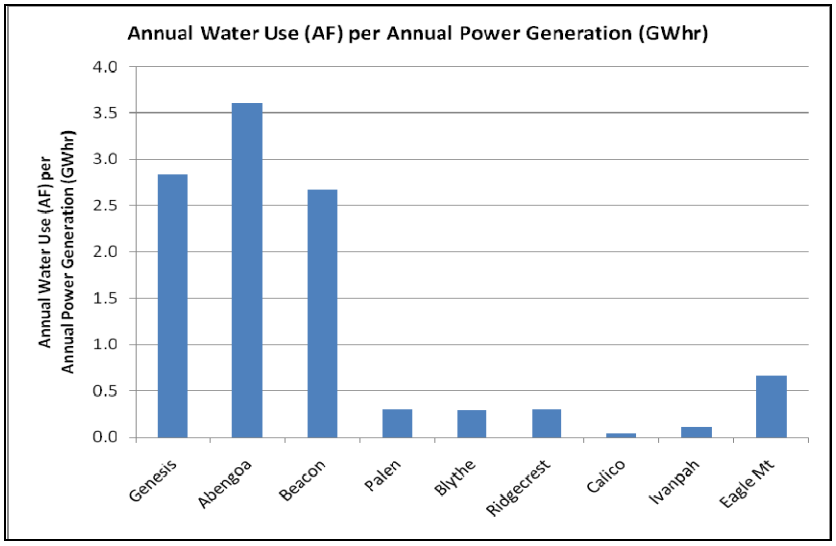


Source: CEC2010.

The **Soil & Water Graph 5** below presents the water use per GW hour between various existing and proposed solar and pumped storage plants ~~proposed to be built~~ in the desert region.

[***Request: Please add SEGS to graph for comparison with actual operating plants***.]

Soil & Water Graph 5
Water Use Per Project Per Gwhr



Source: CEC2010

The quality of groundwater applicant proposes to use would also likely classify as a potential drinking water source because it meets the criteria identified in SWRCB Resolution 88-63. The quality of groundwater the AMS project proposes to use is slightly impaired but well below the policy guidance of 3,000 mg/L TDS for evaluating an aquifer as a potential drinking water source. Use of worse-quality water or reclaimed water appears infeasible ~~at this time~~.

The Drinking Water Standards found in Title 22 of the California Code of Regulations provide maximum contaminant levels (MCL) which are applied to determine the acceptability of water for delivery to the public. As discussed in the groundwater quality section of the AFC, the project proposes to use groundwater with a TDS of approximately 1,200 to 1,500 mg/L. This TDS level is above the recommended limit of 500 mg/L and slightly above the secondary maximum contaminant level (MCL) for TDS in drinking water of 1,000 mg/L. Secondary MCLs are based on aesthetics and intended to protect odor, taste and appearance. A water supply with TDS concentrations exceeding the secondary MCL could not be provided to the public by community water systems. Staff notes that the current anticipated water quality only slightly exceeds the secondary MCL and believes with limited treatment could be developed as a municipal supply provided it could be developed within practical constraints such as treatment and distribution and legal constraints imposed by the adjudication.

The use of groundwater for wet cooling compounds the environmental concerns because the applicant proposes to use evaporation ponds for disposal of the wastewater generated by the wet cooling process. Potential impacts from the use of evaporation ponds could be mitigated consistent with state and local LORS. ~~However, t~~This method of wastewater disposal is ~~not~~ consistent with the Energy Commission's policy that encourages the use of ZLD systems that are designed to eliminate wastewater discharge and inherently conserve water and offers the additional benefit of energy conservation, because instead of a crystallizer, the evaporation ponds employ the sun to evaporate the water. Therefore, staff finds this method of wastewater disposal does ~~not~~ comply with the state's water policies.

Staff concludes that the Abengoa project, as proposed by applicant, does ~~not~~ comply with the State's water policies as detailed above. ~~While t~~The applicant ~~does~~ proposes to recycle ~~some~~ most water 38 times., ~~the project could feasibly use significantly less water.~~ In addition~~Therefore~~, staff recommends that the Commission adopt a Condition of Certification ~~that requires the applicant to submit a~~ consistent with the Water Conservation Plan proposed by the Applicant ~~that outlines the actions necessary to bring the project cooling water use into compliance with the water policies~~. ~~Staff would like to work with t~~The applicant ~~between the publication of this SA and the SSA to develop the details of the~~has proposed a Water Conservation Plan that entails sequestering an amount of its water rights in the Mojave River Area on an annual basis for the life of the project equal to the amount of water withdrawn. During typical years this is expected to be approximately 1,700 AF/y, for which the Applicant owns sufficient water rights.

~~. Specific options we would like to explore include:~~

~~1. Dry-cooling or hybrid cooling systems;~~

~~2. Use of a ZLD system;~~

~~Increase water use efficiency through project design changes such as increasing cycles of concentration for the evaporative cooling processes;~~

~~Purchase and retire agricultural groundwater pumping rights in the Mojave River Area, including those held by the applicant;~~

~~Provide funding for the Mojave Water Agency's Water Conservation Incentive Program and/or Regional Recharge and Recovery Program;~~

~~Funding of Tamarisk removal; and,~~

~~Other water conserving activities in the Mojave River area.~~

~~After exploring these options, as well as any others the applicant would like to consider, staff will draft a Condition of Certification that identifies the types of activities the applicant could take to ensure the project's conformity with state water policy. The condition could require the Water Conservation Plan to identify the details and descriptions of these activities, including:~~

~~A. Feasibility studies and costs;~~

~~B. Identification of the activity and water source, and the quantity of basin water that would be conserved;~~

~~C. Demonstration of the project owner's legal entitlement to the water or ability to conduct the activity;~~

~~D. Discussion of whether any agency, non-government organization, or private property right holders approval of the identified activities will be needed, and, if so, whether additional approval will require compliance with CEQA;~~

~~E. Demonstration of how groundwater will be replaced for each of the activities;~~

~~F. An estimated schedule for completion of the activities;~~

~~G. Performance measures that would be used to evaluate the amount of water replaced by the activities; and~~

~~H. Monitoring and Reporting Plan outlining the steps necessary and proposed frequency of reporting to show the activities are achieving the intended conservation.~~

NOTEWORTHY PUBLIC BENEFITS

Staff has not identified any noteworthy public benefits of the proposed project that are associated with soil and water resources.

[Request: Please add discussion of benefits of the project regarding proposed water use as compared to historical agriculture. Please refer to AFC at page 5.17-1 for specific per acre water use comparisons between the Applicant's proposed water use and historical agricultural use in the area.
Please also consider the addition of decreased soil erosion due to increased soil stabilization from the project's proposed mitigation measures.]

RESPONSE TO AGENCY AND PUBLIC COMMENTS

Staff received comments from the County of San Bernardino and the public regarding soil and water resources.

SAN BERNARDINO COUNTY

San Bernardino County made general and specific comments regarding the proposed AMS project. Staff has reviewed these comments and incorporated these comments into this analysis. In addition, conditions of certification in this section require the project to submit various plans, such as grading plans and groundwater monitoring plans, to the County for review and comment prior to approval of these plans by the Energy Commission. Several of the County's concerns regarding grading, drainage, and storm water control would be addressed in detailed a DESCP and SWPPP that would be submitted to the County pursuant to Conditions of Certification **SOIL&WATER-1** and **-2**. Concerns by the County regarding the project's proposed water use have been addressed in this document and in the AFC submitted by the applicant. Conditions of Certification **SOIL&WATER-4** through **-6** specifically addresses the applicant's proposed water use and require the project to develop an ongoing groundwater level and quality monitoring plan. Specific comments by the County regarding storm water and drainage have not been responded to by the applicant and are discussed below.

Comment: There is potential increase of storm water flow at the intersection of Hoffman Road and Harper Lake Road, where the drainage channel south of Hoffman Road transitions to a natural condition. Obtain drainage acceptance letters from all property owners adjacent to this intersection.

> Response: The applicant has not yet provided drainage acceptance letters from the property owners adjacent to this intersection.

Comment: The outlet structure at Harper Dry Lake is adjacent to a private property APN #0490-131-13. Adequate protection should be provided to prevent discharge from overflow onto this property.

Response: The applicant has not yet to provide a water surface profile analysis. This water surface profile is expected to compliment the Hydrology Study already provided by the Applicant in the AFC and address this concern about overflow onto this property.

Comment: Obtain approval from California Department of Fish & Game (CDFG), RWQCB, and USACE for concentrated discharge into Harper (dry) Lake.

Response: Staff is waiting for the applicant to submit information to the RWQCB in order for the RWQCB to review and comment on items such as discharge to Harper Lake. As discussed in the *Biological Resources – Construction Impacts to Jurisdictional Waters*, the CDFG jurisdictional waters at the AMS project discharge outlet to Harper Lake are considered and mitigated accordingly by Condition of Certification **BIO-16** in lieu of CDFG's section1600 permit. The USACE has made a determination to not exert jurisdiction over any portion of the proposed project (see *Biological Resources – Construction Impacts to Jurisdictional Waters*).

Comment: Proposed drainage channels shall be built outside the road right-of-way and maintained by the applicant.

Response: The applicant has not yet provided evidence that the proposed drainage channels would be built outside of right-of-ways. Drainage channels would be maintained through Condition of Certification **SOIL&WATER-3**.

Comment: Submit WQMP to Land Development Division for review and approval.

Response: A WQMP and the design standards contained within are neither necessary nor applicable to this project because the proposed project would not discharge to a water of the U.S. and is outside of the County's permitted Municipal Separate Storm Sewer System. All applicable storm water quality and quantity control measures would be addressed within Conditions of Certification **SOIL&WATER-1** and **-2**.

THE WILDLANDS CONSERVANCY

December 10, 2009

Comment: Will the wastewater in the evaporation ponds be heated or at ambient temperatures? Will the evaporations ponds be covered or open to avian wildlife? Where will the wastewater go and will it be recycled for use in the cooling towers?

Response: The temperature of the wastewater discharged in the evaporations ponds would be elevated (heated) with respect to ambient temperatures and allowed to equilibrate to ambient temperatures over time. The evaporation ponds would be netted to allow the wastewater to evaporate. Once the wastewater reaches the evaporations ponds, it would not be recycled. Before reaching the evaporation ponds, water in the cooling tower~~water blowdown~~ would be recycled approximately 5.8 times (CEC2010f). The cooling tower blowdown is recycled as

shown in the water balance submitted with the AFC. For additional information, please refer to the Report of Waste Discharge submitted by the applicant as part of the Supplemental Data Adequacy package.

DEFENDERS OF WILDLIFE

December 30, 2009

Comment: The proposed use of groundwater by the project would increase the rate of overdraft in the HVGB and would interfere with the BLM's marsh water supply well's ability to pump ground water to the marsh area.

Response: The project's proposed use of groundwater would exceed the operational yield of the Harper Lake groundwater model zone. Groundwater pumping by the project would also cause water levels to decrease in the BLM well. However, these impacts would be less than significant. For additional discussion on the basin balance and impacts to groundwater wells, please refer to the *Potential Project Impacts to Wells and the Basin Balance* section and Conditions of Certification **SOIL&WATER-6** and **BIO-20**.

Comment: The use of air-cooling technology in California deserts is technically and economically feasible. Four other projects in the California desert are proposing this technology. The use of such technology would result in a relatively minor impact to the overall steam turbine efficiency, which on the average, is 5% over a one-year cycle, and would conserve groundwater.

Response: Staff has evaluated the proposed use of groundwater in light of CEQA and the state's policies. While staff believe there would be no significant CEQA impacts from the use of groundwater, this use of groundwater does not comply with the state's policies. Staff has therefore recommended Condition of Certification **SOIL&WATER-9** to reduce the project's proposed water use through a project design change(s) and/or through a water conservation program.

CONCLUSIONS

Based on the assessment of the proposed AMS project, the Energy Commission staff finds that:

- The proposed use of groundwater for industrial cooling would not significantly impact groundwater levels in the HVGB, the basin balance, or quality of groundwater in the basin. Staff has proposed Condition of Certification **SOIL&WATER-6** to establish pre-construction and project related groundwater quality and groundwater elevation levels that can be quantitatively compared against observed and simulated levels near the project pumping wells and near potentially impacted existing wells, and to avoid, minimize, or mitigate impacts to the Harper Lake marsh from potential reduction or degradation in the quantity or quality of groundwater conveyed to the Harper Lake marsh.
- The proposed method of sanitary wastewater disposal by a septic system and leach field would have no significant impacts provided the requirements of Condition of Certification **SOIL&WATER-8** are met.

- The proposed project will not significantly increase or decrease erosion rates within its watershed, if Condition of Certification **SOIL&WATER-1** and **-2** are implemented as proposed during construction and operation. Staff are currently working with the RWQCB to develop additional requirements that will be included in the Supplemental Staff Assessment as a part of Condition of Certification **SOIL&WATER-2**. Using these protective measures, the natural processes of erosion due to wind and water would not be significantly affected during either project construction or operation.
- Staff is awaiting submittal of the storm water surface profile analysis for flows in the main storm water diversion channel to complete analysis of the drainage design and potential flooding off-site in the Supplemental Staff Assessment.
- Staff is awaiting information from the applicant needed to address San Bernardino County's concerns and comments documented in their letter dated 2/1/2010, and discussed below under 'Response to Agency Comments'.
- The proposed on-site drainage management design would perform adequately and any potential impacts would be mitigated if Condition of Certification **SOIL&WATER-1** and **-3** are implemented as proposed.
- Requirements for mitigation of discharges of HTF to a land treatment unit, brines to evaporation ponds, and stormwater are currently under development and completion of these requirements is contingent upon the submittal of additional information from the applicant. These requirements will be included in Condition of Certification **SOIL & WATER - 2**.
- Based on the elements of the proposed project submitted by the applicant to date, and with the exception of the applicant's proposed use of groundwater for wet cooling purposes and of evaporation ponds for wastewater disposal (as discussed further below), staff believes the project would comply with all applicable federal, state, and local laws, ordinances, rules, and standards (LORS) with the adoption of the recommended conditions of certification.
- Based on the elements of the proposed project submitted by the applicant to date, staff believes that construction and operation of the project would not result in immitigable project-specific direct or indirect or cumulative significant impacts to soil or water resources with the adoption of the recommended conditions of certification.
- The applicant has proposed to use groundwater for wet cooling when other ~~feasible~~ technologies exist~~are available~~. Staff believes that with the proposed water conservation plan, the proposed use of groundwater for wet cooling would ~~not~~ comply with the state's water policies. ~~To address this inconsistency with state water policy, s~~Staff recommends implementation of Condition of Certification **SOIL&WATER-9** consistent with the Applicant's proposed water conservation plan ~~that would require the project owner~~ to reduce the proposed water use in order to provide additional assurance of compliance. ~~through a project design change(s) and/or through a water conservation program~~.
- The applicant has proposed the use of evaporation ponds as the preferred method of wastewater disposal. Staff believes potential impacts related to the use of evaporation ponds to dispose of the industrial wastewater could be mitigated through effective application of state and local LORS. ~~However, t~~This method of

wastewater disposal is ~~not~~ consistent with the Energy Commission's policy that encourages the use of ZLD systems that are designed to eliminate wastewater discharge and inherently conserve water and offers the additional benefit of energy conservation, because instead of a crystallizer, the evaporation ponds employ the sun to evaporate the water. Therefore, staff finds that this method of wastewater disposal does ~~not~~ comply with the state's water policies. As discussed above, to resolve this impact, staff recommends implementation of Condition of Certification **SOIL&WATER-9**.

[Rationale for Edits: Evaporation ponds allow use of sun, rather than additional energy, to achieve the same purpose as a crystallizer, and effectively creates a ZLD facility.]

The state has expressed a strong interest in developing its solar energy resources. However, the construction and operation of solar energy facilities requires the use of water, which state policy also protects. The Energy Commission must balance the state's interest in promoting solar energy development with its interest in conserving and protecting the state's water resources. Several projects currently proposed for the Mojave and Colorado deserts would use water for power plant cooling, which staff believes is contrary to the state's long term interest in maximizing solar power generation and minimizing adverse environmental impacts. This will be an especially critical issue in the renewable development areas that will be identified in the DRECP. Later this year, staff plans to file a request for an Order Instituting an Informational Proceeding to address this issue.

Completion of staff's analysis of the proposed project is subject to the following:

- Submittal of the following to the RWQCB and County of San Bernardino for review and comment and to the Energy Commission for approval:

  A. Engineering design detail and vadose and groundwater monitoring plans for the four proposed wastewater evaporation ponds (surface impoundments);

  B. Location and construction details of proposed groundwater monitoring wells for the evaporation ponds;

  C. Engineering design detail and monitoring plans for the proposed HTF bioremediation units;

  D. Characterization of the anticipated waste streams proposed to be discharged into the evaporation ponds and bioremediation units;

  E. A description of the frequency and chemical analysis of waste and a plan that describes actions that will be taken in case of a detectable release;

  F. A closure plan for the evaporation ponds and bioremediation units; and

  G. Demonstration that the proposed project would be in compliance with RWQCB Order 2009-0009-DWQ Storm Water requirements that go into effect July 1, 2010.

3. As part of the AMS project Annual Compliance Report to the CPM, submit a Channel Maintenance Program Annual Report specifying which maintenance activities were completed during the year including type of work, location, and measure of the activity (e.g. cubic yards of sediment removed).

PROJECT GROUNDWATER WELLS

SOIL&WATER-4 Pre-Well Installation. The project owner shall construct and operate up to two on-site groundwater wells that produce water from the Harper Valley Groundwater Basin and two backup wells. The project owner shall ensure that the wells are completed in accordance with all applicable state and local water well construction requirements. If the perched water table is present where new wells ~~will~~s be constructed, the project wells shall be designed to prevent cross-connection between the lower quality perched groundwater and the upper aquifer. Prior to the start of well construction activities, the project owner shall submit for review and comment a well construction packet to the County of San Bernardino, in accordance with the County of San Bernardino Code Title 2, Division 3, Chapter 6, Article 5, containing the documentation, plans, and fees normally required for the county's well permit, with copies to the CPM. The project shall not construct a well or extract and use groundwater until the CPM provides approval to construct and operate the well.

Post-Well Installation. The project owner shall provide documentation to the CPM that the well has been properly completed. In accordance with California's Water Code section 13754, the driller of the well shall submit to the DWR a Well Completion Report for each well installed.

Groundwater Well Abandonment. On property controlled by the project owner, the project owner shall protect groundwater resources by abandoning all groundwater wells that are constructed in such a manner that the screen interval of the well intercepts both the poor quality perched water and deeper better quality aquifer water (uQal). These groundwater wells shall be abandoned in accordance with all applicable state and local water well abandonments requirements, including the California Department of Water Resources Bulletins 74-81 & 74-90. Prior to the start of well construction activities, the project owner shall submit for review and comment a well abandonment packet to the County of San Bernardino, in accordance with the County of San Bernardino Code Title 3, Division 3, Article 3, containing the

documentation, plans, and fees normally required for the county's well abandonment permit, with copies to the CPM. The project shall not abandon a well until the CPM provides approval.

Verification: The project owner shall ensure the Well Completion Reports are submitted and shall ensure compliance with all State and county water well standards and requirements for the life of the wells. The project owner shall do all of the following:

1. No later than 180 days prior to the construction of the on-site groundwater wells, the project owner shall submit a Groundwater Monitoring and Management Plan to the County of San Bernardino for review and comment (see Condition of Certification **SOIL&WATER-6**).

2. No later than sixty (60) days prior to the abandonment and construction of the on-site groundwater wells, the project owner shall submit to the CPM a copy of the water well abandonment and construction packet submitted to the County of San Bernardino for review and comment.

3. No later than thirty (30) days prior to the construction of the on-site water supply wells, the project owner shall submit a copy of any written comments received from the County of San Bernardino indicating whether the proposed well abandonment and construction activities comply with all county well requirements and meet the requirements established by the county's water well permit program.

4. No later than sixty (60) days after installation of each well at the project site, the project owner shall provide to the CPM copies of the Well Completion Reports submitted to the DWR by the well driller. The project owner shall submit to the CPM, together with the Well Completion Report, a copy of well drilling logs, water quality analyses, and any inspection reports.

5. During well construction and for the operational life of the well, the project owner shall submit two (2) copies to the CPM for review and approval any proposed well construction or operation changes.

6. The project owner shall provide the CPM with (2) two copies of all monitoring and other reports required for compliance with the County of San Bernardino water well standards and operation requirements.

7. No later than fifteen (15) days after completion of the on-site water supply wells, the project owner shall submit documentation to the CPM confirming that well drilling activities were conducted in compliance with Title 23, California Code of Regulations, Chapter 15, Discharges of Hazardous Wastes to Land, (23 CCR, sections 2510 et seq.) requirements and that any on-site drilling sumps used for project drilling activities were removed in compliance with 23 CCR section 2511(c).

CONSTRUCTION AND OPERATIONS WATER USE

SOIL&WATER-5 The proposed project's use of groundwater for all construction and operations activities shall not exceed 2,160 acre-feet per year. ~~Water quality used for project construction and operation will be reported in accordance with Condition of Certification **SOIL&WATER-6** to ensure compliance with this condition.~~ Prior to the use

of groundwater for construction, the project owner shall install and maintain metering devices as part of the water supply and distribution system to document project water use and to monitor and record in gallons per day the total volume(s) of water supplied to the project from this water source. The metering devices shall be operational for the life of the project.

[Rationale for Edits: The proposed Condition of Certification deals with a maximum quantity of water, so it is unclear why water quality would be reported to ensure compliance with this condition.]

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

At least sixty (60) days prior to the start of construction of the proposed project, the project owner shall submit to the CPM a copy of evidence that metering devices have been installed and are operational.

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

GROUNDWATER LEVEL AND QUALITY MONITORING AND REPORTING PLAN

SOIL&WATER-6 The project owner shall submit a Groundwater Level and Quality Monitoring and Reporting Plan to the CPM for review and approval. The Groundwater Level and Quality Monitoring and Reporting Plan shall provide a description of the methodology for monitoring background and site groundwater levels and quality. Prior to project construction, monitoring shall commence to establish pre-construction base-line groundwater level conditions and shall include pre-construction, construction, and project operation water use. A water quality baseline and groundwater level baseline shall be established for the Bureau of Land Management (BLM) marsh water supply well (the existing well and any retrofitted or newly installed well). The primary objectives for the monitoring is to ~~ensure the project uses a degraded water supply consistent with Condition of Certification~~ **~~SOIL & WATER– 5,~~** establish pre-construction and project related groundwater quality and groundwater elevation levels that can be quantitatively compared against observed and simulated levels near the project pumping well and near potentially impacted existing wells, and to avoid, minimize, or mitigate impacts to the Harper Lake marsh from potential reduction or degradation in the quantity or quality of groundwater conveyed to the Harper Lake marsh.

[*Rationale for Edits: SOIL&WATER-5 does not require the water supply to be of any particular water quality, so it is not clear why the primary objectives of water quality monitoring required by SOIL&WATER-6 would be consistency with SOIL&WATER-5.]*

Verification: The project owner shall complete the following:

1. At least six (6) weeks prior to construction, a Groundwater Level and Quality Monitoring and Reporting Plan shall be submitted to the CPM for review and approval before completion of Condition of Certification **SOIL& WATER-4**. The Plan shall include a scaled map showing the site and vicinity, existing well locations, and proposed monitoring locations (both existing wells and new monitoring wells proposed for construction). The map shall also include relevant natural and man-made features (existing and proposed as part of this project). The plan also shall provide: (1) well construction information and borehole lithology for each existing well proposed for use as a monitoring well; (2) description of proposed drilling and well installation methods; (3) proposed monitoring well design; and, (4) schedule for completion of the work.

2. At least four (4) weeks prior to construction, a Well Monitoring Installation and Groundwater Level Network Report shall be submitted to the CPM for review and approval. The report shall include a scaled map showing the final monitoring well network. It shall document the drilling methods employed, provide individual well construction as-builds, borehole lithology recorded from the drill cuttings, well development, and well survey results. The well survey shall measure the location and elevation of the top of the well casing and reference point for all water level measurements, and shall include the coordinate system and datum for the survey measurements. Additionally, the report shall describe the water level monitoring equipment employed in the wells and document their deployment and use.

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

4. At least four (4) weeks prior to project construction, all groundwater quality and groundwater level monitoring data shall be reported to the CPM. The report shall include the following:

    - An assessment of pre-project groundwater levels, a summary of available climatic information (monthly average temperature and rainfall records from the nearest weather station), and a comparison and assessment of water level data relative to the assumptions and spatial trends simulated by the applicant's groundwater model.
    - As assessment of pre-project groundwater quality with groundwater samples analyzed for TDS, chloride, nitrates, major cations and anions, and oxygen-18 and deuterium isotopes. These analyses, and particularly the stable isotope data, can be useful for identifying partially evaporated water sources and assessing their contributions to the quality of water produced by wells.
    - For the BLM marsh water supply well, at least two (2) groundwater samples shall be collected and analyzed for TDS, sodium, selenium, and oxygen-18 and

deuterium isotopes. These analyses, and particularly the stable isotope data, can be useful for identifying partially evaporated water sources and assessing their contributions to the quality of water produced by wells.

- The data shall be tabulated, summarized, and submitted to the CPM. The data summary shall include the estimated range (minimum and maximum values), average, and median for each constituent analyzed. The data shall also be analyzed using the Mann-Kendall test for trend to assess whether pre-project water quality trends, if any, are statistically significant.

5. During project construction and during project operations, the project owner shall semi-annually monitor the quality of groundwater and changes in groundwater elevation and submit data semi-annually to the CPM and BLM. The summary report shall document water level monitoring methods, the water level data, water level plots, and a comparison between pre- and post-project start-up water level trends as itemized below. The report shall also include a summary of actual water use conditions, monthly climatic information (temperature and rainfall), and a comparison and assessment of water level data relative to the assumptions and simulated spatial trends predicted by the applicant's groundwater model.

   - Groundwater samples from all wells in the monitoring well network shall be analyzed and reported semi-annually for TDS, chloride, nitrates, cations and anions, and oxygen-18 and deuterium isotopes. These analyses, and particularly the stable isotope data, can be useful for identifying partially evaporated water sources and assessing their contributions to the quality of water produced by wells.

   - Groundwater sample from the BLM marsh water supply well shall be analyzed for TDS, sodium, selenium, and oxygen-18 and deuterium isotopes. These analyses, and particularly the stable isotope data, can be useful for identifying partially evaporated water sources and assessing their contributions to the quality of water produced by wells.

   - Semi-annually, the marsh water-supply well compliance data shall be tabulated, summarized, and analyzed to compare water quality to pre-project conditions. For analysis purposes, pre-project water quality shall be defined by samples collected prior to project construction as specified above, and compliance data shall be defined by samples collected after the construction start date. The compliance data shall be analyzed for both trends and for contrast with the pre-project data.

     - Trends shall be analyzed using the Mann-Kendall test for trend. Trends in the compliance data shall be compared and contrasted to pre-project trends, if any.

     - If no significant trends exist in the compliance data, or the data set is insufficient to assess trends, all marsh water-supply well compliance data shall be pooled and contrast to the pre-project data set. If significant pre-project trends are identified, the compliance data can first be corrected to remove pre-project trends and then contrast to the pre-project data.

- The contrast between pre-project and compliance mean or median concentrations shall be compared using an Analysis of Variance (ANOVA). A parametric ANOVA (for example, an F-test) can be conducted on the two data sets if the residuals between observed and expected values are normally distributed and have equal variance, or the data can be transformed to an approximately normal distribution. If the data cannot be represented by a normal distribution, then a nonparametric ANOVA shall be conducted (for example, the Kruskal-Wallis test). If a statistically significant difference is identified between the two data sets, the monitoring data are inconsistent with random differences between the pre-project and baseline data indicating a significant water quality impact from project pumping may be occurring.
- If compliance data indicate the quality of the water produced by the marsh water-supply well has been impacted by project pumping, and the water supply quality has deteriorated (exceeds pre-project constituent concentrations in TDS, sodium, or selenium concentrations) for three consecutive years, the project owner shall provide treatment or a new water supply to either meet or exceed pre-project water quality conditions.

WASTEWATER COLLECTION SYSTEM REQUIREMENTS

SOIL&WATER-7 The project owner shall recycle and reuse all process wastewater streams to the extent practicable. Prior to transport and offsite disposal of any facility operation wastewaters that are not suitable for treatment and reuse on-site, the project owner shall test and classify the stored wastewater to determine proper management and disposal requirements. The project manager shall ensure that the wastewater is transported and disposed of in accordance with the wastewater's characteristics and classification and all applicable LORS (including any CCR Title 22 Hazardous Waste and Title 23 Waste Discharges to Land requirements).

Verification: Prior to transport and offsite disposal of any facility operation wastewaters that are not suitable for treatment and reuse on-site, the project owner shall test and classify the stored wastewater to determine proper management and disposal requirements. The project manager shall ensure that the wastewater is transported and disposed of in accordance with the wastewater's characteristics and classification and all applicable LORS (including any CCR Title 22 Hazardous Waste and Title 23 Waste Discharges to Land requirements).

SEPTIC SYSTEM AND LEACH FIELD REQUIREMENTS

SOIL&WATER-8 Prior to the start of construction of the sanitary waste system, the project owner shall submit to the County of San Bernardino for review and comment, and to the CPM for review and approval, plans for the construction and operation of the project's proposed sanitary waste septic system and leach field. These plans shall comply with the requirements set forth in County of San Bernardino Code Title 3, Division 3, Chapter 8, Waste Management, Article 5, Liquid Waste Disposal and Title 6, Division 3, Chapter 3, and the Uniform Plumbing Code. Project construction shall not proceed until the CPM has approved the plans. The project owner shall

remain in compliance with the San Bernardino County codes requirements for the life of the project.

Verification: Sixty (60) days prior to the start of commercial operations, the project owner shall submit to the County of San Bernardino appropriate fees and plans for review and comment for the construction and operation of the project's sanitary waste septic system and leach field. A copy of these plans shall be submitted to the CPM for review and approval. The plans shall demonstrate compliance with the sanitary waste disposal facility requirements of County of San Bernardino Codes Title 3, Division 3, Chapter 8, Waste Management, Article 5, Liquid Waste Disposal and Title 6, Division 3, Chapter 3, and the Uniform Plumbing Code.

WATER POLICY COMPLIANCE

SOIL&WATER-9 As a conservation method, the applicant shall sequester an amount of its water rights in the project area on an annual basis for the life of the project equal to the amount of water withdrawn. On average, this is expected to be approximately 1,700 AF/y, for which the Applicant owns sufficient water rights. This measure is in addition to the consumption adjustment administered by the Mojave Water Agency. The implementation of this measure will not affect the Watermaster's implementation of the adjudication. The additional water conserved will not count as water produced for purposes of any replacement water obligation.

[Rationale for Edits: As discussed at the April 6, 2010 workshop, the Applicant is proposing this water conservation measure to address Staff's concerns regarding the project's proposed water use in the cooling tower. Although the project's proposed water use complies with applicable LORS, this measure provides additional assurance of compliance.]

Verification: Annual reporting to the Mojave Water Agency will also be provided to the CPM and serve as verification of the applicant's non-use of this quantity of its water rights. ~~Pending agreement on the actions needed to bring the project into compliance with the water policy.~~

REFERENCES

AS2009a - Abengoa Solar Inc. / E. Garcia (TN 52813). Application for Certification for Mojave Solar Project (09-AFC-5), dated 7/2009. Submitted to CEC on 8/10/2009.

AS2009b - Abengoa Solar Inc. / E. Garcia (TN 53375). Data Adequacy Supplement for Mojave Solar Project (09-AFC-5), dated 9/24/2009. Submitted to CEC on 9/24/2009.

BLM2010 – U.S. Bureau of Land Management, BLM Wind and Solar Applications. Website publication: http://www.blm.gov/pgdata/etc/medialib/blm/ca/pdf/pa/energy/wind.Par.5157.File.dat/Renew_Energy_12_09_public_Wind.xlsx and http://www.blm.gov/pgdata/etc/medialib/blm/ca/pdf/pa/energy/solar.Par.15310.File.dat/Renew_Energy_12_09_public_Solar.xlsx, (1/12/2010).

Staff is proposing Condition of Certification **TRANS-1** which would require an alternative park-and-ride location. The intent is make the park-and-ride more effective based upon the location of the construction workforce.

Staff is proposing Condition of Certification **TRANS-2** which would require a construction traffic control plan to be developed and implemented prior to earth moving activities.

Staff is proposing Condition of Certification **TRANS-3** to require the applicant to document and repair pavement damage during the construction period.

Staff is proposing Condition of Certification **TRANS-4** to ensure that the left-turn pocket from SR-58 to Harper Lake Road is lengthened to support the project construction traffic.

Staff is proposing Condition of Certification **TRANS-5** to provide enhanced traffic control during construction for the at-grade railroad crossing near the site.

PROPOSED CONDITIONS OF CERTIFICATION

TRANS-1 Prior to site mobilization activities, the applicant shall find or construct one or more~~a~~ suitable ~~500-space~~ park-and-ride lot(s), with a combined total of 500-spaces, with locations dependant on sources of labor traffic~~to the west of the project site near SR-58~~.

[Rationale for Edits: At this time it is difficult to establish what the exact dispersal of labor and associate traffic distribution. This option offers flexibility for the Applicant to address the intent of the Condition with construction planning information.]

Verification: At least 90 days prior to start of site mobilization, the project owner shall propose ~~a~~ new park-and-ride lot(s) to the County of San Bernardino for review and comment and the Compliance Project Manager (CPM) for review and approval. At least 30 days prior to site mobilization, the project owner shall notify the County of San Bernardino and the CPM that the park-and-ride lot is ready for usage and available for inspection.

TRANS-2 The project owner shall, in coordination with the County of San Bernardino, develop and implement a construction traffic control plan prior to earth moving activities. Specifically, the overall traffic control plan shall include the following:

- Schedule delivery of heavy equipment and building material deliveries, as well as the movement of hazardous materials to the site, including the adjacent lay-down area;
- Coordinate with the County of San Bernardino to mitigate any potential adverse traffic impacts from other proposed construction projects that may occur during the construction phase of AMS; and
- Ensure there is adequate access for emergency vehicles at the AMS site.

The construction traffic control plan shall also include the following for activities of substantial stature:

- Signing, lighting, and traffic control device placement; and
- Temporary travel lane closures and potential need for flaggers.

Verification: At least 60 days prior to start of site mobilization, the applicant shall provide to the County of San Bernardino for review and comment and the CPM for review and approval a copy of the construction traffic control plan. The plan must document consultation with Caltrans.

TRANS-3 Prior to construction, the project owner shall document the existing condition of the primary roadways that will be used by the construction workers and heavy vehicle deliveries along Harper Lake Road to SR-58 and SR-58 for 1000' in each direction from Harper Lake Road. Subsequent to construction, the project owner shall document the condition of these same roadways and either directly reconstruct or reimburse the County of San Bernardino and/or Caltrans for needed repairs.

Verification: At least three months prior to the start of site mobilization, the project owner shall submit a review of existing roadway pavement conditions to San Bernardino County and Caltrans for review and comment and the CPM for review and approval. This review will include photographs and the visual analysis of pavement ~~and sub-surface conditions~~. The CPM will need to approve the summary of existing pavement conditions prior to the commencement of construction.

No later than two months after the end of construction activities, the applicant shall submit an analysis of the roadway pavement conditions to San Bernardino County and Caltrans for review and comment and to the CPM for review and approval. The review will include photographs, the visual analysis of pavement and sub-surface conditions, and a schedule for repair.

After the repairs are completed, the applicant shall submit a letter to San Bernardino County, Caltrans, and the CPM indicating such repairs are finished and ready for inspection.

[Rationale for Edits: Pursuant to discussions at the April 6, 2010 SA Public Meeting, the CEC's intent is for the sub-surface conditions of the road to be evaluated visually, not through testing.]

~~**TRANS-4** Prior to commencing construction activities, the project owner shall lengthen the left-turn pocket on SR-58 at Harper Lake Road to approximately 300 feet (or an alternative length as approved by Caltrans). This condition is necessary to safely accommodate the number of vehicles expected to access the site during peak construction period and will require coordination with, and plan approval by, Caltrans.~~

[Request for reconsideration and removal: During the SA Public Meeting on April 6, 2010, the CEC agreed to confirm whether the Applicant's project alone was prompting the need for the extended left-turn pocket on SR-58 at Harper Lake

Road (to accommodate traffic from the west). Given that the impacts of construction are temporary, this measure seems excessive and controllable by monitoring and rerouting of traffic as needed and based upon conditions experienced during construction.

Considering a majority of the deliveries will come from the Barstow area, the need to extend the turn pocket for traffic from the west was not obvious. If the need for the lengthened left-turn pocket is because of cumulative effects of another project, language should be added to require the projects share costs for the road improvement proportionally.]

Verification: At least six months prior to the start of site mobilization, the project owner shall submit plans to Caltrans for approval and obtain encroachment permit. A copy of the plans and all correspondence to Caltrans shall be simultaneously submitted to the CPM. At least 30 days prior to site mobilization, the improvement shall be completed and subject to inspection by Caltrans. Prior to site mobilization, a copy of Caltrans' approval shall be provided to the CPM.

TRANS-5 During construction, the project owner shall provide flag-men at the approaches to the BNSF rail crossing of Harper Lake Road. These flag-men shall stop vehicles in advance of approaching trains during shift changes and during the transport of hazardous materials. The placement and method for "flagging" approaching vehicles shall be subject to input by BNSF. Additionally, the project owner shall not allow hazardous materials deliveries during non-daylight periods (during both construction and operation) to enhance safety at the rail crossing.

Verification: At least three months prior to site mobilization, the applicant shall inform BNSF of its intent to provide flag-men during the construction period and the hours/duration of their use. The applicant shall take direction from BNSF regarding the proper placement and method to "flag" approaching vehicles. All correspondence to/from BNSF shall be provided to the CPM.

[Rationale for Edits: The referenced BNSF intersection already has train approach warning lights and barricades to alert and block traffic for the purpose of safety at the railroad crossing. To add flag men would be unnecessary. Additionally, deliveries are not affected by the BNSF crossing since for the same reason, it is lighted and with automatic barricades.]

REFERENCES

California Code. Vehicle Code. 2008.

California Code. Streets and Highways Code. 2008.

WORKER SAFETY-2 The project owner shall submit to the CPM a copy of the Project Operations and Maintenance Safety and Health Program containing the following:

- An Operation Injury and Illness Prevention Plan;
- An Operation heat stress protection plan that implements and expands on existing Cal OSHA regulations (8 CCR 3395);
- A Best Management Practices (BMP) for the storage and application of herbicides;
- An Emergency Action Plan;
- Hazardous Materials Management Program;
- Fire Prevention Plan (8 Cal Code Regs. § 3221); and
- Personal Protective Equipment Program (8 Cal Code Regs, §§ 3401—3411).

The Operation Injury and Illness Prevention Plan, Emergency Action Plan, , Heat Stress Protection Plan, BMP for Herbicides, and Personal Protective Equipment Program shall be submitted to the CPM for review and comment concerning compliance of the programs with all applicable safety orders. The Fire Prevention Plan and the Emergency Action Plan shall also be submitted to the San Bernardino County Fire Department for review and comment.

Verification: At least 30 days prior to the start of first-fire or commissioning, the project owner shall submit to the CPM for approval a copy of the Project Operations and Maintenance Safety and Health Program. The project owner shall provide a copy of a letter to the CPM from the San Bernardino County Fire Department stating the fire department's comments on the Operations Fire Prevention Plan and Emergency Action Plan.

WORKER SAFETY-3 The project owner shall provide a site Construction Safety Supervisor (CSS) who, by way of training and/or experience, is knowledgeable of power plant construction activities and relevant laws, ordinances, regulations, and standards; is capable of identifying workplace hazards relating to the construction activities; and has authority to take appropriate action to assure compliance and mitigate hazards. The CSS shall:

- Have overall authority for coordination and implementation of all occupational safety and health practices, policies, and programs;
- Assure that the safety program for the project complies with Cal/OSHA and federal regulations related to power plant projects;
- Assure that all construction and commissioning workers and supervisors receive adequate safety training;
- Complete accident and safety-related incident investigations and emergency response reports for injuries and inform the CPM of safety-related incidents; and

- Assure that all the plans identified in Conditions of Certification Worker Safety-1 and -2 are implemented, though the plans themselves may be administered by someone within the Plant Environment i.e. Plant Safety Representative or Designee

[Rationale for Edits: These edits are proposed solely for clarification.]

Verification: At least 60 days prior to the start of site mobilization, the project owner shall submit to the CPM the name and contact information for the Construction Safety Supervisor (CSS). The contact information of any replacement CSS shall be submitted to the CPM within one business day.

The CSS shall submit in the Monthly Compliance Report a monthly safety inspection report to include:

- Record of all employees trained for that month (all records shall be kept on site for the duration of the project);
- Summary report of safety management actions and safety-related incidents that occurred during the month;
- Report of any continuing or unresolved situations and incidents that may pose danger to life or health; and
- Report of accidents and injuries that occurred during the month.

~~**WORKER SAFETY-4** The project owner shall make payments to the Chief Building Official (CBO) for the services of a Safety Monitor based upon a reasonable fee schedule to be negotiated between the project owner and the CBO. Those services shall be in addition to other work performed by the CBO. The Safety Monitor shall be selected by and report directly to the CBO and will be responsible for verifying that the Construction Safety Supervisor, as required in Condition of Certification Worker Safety-3, and for implementing all appropriate Cal/OSHA and Energy Commission safety requirements. The Safety Monitor shall conduct on-site (including linear facilities) safety inspections at intervals necessary to fulfill those responsibilities.~~

~~**Verification:** At least 60 days prior to the start of construction, the project owner shall provide proof of its agreement to fund the Safety Monitor services to the CPM for review and approval.~~

[Rationale for Edits and request for reconsideration and removal: The Applicant request removal of this condition for the following reason: For construction, the Applicant (project owner) will use an EPC contractor who observes OHSAS 18001 requirements which requires a very proactive HSE program with representation on behalf of the project. Project owner requires a safety person with each Subcontractor and a dedicated full time safety person when each group exceeds 15 people and incremental as designed by our criteria. A Safety Monitor is not necessary to maintain Cal/OSHA and Energy Commission safety requirements. As such, the additioin of a Safety Monitor appears to be an unnecessary cost. Considering that CAL/OSHA has the right to inspect at any time, Applicant is

unclear what function and benefit to the project the Safety Monitor would offer that the CSS, Site Construction Team, and Site Safety Teams could not provide.]

WORKER SAFETY-5 The project owner shall ensure that a portable automatic external defibrillator (AED) is located on site during construction and operations and shall implement a program to ensure that workers are properly trained in its use and that the equipment is properly maintained and functioning at all times. During construction and commissioning, the following persons shall be trained in its use and shall be on site whenever the workers that they supervise are on site: the Construction Project Manager or delegate, the Construction Safety Supervisor or delegate, and all first responders who are certified in first aid and CPR requirements ~~all shift foremen~~. During operations, all power plant employees shall be trained in its use. The training program shall be submitted to the CPM for review and approval.

[Rationale for Edits: The EPC company will have first responders attached to each scope of work who may or may not be the shift foremen. These first responders will be first aid and CPR trained, and receive the additional (AED) training. Each contractor and sub-contractor is required, contractually, to maintain this type of person at the site during any company-related activities.]

Verification: At least 60 days prior to the start of site mobilization, the project owner shall submit to the CPM proof that a portable automatic external defibrillator (AED) has been purchased ~~exists on site~~ and a copy of the training and maintenance program for review and approval. When site mobilization occurs for construction, the project owner shall be able to demonstrate to the CPM that the AED exists on site.

[Rationale for Edits: With no facilities or personnel on site prior to mobilization, the project owner would not be able to comply with the requirement as originally written.]

WORKER SAFETY-6 The project owner shall either (1) reach an agreement with the San Bernardino County Fire Department regarding funding of its project-related share of capital costs to provide appropriate equipment as mitigation of project-related impacts on fire protection, HazMat, and/or EMS services along with an annual payment to maintain and provide these services, **or**, if no agreement can be reached after 60 days of negotiation shall (2) fund its share of the capital costs in an~~the~~ amount to be determined by the CPM following submission of proposals and supporting documents from the project owner and the county. If the amount is determined by the CPM, either the project owner or the county shall have the right to appeal this determination to the Commission. ~~of $350,000 plus provide an annual payment of $100,000 to the SBCFD for the support of additional fire department staff commencing with the date of site mobilization 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 either a copy of the agreement or submit documentation

showing that negotiations failed and that the CPM is empowered to determine the appropriate amount.~~that the $350,000 payment and the first annual payment has been made.~~

In the annual compliance report submitted to the CPM, the project owner shall provide documentation that the annual payment has been made unless an agreement is reached with the KCFD that an annual payment is not required.

[Rationale: By setting a fixed amount in the condition of certification, staff makes reasonable negotiation with the county impossible because the applicant has no incentive to agree to more than the amount and county has no incentive to agree to anything less. Applicant believes it is best to leave the matter to negotiation subject to oversight by the CPM without prejudicing the outcome in this manner.]

WORKER SAFETY-7 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 if pre-site-mobilization sampling indicates Coccidioides immitis is present at the site;

ii) Site monitoring for the presence of Coccidioides immitis in soil before site mobilization and monthly thereafter; and

iii) Implementation of enhanced dust control methods (increased frequency of watering, use of dust suppression chemicals, etc. consistent with **AQ-SC4**) immediately whenever visible dust comes from or onto the site.

After three consecutive months of not finding significant soil levels of Coccidioides immitis, the project owner may ask the CPM to re-evaluate and revise this testing requirement.

[Rationale for Edits: The supporting text indicates that WORKER SAFETY-7 exists to protect workers from Valley Fever. In the April 6, 2010 SA Workshop, discussion led to the proposal of testing one month prior to construction-related ground disturbance, and if no Coccidioides immitis is detected, the mask requirement would be limited to those already contained in OSHA requirements and worker safety plans, or could be reinstituted if a subsequent sampling event show presence of Coccidioides immitis at the site.]

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 and approval.

REFERENCES

AS 2009a- Abengoa Solar Inc. / E. Garcia (tn52813). Application for Certification for Mojave Solar Project (09-AFC-5), dated 7/2009. Submitted to CEC/Docket Unit on 8/10/2009.

STATE OF CALIFORNIA

Energy Resources Conservation
and Development Commission

Application for Certification for the ABENGOA MOJAVE SOLAR POWER PLANT	)	Docket No. 09-AFC-5

PROOF OF SERVICE

I, Karen A. Mitchell, declare that on April 21, 2010, I served the attached *ABENGOA MOJAVE SOLAR PROJECT APPLICANT'S COMMENTS ON STAFF ASSESSMENT* via electronic and U.S. mail to all parties on the attached service list.

I declare under the penalty of perjury that the foregoing is true and correct.

Karen A. Mitchell

SERVICE LIST
09-AFC-5

APPLICANT

Emiliano Garcia Sanz
General Manager
Abengoa Solar Inc.
11500 West 13th Avenue
Lakewood, CO 80215
emiliano.garcia@solar.abengoa.com

Scott D. Frier
Chief Operating Officer
Abengoa Solar Inc.
13911 Park Ave., Ste. 206
Victorville, CA 92392
scott.Frier@solar.abengoa.com

Tandy McMannes
2030 Addison Street, Suite 420
Berkeley, CA 94704
tandy.mcmannes@solar.abengoa.com

APPLICANT'S CONSULTANTS

Frederick H. Redell, PE
Redell Engineering, Inc.
1820 E. Garry Ave., Ste. 116
Santa Ana, CA 92705
fred@redellengineering.com

COUNSEL FOR APPLICANT

Christopher T. Ellison
Ellison, Schneider & Harris
2600 Capitol Ave.
Sacramento, CA 95816
cte@eslawfirm.com

INTERESTED AGENCIES

California ISO
e-recipient@caiso.com

INTERVENORS

California Unions for Reliable Energy
Tanya A. Gulesserian
Marc D. Joseph
Elizabeth Klebaner
Adams Broadwell Joseph & Cardozo
601 Gateway Boulevard, Suite 1000
South San Francisco, CA 94080
tgulesserian@adamsbroadwell.com
eklebaner@adamsbroadwell.com

Luz Solar Partners Ltd., VIII
Luz Solar Partners Ltd., IX
Jennifer Schwartz
700 Universe Blvd
Juno Beach, FL 33408
jennifer.schwartz@nexteraenergy.com

ENERGY COMMISSION

Anthony Eggert
Commissioner and Presiding Member
aeggert@energy.state.ca.us

James D. Boyd
Vice Chairman and Associate Member
jboyd@energy.state.ca.us

Paul Kramer
Hearing Officer
pkramer@energy.state.ca.us

Craig Hoffman
Project Manager
choffman@energy.state.ca.us

Christine Hammond
Staff Counsel
chammond@energy.state.ca.us

Jennifer Jennings
Public Adviser's Office
publicadviser@energy.state.ca.us